

The Psychological Dynamics of Hybrid Work

Exploring the Role of Work Location, Basic Need Satisfaction,
and Contextual Aspects of Telework
in Daily Employee Well-Being

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Abstract

The COVID-19 pandemic has significantly accelerated the adoption of hybrid-work models, where employees regularly alternate between working from home and the office. This shift has transformed telework from an exception to a norm, fundamentally changing the modern work landscape and raising critical questions regarding its psychological implications. Existing research on telework presents mixed findings regarding its impact on employee well-being, highlighting the need to explore the mediating and moderating factors. Given the widespread adoption of hybrid-work models with frequent transitions between work locations, it is also crucial to shift the focus from between-person to within-person effects.

To address these research gaps, this dissertation investigates the within-person effects of hybrid work on employee well-being through three empirical daily diary studies. Drawing on the job demands-resources theory, challenge-hindrance stressor framework, and self-determination theory, this dissertation is guided by three research objectives. First, the direct effects of hybrid work on daily employee outcomes are examined, focusing on within-person variability. Second, the mediating role of basic psychological need satisfaction (autonomy, competence, and relatedness) is explored to explain the relationship between work location and employee well-being. Third, the moderating role of key telework aspects in the hybrid-work context is investigated. These include the time spent teleworking (telework intensity), the prevalence and acceptance of telework within organizations (telework normativeness), and the perceived voluntariness of daily work location choice (daily telework voluntariness), as well as the moderating role of work location in stressor-outcome relationships.

Study 1 examined the direct effect of work location on emotional exhaustion and its indirect effect on perceived performance, using daily diary data from 151 employees ($N = 876$ observations). Multilevel structural equation modeling (MSEM) revealed that employees experienced lower emotional exhaustion and, in turn, higher perceived performance on days when they worked from home compared to days when they worked in the office. Furthermore, telework intensity, telework normativeness, and daily telework voluntariness were examined as potential moderators, reflecting key characteristics of the evolving hybrid work. Conditional indirect effects indicate that these effects were more pronounced when employees rarely worked from home (low telework intensity), belonged to organizations

where telework was uncommon (low telework normativeness), or had limited choice over their work location (low daily telework voluntariness).

Study 2 investigated the mediating mechanisms through which work location affects work engagement and cognitive stress, focusing on the role of basic need satisfaction. Based on daily data from 114 employees ($N = 744$ observations), multilevel mediation models revealed that working from home was associated with higher autonomy- and competence-need satisfaction, which positively affected work engagement and reduced cognitive stress. Conversely, working from home was associated with lower relatedness-need satisfaction, which contributed to increased work engagement and reduced cognitive stress. Multilevel moderated mediation models further indicated that telework normativeness weakened the indirect effects of autonomy- and relatedness-need satisfaction.

Study 3 shifted the focus to the moderating effect of work location on the relationship between time pressure (a challenge stressor), professional isolation (a hindrance stressor), and work engagement and emotional exhaustion. MSEM analysis of daily data from 124 employees ($N = 609$ observations) revealed a significant two-way interaction effect only of work location and professional isolation on emotional exhaustion. As in Studies 1 and 2, this study also explored the moderating role of telework normativeness, revealing significant three-way interactions among work location, telework normativeness, and stressors. These interactions influenced the relationships between time pressure and work engagement and emotional exhaustion, and professional isolation and work engagement, with mixed interaction patterns.

Overall, these studies comprehensively examined the psychological dynamics inherent in hybrid work. The findings underscore the importance of within-person effects and the need to consider both mediating factors, such as basic need satisfaction, and moderating factors, such as telework intensity, normativeness, and voluntariness, in shaping employee outcomes. The practical implications of these findings are significant for organizations navigating the future of work, offering valuable insights into the promotion and design of hybrid-work arrangements. This dissertation highlights the importance of encouraging flexible work arrangements that enhance employees' autonomy and competence while actively mitigating negative effects such as isolation. It is crucial to consider the prevalence of telework within organizations and strike a balance between the advantages of home-based and office-based work to ensure a supportive and productive hybrid-work environment.

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1. General Introduction

Although telework is not a new concept, its significant impact on the global workforce became evident during the COVID-19 pandemic outbreak in March 2020. This crisis accelerated the widespread adoption of hybrid-work models, in which employees alternate between working from home and working in the office (Eurofound, 2022). In the EU, the share of employees engaged in telework increased from 14% in 2019 to 24.2% in 2021, and the level has remained high even after the end of mandatory remote work (Eurofound, 2024). Similarly, a Gallup (2024) study found that the proportion of U.S. employees engaged in hybrid work increased from 27% before the pandemic to 53% afterward. These figures emphasize that telework has become an integral part of the modern work landscape. In the context of ongoing challenges such as skilled labor shortage and climate change, the initial motivations for telework remain relevant. Moreover, as employees have become accustomed to its benefits, telework is expected to persist and likely expand in the long run (Athanasiadou & Theriou, 2021; Rudolph et al., 2021). Thus, given the rapid and substantial changes in work patterns, examining the psychological implications of hybrid-work arrangements is crucial.

Research on telework has yielded conflicting results regarding its impact on employee well-being (Allen et al., 2015; Beckel & Fisher, 2022; Gajendran & Harrison, 2007). This dichotomy can be understood using a dual-pathway approach, which suggests that telework can have both positive and negative effects depending on various factors (Boell et al., 2016; Gajendran et al., 2024). However, previous studies have often failed to examine the mediating and moderating variables that could explain these inconsistencies. Moreover, most research on telework has focused on general differences in outcomes across individuals, rather than intra-individual variations (Biron et al., 2022; Charalampous et al., 2019). Such between-level study designs fail to capture within-person effects that could offer deeper insights into individual experiences of hybrid work (Ohly et al., 2010). As telework has become an everyday practice for many employees, exploring how daily experiences and outcomes vary depending on work location is increasingly important.

Furthermore, the COVID-19 pandemic has fundamentally transformed the telework landscape, necessitating a re-evaluation of earlier findings (Rudolph et al., 2021; Wang et al., 2021). Many studies conducted before or during the pandemic neglected hybrid-work models. Additionally, the

existing research has largely overlooked the moderating role of work location. Although the direct impact of work location on employee outcomes has been explored, few studies have examined how work location influences the relationship between stressors and outcomes (Allen et al., 2015; Rigotti et al., 2024). As employees now have greater flexibility to choose between home and office settings, understanding whether stressors affect employee outcomes differently depending on the work environment is crucial.

In light of these research gaps, this dissertation is based on the following key research questions. First, how does work location affect employee outcomes from a within-person perspective? This question focuses on the direct effect of working from home versus working in the office on employee well-being, considering the daily fluctuations that employees experience in different work settings.

Second, why does work location affect employee outcomes? This question considers the indirect effects between work location and employee outcomes, identifying the mediators that can explain these relationships.

Third, how do the various aspects of telework influence the relationship between work location and employee outcomes? This question seeks to identify the telework aspects that are particularly relevant in hybrid-work contexts, focusing on their moderating roles.

Fourth, how does work location affect the relationship between job stressors and well-being? This question introduces a novel perspective by focusing on the moderating role of work location and examining how stressors relevant to hybrid-work contexts vary depending on whether employees work from home or in the office.

To address these questions, three studies were conducted using a within-person daily diary design. Study 1 compared the within-person variations in emotional exhaustion and the indirect effects of work location on perceived performance through emotional exhaustion when working from home and office. The study also considered how changes in the hybrid-work context, such as telework intensity, normativeness, and daily voluntariness, might moderate these effects.

Study 2 aimed to explain why working from home versus working in the office affects employee outcomes, specifically work engagement and cognitive stress. To this end, the mediating role of basic need satisfaction were examined. Additionally, Study 2 hypothesized that telework normativeness moderates these indirect effects.

Study 3 explored the relationship between location-specific challenge and hindrance stressors (time pressure and professional isolation) and well-being (work engagement and emotional exhaustion). By examining work location as a moderator, the study tested how these relationships vary depending on whether employees work from home or in the office and how telework normativeness influences these location-based differences.

By addressing these research gaps, this dissertation provides a comprehensive understanding of the psychological implications of hybrid-work arrangements in the post-pandemic era. This research not only contributes to the telework literature but also extends theoretical frameworks such as the job demands-resources (JD-R) model, self-determination theory (SDT), and challenge-hindrance stressor framework by applying them to the hybrid-work context. The multifaceted examination of telework, including both its mediating and moderating factors, allows for a more nuanced understanding of its effects. Furthermore, studying hybrid work in the post-pandemic context introduces new theoretical implications, as the nature of hybrid work and its challenges have evolved significantly compared to those in the pre-pandemic telework conditions.

Methodologically, this dissertation advances telework research by employing a within-person daily diary design to gain an in-depth understanding of day-to-day variations in work experiences. Furthermore, by examining the mediating and moderating factors within the same analytical framework, this dissertation establishes a comprehensive model that highlights the complex interplay between telework characteristics and employee well-being. The focus on a well-constructed operationalization of hybrid work and the telework aspects examined ensures that this dissertation's definitions and measurements are robust and applicable across different contexts.

The practical implications are significant for organizations navigating the future of work. Insights into the impact of hybrid work on employee well-being can guide strategies for optimizing telework benefits while addressing its challenges. As telework becomes increasingly vital in organizational practices, these findings will be crucial for creating work environments that support both employee well-being and productivity. Given the positive telework experiences during the pandemic and its expected growth, this dissertation provides timely and relevant insights into how hybrid-work arrangements may shape the future of work.

The following sections lay the theoretical foundation for the studies in this dissertation and are structured as follows. The first chapter provides a review of telework research, identifying key findings and critical issues in the current literature that this dissertation aims to address. The chapter also introduces the psychological theories of JD-R, challenge-hindrance stressor framework, and SDT that guide the conducted studies. The contextual factors of hybrid work, which are examined as moderating variables in this dissertation are also discussed. This chapter concludes with an overview of the research objectives. Chapters 2–4 presents the three empirical studies conducted to address these objectives. The fifth chapter provides a summary and general discussion of the major findings. It outlines the theoretical contributions, describes the strengths and limitations of the empirical studies with suggestions for future research, and practical implications derived from the results. The dissertation concludes with a final summary and reflection.

1.1 From Telework to Hybrid Work

The concept of telework has evolved over time, shaped by technological advancements, changing workforce demographics, and societal demands (Messenger & Gschwind, 2016). The historical development of telework provides insight into its definition and the emergence of hybrid-work models.

The origins of telework can be traced back to the early 1970s, when increased air pollution, traffic congestion, and energy costs led to the avoidance of commuting to work, as reflected in the term *telecommuting* (Nilles, 1975; Tavares, 2017). Over the following decades, telework gained momentum as technological developments made this practice more feasible. The growing popularity of knowledge work, demands of dual careers, and recruitment challenges in urban areas have further fueled the adoption of telework. As a result, the term *telework* was coined to expand its scope beyond its transportation-focused origins to encompass a broader range of work practices outside employers' premises, facilitated by information and communication technologies (Allen et al., 2015; Baruch, 2001; Messenger & Gschwind, 2016). Telework popularity has increased continuously owing to numerous benefits, including increased productivity, greater flexibility, and reduced commuting time. However, telework was largely limited to a select group of employees until the COVID-19 pandemic disrupted the traditional work environment. In March 2020, the pandemic forced the

majority of the global workforce to work from home immediately to minimize the spread of the virus. The positive experience and effectiveness of telework during the pandemic led to a sustained transition to *hybrid-work models*, allowing employees to share their work time between their homes and offices throughout the week (Eurofound, 2022; Rigotti et al., 2020; Rudolph et al., 2021). Although the terms telework and hybrid work are commonly used, an agreed-upon term or universal definition remains lacking. Terms such as *telework*, *telecommuting*, *remote work*, and *distributed work* may be used interchangeably, although they have slightly different meanings (for an overview, see Allen et al., 2015; Eurofound, 2022). In the context of the three studies in this dissertation, the term *telework* refers to working from home as a regular part of a hybrid-work model. To define the scope of hybrid work, the focus is on working from home (home-based telework) in comparison to working in the office on an employer's premises (office-based work). Consequently, self-employed workers and days of remote work at locations other than home (also known as mobile work) were excluded in this context.

When describing and discussing telework research findings in this dissertation, the terms *telework* and *working from home* are used, although the original research may have used different terminology.

1.1.1 The Positives and Negatives of Telework

Despite its popularity, there is ongoing debate about how telework affects employees' well-being and organizational outcomes (Allen et al., 2015; Beckel & Fisher, 2022; Charalampous et al., 2019). Although Gajendran and Harrison (2007) concluded in their meta-analysis that "telework is rather a good than a bad thing" (p. 1538), the literature on the impact of telework remains inconclusive (for an overview, see Allen et al., 2015; Beauregard et al., 2019; Charalampous et al., 2019). This section summarizes the frequently reported findings on the advantages and disadvantages of telework.

The most widely recognized advantage of telework is increased autonomy (Beckel & Fisher, 2022; Gajendran et al., 2024). With greater control over their work schedules, employees can better match their work with their energy levels and availability (Nakrošienė et al., 2019). The freedom to choose the location that best suits their tasks and needs not only enhances productivity but also helps to manage job and private demands, such as mental strain, time pressure, and childcare (Beauregard et al., 2019).

Additionally, the time saved from commuting can be used for recreation and physical activities, which promote well-being, or reinvested into work, which increases productivity. Moreover, home settings provide fewer distracting environments than traditional office settings. With fewer interruptions and background noise, teleworkers can maintain higher levels of focus and concentration, further increasing their productivity (ter Hoeven & van Zoonen, 2015; Wöhrmann & Ebner, 2021). These benefits lead to greater job satisfaction, reduced stress, and improved performance (Beauregard et al., 2019; Jamal et al., 2021).

However, these advantages come with downsides, known as the telework paradox (Boell et al., 2016; Gajendran & Harrison, 2007). For example, increased flexibility and improved work-life balance can blur work-life boundaries, potentially leading to more work-life conflict and longer work hours (Boell et al., 2016). In addition, fewer distractions and interruptions can mean less communication and spontaneous interactions with colleagues (Nakrošienė et al., 2019). Virtual communication, which is often more formal and task-oriented, lacks the richness of face-to-face interactions (Golden et al., 2008). Physical separation from the office reduces social support and opportunities for feedback, which are crucial resources for well-being (Sardeshmukh et al., 2012). All these factors can lead to feelings of isolation—a major challenge in telework. Furthermore, lack of exposure can have a long-term impact on career opportunities (Golden & Eddleston, 2020).

Despite the mixed findings, most studies suggest that the benefits of telework outweigh its drawbacks, particularly in terms of performance, job satisfaction, and reduced stress. A recent meta-analysis by Gajendran et al. (2024) reaffirmed these positive, albeit minimal, effects on employee outcomes (i.e., job satisfaction, organizational commitment and support, performance, and turnover intention). Their findings support a dual-pathway model in which autonomy and isolation act as key mediators, providing evidence of opposing mediating mechanisms that lead to conflicting results (ter Hoeven & van Zoonen, 2015).

In summary, inconsistent findings in telework research underline the complex interplay between telework characteristics and outcomes, influenced by numerous factors. Although telework holds both advantages and disadvantages, its intricacies remain limitedly understood (Beckel & Fisher, 2022). The following section discusses the critical aspects of research on telework that help resolve these inconsistent findings.

1.1.2 Critical Discussion on Telework Research

Despite the extensive research on telework, four critical aspects have emerged in many previous studies. First, the lack of theoretical foundations to guide the development of conceptual research models or the interpretation of findings, especially in the infancy of telework research. Studies have often examined isolated advantages and disadvantages of telework without grounding their hypotheses within a theoretical framework (Bélanger et al., 2013; van Steenbergen et al., 2018). Moreover, researchers have used inconsistent terminologies, conceptualizations, and measures of telework, thus limiting the comparability of the study results (Allen et al., 2015; de Menezes & Kelliher, 2011). Although some researchers have attempted to develop models to explain the relationship between telework factors and outcomes, these models have (thus far) not gained widespread acceptance (e.g., Beckel & Fisher, 2022; Bélanger et al., 2013; Nakrošienė et al., 2019).

Second, the predominant use of cross-sectional studies that focus on the differences between persons by comparing teleworkers to non-teleworkers or high-intensity teleworkers to low-intensity teleworkers (Allen et al., 2015; Gajendran & Harrison, 2007; Vega et al., 2015). The inclusion of telework intensity as a continuous variable represents a significant progress toward elucidating the mixed results, as full-time telework may have detrimental effects. This finding was underlined by studies demonstrating a curvilinear relationship between telework intensity and job satisfaction (Allen, 2015; Golden & Veiga, 2005; Virick et al., 2010). However, between-person studies have failed to capture within-person differences between days working from home and days working in the office. Given that employees often move between these locations, investigating within-person changes in well-being as a function of work location is imperative, regardless of the overall levels of telework intensity and well-being. For example, employees may experience greater job satisfaction when working from home because of increased flexibility and fewer distractions. However, these positive effects may not apply to office days. Between-person studies that have only considered the average ratings of job satisfaction have overlooked these within-person differences, which do not necessarily translate into between-person differences (Biron & van Veldhoven, 2016; Delanoeije & Verbruggen, 2020; Vega et al., 2015). Consequently, within-person studies have gained prominence in recent years. These studies have also shown predominantly positive effects of

working from home such as more positive and less negative affect (Anderson et al., 2015), less need for recovery, and improved concentration (Biron et al., 2022), reduced work-to-home conflict, decreased stress, and increased engagement and performance (Delanoeije & Verbrugge, 2020). Darouei and Pluut (2021) found that reduced time pressure leads to less work-family conflict, which, in turn, enhances work engagement and decreases emotional exhaustion the following day. Moreover, Müller and Niessen (2019) highlighted that autonomy facilitates self-leadership, ultimately contributing to higher job satisfaction. Conversely, de Vries et al. (2019) showed that working from home can result in less organizational commitment and increased professional isolation. Using diary methods with repeated measures of the same variables, these studies capture daily fluctuations and reveal within-person changes across work locations. Diary studies offer additional advantages over cross-sectional designs by providing more accurate data collected in a natural setting and in real time, thus reducing recall bias (Bolger et al., 2003). Furthermore, within-person analyses can isolate the effects of work locations within employees, thereby controlling for individual differences in person- or job-related characteristics (Ohly et al., 2010; Pindek et al., 2019).

Third, the mediating mechanisms in which telework antecedents affect outcomes have been limitedly explored. Existing research shows that telework characteristics can have both positive and negative effects, highlighting the possibility of countervailing effects as further explanation for the conflicting or null findings. Ter Hoeven and van Zoonen (2015) introduced these mechanisms as “opposing mediation [that] can undermine the finding of direct relationships when influences countervail one another. In other words, it is possible that a direct effect is near zero when two indirect effects that are approximately equal in size work in opposite directions” (p. 238). For example, telework may increase autonomy, which promotes job satisfaction; however, it may also intensify isolation, which decreases job satisfaction (Allen et al., 2015; Gajendran et al., 2024). Therefore, the telework characteristics associated with each work location as mediating variables must be further examined and the strength of these indirect effects must be quantified to determine the countervailing effects.

Finally, telework effectiveness is influenced by a multitude of contextual factors that are often overlooked in research (Allen et al., 2015). These factors can be broadly categorized as a) individual characteristics such as gender, personality, and family-home situation; b) job

characteristics such as type of job, tasks, and workplace; c) team and leadership aspects such as team cohesion, social interaction, and leadership style; d) organizational factors such as culture, company policies, and technological infrastructure; and e) telework aspects such as attitude, intensity, and voluntariness (Athanasidou & Theriou, 2021; Baruch & Nicholson, 1997; Golden, 2009; Lunde et al., 2022). Ignoring these contextual factors may contribute to the conflicting research findings, highlighting the need for further investigation.

The significant shift to hybrid-work arrangements during the COVID-19 pandemic may have altered the nature of some of these factors (Kniffin et al., 2021; Rudolph et al., 2021). Employees' added flexibility in choosing their work location on a daily basis introduces another important, but underexplored, contextual factor: the workplace itself. Limited research has addressed how working from home or the office affects the relationships between job characteristics and outcomes. Thus, understanding the impact of work location on these outcomes is crucial in the hybrid-work context.

1.2 Explaining the Impact of Hybrid Work

To address the shortcomings of the existing research that lacks a guiding theory and explain the potential counterbalancing effects on telework outcomes through mediating mechanisms, this research is based on the JD-R model (Bakker et al., 2023; Demerouti et al., 2001), challenge-hindrance stressor framework (Cavanaugh et al., 2000), and SDT (Ryan & Deci, 2000). An overview of these theories is presented in the following sections.

1.2.1 Job Demands-Resources Theory and Challenge-Hindrance Stressor Framework

The JD-R (Demerouti et al., 2001) theory is well recognized in organizational psychology that integrates diverse perspectives on job stress and motivation (Bakker et al., 2023). The theory provides a comprehensive framework to help understand how the physical, social, and psychological characteristics of job and work environments influence employee well-being and organizational outcomes (Bakker et al., 2023; Demerouti et al., 2001). The JD-R theory classifies job characteristics into two distinct categories: job demands and job resources. Job demands refer to the unfavorable aspects of a job that require effort and skills and thus are associated with physiological and psychological costs. Examples of job

demands include work pressure, role ambiguity, and conflict. By contrast, job resources are favorable aspects of a job, facilitating goal achievement, personal growth, learning, and development, and they can serve as a buffer against job demands. Examples of job resources include autonomy, social support, and feedback (Schaufeli & Taris, 2014). Job demands can activate an energy-depleting health-impairment process, leading to job strain, exhaustion, and health problems, whereas job resources can activate a motivational process that fosters work engagement and subsequent positive outcomes (Bakker et al., 2023). Crucially, these processes also influence job performance: the health-impairment process negatively impacts performance, whereas the motivational process positively impacts performance (Bakker & Demerouti, 2017). The dual pathway of job demands and resources have been well studied, with meta-analytic evidence supporting the relationship between job demands and burnout or exhaustion and between job resources and work engagement (e.g., Crawford et al., 2010; Lesener et al., 2019; Mazzetti et al., 2021; Nahrgang et al., 2011).

Nonetheless, some job demands are not only health-impairing but also have motivational potential (Crawford et al., 2010; LePine et al., 2005). The challenge-hindrance stressor framework (Cavanaugh et al., 2000) can explain these inconsistencies, providing a nuanced understanding of the effects of two types of job demands: challenge and hindrance demands. Challenge demands (e.g., time pressure, workload, job responsibility) trigger positive emotions when individuals expect to successfully manage these demands, leading to mastery, personal development, and motivational gains, ultimately resulting in work engagement. By contrast, hindrance demands (e.g., role conflict, organizational politics, and hassles) are perceived as stressful and frustrating, hindering work goals achievement, learning, and optimal functioning (Crawford et al., 2010; Podsakoff et al., 2023). However, both challenge and hindrance demands require energy and resources, potentially leading to strain and exhaustion.

Despite the specific characteristics of organizations and their jobs, the JD-R theory is flexible in explaining the impact of job characteristics across different work contexts and occupations given their unique strain-based and motivational effects (Bakker & Demerouti, 2017; Bakker et al., 2023). As work locations may have different quantities and qualities of job demands and resources (Rigotti et al., 2024), the JD-R theory can effectively examine the relationship between hybrid work and employee outcomes. The advantages and disadvantages of telework are modeled as job resources and

job demands and then integrated into a theoretical model that explains how telework-related job characteristics affect well-being (ter Hoeven & van Zoonen, 2015). For example, although home-based workplace provides autonomy and schedule flexibility as job resources, it comes with isolation as a job demand. Conversely, an office-based workplace is characterized by time pressure and interruptions as job demands but offers social interactions and support as job resources (Gajendran et al., 2024; Sardeshmukh et al., 2012). Based on these examples, the counterbalancing effects can occur not only between working from home and working in the office but also within each work location.

This dissertation contributes to the existing research by integrating the JD-R model to examine the direct effects of hybrid work on employee well-being and the indirect effects on performance. Although employees may face certain demands when working from home, empirical evidence suggests that the advantages of job resources and decreased job demands are predominant compared with office work, with autonomy playing a key role (Beckel & Fisher, 2022; Gajendran & Harrison, 2007). Therefore, Study 1 hypothesized that working from home, compared with working in the office, is negatively associated with emotional exhaustion and indirectly positively associated with perceived performance. The JD-R and challenge-hindrance stressor framework also serve as theoretical foundations for Study 3. In contrast to Study 1, work location was not examined as a predictor but rather as a moderator. Instead, drawing on the challenge-hindrance stressor framework, time pressure and professional isolation are employed as predictors of work engagement and emotional exhaustion to account for the effects of location-specific challenge and hindrance demands. All three studies simultaneously examined positive (perceived performance and work engagement) and negative (cognitive stress and emotional exhaustion) outcomes to test the dual pathway proposed in the JD-R theory.

1.2.2 Self-Determination Theory and Basic Need Satisfaction

Researchers have used the SDT, specifically its mini theory of basic psychological needs, to elucidate the psychological mechanisms underlying the relationships between job demands or resources and outcomes (Albrecht, 2015; Schaufeli & Taris, 2014; van den Broeck et al., 2008; Vansteenkiste et al., 2010). Aligned with this approach, this dissertation

employs the SDT to explain the mediating role of basic need satisfaction in the hybrid-work context (Study 2).

The SDT is a well-established theory of human motivation that posits that the satisfaction of three basic psychological needs—autonomy, competence, and relatedness—is essential for psychological health, development, and well-being (Deci & Ryan, 2000; Ryan & Deci, 2000). The need for autonomy refers to the experience of volition and perceived control over one’s actions; the need for competence involves the experience of mastery and effectiveness in one’s pursuits; and the need for relatedness refers to a sense of acceptance, connection, and belonging to others (Deci & Ryan, 2000; Vansteenkiste et al., 2010). Research has consistently confirmed the relationship between well-being and the satisfaction of these basic needs, regardless of their sociodemographic factors, cultural contexts, or intensity, underscoring their innate and universal nature (Chen et al., 2015; Vansteenkiste et al., 2010).

Research integrating basic psychological need satisfaction into the JD-R model has shown that job demands can lead to negative outcomes and ill-being through a lack of basic need satisfaction, whereas job resources satisfy basic needs and, in turn, lead to positive outcomes and well-being (Bakker & Demerouti, 2017). Meta-analyses and diary studies support this mediating effect of need satisfaction (Coxen et al., 2023; Ng et al., 2012; Ryan et al., 2022; van den Broeck et al., 2016).

Despite their universality, needs are context-responsive and vary daily within individuals, making them particularly relevant in the context of hybrid arrangements (Coxen et al., 2021). Considering the inherent differences between home and office settings, hybrid work affects the degree to which needs are satisfied. The social environment, a crucial factor in fulfilling basic needs, is likely to differ significantly between home and office workplaces, influencing overall need satisfaction (Ryan et al., 2022).

As autonomy is one of the key benefits of working from home, doing so evidently satisfies the need for autonomy more effectively than working in the office. Characteristics of the home setting, such as flexibility and control over tasks, schedules, and the work environment, contribute to a sense of behavior ownership and are likely reflected in employees’ need satisfaction (Deci & Ryan, 2000; Gagné et al., 2022). Moreover, the time saved from commuting enhances autonomy, allowing for more control over personal time and activities (Beckel & Fisher, 2022).

By contrast, the need for relatedness is less satisfied when working from home due to a lack of social support, fewer meaningful connections, and feelings of isolation (Golden et al., 2008; van Zoonen & Sivunen, 2021). A diminished social presence leads to reduced contact and communication, leaving employees out of the information loop. Conversely, the office provides more opportunities for meaningful experiences with colleagues and supervisors (Nakrošienė et al., 2019). The extent of telework negatively affects the quality of relationships among colleagues (Wöhrmann & Ebner, 2021). In addition to reduced social resources at home, organizational cues that are important for identification and psychological boundaries within the organization are fewer.

However, empirical evidence regarding the need for competence is less clear. On the one hand, working from home, characterized by fewer disturbances and less time pressure along with job control, provides an environment conducive to focus and efficiency, facilitating successful task accomplishment and skill development (Biron & van Veldhoven, 2016; Sardeshmukh et al., 2012). Consequently, self-efficacy and mastery experiences may contribute to competence-need satisfaction. On the other hand, working from home hinders opportunities for immediate feedback and effective interaction with the environment, which are crucial for fulfilling this need (ten Brummelhuis et al., 2012). Despite these potential barriers, research suggests that telework is associated with higher productivity and performance (Delanoeije & Verbruggen, 2020; Martin & MacDonnell, 2012), indicating the underlying satisfaction of competence needs.

Thus far, the mediating role of basic need satisfaction from a within-person perspective in hybrid work settings has remained largely unexplored. Therefore, Study 2 in this dissertation aimed to fill this research gap. On the basis of existing research, Study 2 hypothesized that on days when employees are working from home, the needs for autonomy and competence are more satisfied, whereas the need for relatedness is less satisfied, which, in turn, affects well-being, as indicated by work engagement and cognitive stress.

1.3 Contextual Factors of Hybrid Work

As outlined above, previous research has neglected the contextual factors that may influence the relationship between work location and well-being outcomes. Although some researchers have begun to investigate boundary conditions of telework to explain inconsistent findings (e.g.,

Anderson et al., 2015; Kaluza & van Dick, 2023; Kuruzovich et al., 2021; Virick et al., 2010), the current telework context is different, as hybrid-work arrangements have become the “new normal.” Although these factors can exist at different levels (e.g., person, job, or organization), this dissertation focuses on telework aspects to examine how relationships vary depending on changes in the telework setting.

From a practical perspective, this study identified key aspects of telework that have changed with the widespread adoption of hybrid-work environments triggered by the COVID-19 pandemic. This analysis presents the following three main aspects. First, more employees are spending more time working from home (Eurofound, 2022). Second, telework is no longer limited to highly skilled and trusted employees, and it is increasingly dependent on managerial discretion. Previously, even employees with flexible work arrangements may have had most of their colleagues working full-time in their offices (Allen et al., 2015). Today, hybrid-work models are typically open to all employees who can work remotely, making telework the organizational norm rather than an exception (Eurofound, 2022). Third, once the COVID-19 restrictions enforcing mandatory work from home were lifted, encouraging employees to return to their offices became a challenge for employers. While working in the office was once regarded as standard practice, the pandemic demonstrated that it was not the only viable option. Consequently, employees have developed a preference for working from home and are hesitant to give up its advantages (Rudolph et al., 2021). Therefore, the perspective of telework voluntariness and degree of daily work location choice have changed. In addition, work location itself can be considered a contextual factor. The following sections elaborate on the contextual factors examined in this dissertation.

1.3.1 Telework Aspects as Moderators

The three key telework aspects identified above are summarized as telework intensity, telework normativeness, and daily telework voluntariness.

Telework intensity, or extent, refers to the proportion of time an employee spends working from home (Allen et al., 2015). Whereas early studies on telework treated it as a dichotomous variable, distinguishing between teleworking and not teleworking, recent research has recognized the need to consider the extent of telework (Allen et al., 2015; Gajendran & Harrison, 2007). Gajendran and Harrison (2007) defined low-intensity

teleworkers as those spending one or two days a week teleworking, and high-intensity teleworkers as those spending three days or more teleworking. A common method for measuring telework intensity involves asking participants to report the percentage of time they spend teleworking in a typical week (Golden & Gajendran, 2019; Golden & Veiga, 2005).

Research shows a curvilinear relationship between telework intensity and well-being, indicating that moderate levels of telework lead to more positive outcomes (Vander Elst et al., 2017; Virick et al., 2010). This balance allows employees to reap benefits from both home- and office-based working. Employees can benefit from increased autonomy, flexible schedules, and reduced commuting time from home while maintaining social connections and accessing social support (Beckel & Fisher, 2022). Although most studies have examined telework intensity as a predictor of well-being, few studies on the moderating role of telework intensity have shown that the beneficial and detrimental effects are strengthened as telework intensity increases (Gajendran & Harrison, 2007). Acknowledging that the findings of between-level studies may not directly apply at the within-person level is crucial. From a daily perspective, the experiences of working from home versus office can be assumed as likely to differ depending on whether one works from home for only one or two days a week or almost every day. For low-intensity teleworkers, the advantages of working from home may be more pronounced, whereas high-intensity teleworkers may experience a diminishing novelty effect (Golden & Eddleston, 2020). As telework becomes more normalized and telework intensity increases, perceived distinctions between home and office environments may decrease. This interaction effect was also tested in Study 1.

Telework normativeness reflects the extent to which working from home is considered customary within an organization (Golden & Eddleston, 2020; Golden & Gajendran, 2019). In contrast to telework intensity, which refers to an employee's individual telework level, telework normativeness focuses on the prevalence of telework within an employee's organization. Before the pandemic, when telework was less common, researchers paid limited attention to telework normativeness. However, the widespread adoption of hybrid-work arrangements has increased the acceptance and prevalence of telework within organizations, leading to greater importance and variance in telework normativeness. This dissertation builds on Golden and Eddleston's (2020) measure of telework normativeness, in which

participants reported the percentage of their work unit who regularly teleworked. To increase the accuracy of the studies in the dissertation, participants were instructed to focus on their direct colleagues with whom they collaborate regularly, rather than on the entire work unit. They estimated not only the percentage of their colleagues who teleworked regularly but also the telework intensity of these colleagues. The product of these two values (percentage of teleworking colleagues \times their average telework intensity) represents a measure of telework normativeness.

Telework normativeness is a critical contextual factor that influences organizational culture, attitudes, behaviors, and work processes related to telework. In organizations with lower telework normativeness, working from home is perceived as unique, causing employees to feel privileged when granted the opportunity to telework (Brunelle & Fortin, 2021). Consequently, the benefits of telework are more salient, potentially maximizing its positive effects, compared to high telework normativeness, where the distinction between teleworkers and non-teleworkers is less pronounced (Golden & Gajendran, 2019). Drawing on social exchange theory and the norm of reciprocity (Blau, 1964; Cropanzano & Mitchell, 2005; Gouldner, 1960), employees in low telework normative settings may feel obligated to compensate for the benefits they receive through additional effort and performance. Thus, positive outcomes such as productivity, performance, and job satisfaction could be partially attributed to the exclusivity of telework (Gajendran et al., 2015). However, as telework becomes more normative within an organization, the associated advantages become less prominent, and the sense of reciprocity diminishes.

Furthermore, work environments may change with increasing normativeness (Gagné et al., 2022). For example, demands such as time pressure and distractions may no longer be reduced as meetings and work-related interruptions become more similar to those in the office. On the positive side, organizations with high telework normativeness may exhibit a culture that supports and encourages flexible work arrangements. This may involve establishing or adapting work processes, communication strategies, and tools to facilitate virtual collaboration and successful task accomplishment. Additionally, employees may experience less isolation because of increased virtual interactions and a reduced sense of missing out.

Considering the influence of telework normativeness on within-person effects, the difference between working from home and in the office is expected to diminish with increasing telework normativeness. This

dissertation examines the interaction effect of telework normativeness across all three studies.

Telework voluntariness is defined in this dissertation as the daily choice of work location. Unlike previous studies that primarily focused on whether employees voluntarily engaged in telework (voluntary telework) or were forced to telework (involuntary telework), this perspective emphasizes the ongoing nature of this decision-making process. Studies have consistently shown that, compared to involuntary telework, voluntary telework is associated with more positive outcomes, such as lower turnover intentions, work-to-family conflict, and stress (Kaduk et al., 2019; Kossek et al., 2006; Lapierre et al., 2016). This is likely because voluntary telework provides employees with a greater sense of control and autonomy, which are crucial well-being factors (Karasek, 1979).

The COVID-19 pandemic fundamentally changed the telework landscape, with mandatory work-from-home policies forcing most employees into involuntary telework (Wang et al., 2021). Interestingly, the subsequent adoption of hybrid-work models has created a new dynamic. Employees who have adapted to telework now feel compelled to work in the office. This represents a shift from the pre-pandemic norm, when working in the office was unquestioned and working from home was considered an optional benefit (Allen et al., 2015). Owing to this dynamic, the daily decision regarding where to work has become increasingly relevant and is influenced by several factors that can vary daily. For example, employees may opt for the office when face-to-face collaboration is essential. On other days, company policies, such as a minimum number of in-office days, might require employees to work in the office regardless of task-related considerations. Personal circumstances may also constrain daily telework voluntariness. An employee might find the office environment more conducive for a particular task yet prefer to work from home due to non-work reasons (Babapour Chafi et al., 2022).

When employees lack control over their work location, their sense of autonomy diminishes, which can result in negative outcomes, regardless of whether work is performed at home or in the office (Kossek et al., 2009). However, in practice, employees are more likely to feel forced to work in the office than at home. On days with low telework voluntariness, office settings offer fewer opportunities to compensate for restrictions on autonomy than home settings. Moreover, detrimental behavioral outcomes may be self-induced; for example, employees who are reluctant to work in

the office may subconsciously underperform to meet their own lowered expectations. Conversely, when working from home, the impact of voluntariness may be less pronounced (Kaluza & van Dick, 2023). Feeling obligated to work from home might be perceived as less restrictive as employees can maintain control over their work environment at home (Müller & Niessen, 2019). Consequently, the impact of telework voluntariness may be stronger when working from home than when working in the office. These interaction effects were examined in Study 1.

1.3.2 Work Location as a Moderator

Although work location is often viewed as an antecedent that directly affects employee outcomes, it can also be considered a potential moderator given that the effects of job characteristics can vary depending on the work context (i.e., whether employees work from home or in the office; Morganson et al., 2010; Wang et al., 2021). Given the growing prevalence of hybrid-work arrangements, understanding how work location moderates the relationship between job characteristics and outcomes is becoming increasingly important. Home and office environments differ significantly in terms of the presence or absence of job demands and resources, thereby influencing the impact of job characteristics on employee well-being and organizational outcomes in various ways (Boell et al., 2016; ter Hoeven & van Zoonen, 2015). Depending on the specific characteristic-outcome combination, working from home (compared to the office) might have boosting or buffering effects. From a theoretical standpoint, numerous job demand-outcome combinations exist. To maximize practical and theoretical relevance, this study focused on the relationships between the job demands time pressure and professional isolation and the outcomes work engagement and emotional exhaustion, which are particularly relevant in the hybrid-work context (Bailey & Kurland, 2002; Sardeshmukh et al., 2012).

Drawing on the challenge-hindrance stressor framework integrated into the JD-R theory, working from home might have beneficial moderating effects on the relationship between time pressure or work engagement and emotional exhaustion. Greater autonomy and fewer distractions at home may allow employees to overcome time pressure by successfully completing tasks, thereby strengthening the motivational effects of time pressure (Sardeshmukh et al., 2012; Wöhrmann & Ebner, 2021). Additionally, a quieter home environment could have a buffering effect, making it less exhausting to cope with time pressure owing to increased

opportunities for recovery (Biron & van Veldhoven, 2016). Conversely, working from home may amplify the detrimental effects of professional isolation on work engagement and emotional exhaustion as employees may have fewer social resources available to cope with feelings of isolation (de Vries et al., 2019).

These two-way interactions are examined in Study 3. Assuming that not only the direct effect of work location, as examined in Studies 1 and 2, but also its moderating effect would vary depending on the prevalence and acceptance of telework, three-way interactions, including telework normativeness, were also examined. It is hypothesized that as telework becomes increasingly common, the advantages of working from home may become less pronounced. Consequently, the strengthened relationship between time pressure and work engagement, as well as the weakened relationship between time pressure and emotional exhaustion, may diminish. Conversely, more social resources may be available in environments with high telework normativeness, thereby mitigating the detrimental effects of professional isolation on work engagement and emotional exhaustion.

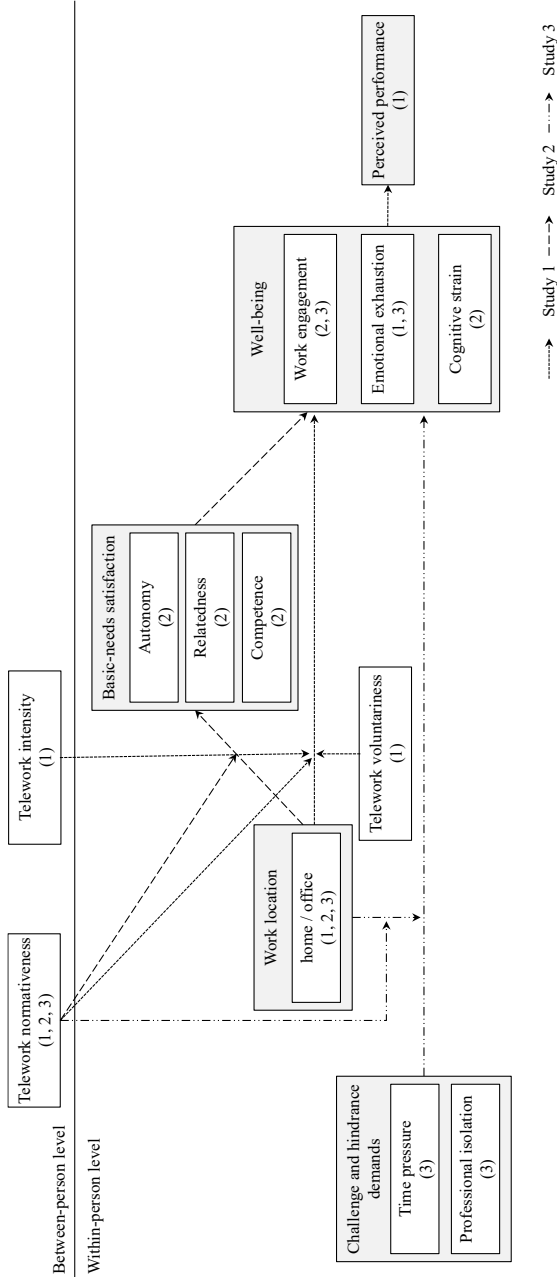
1.4 Overview of the Research Objectives and Research Model

Building on the theoretical foundation and addressing critiques from the previous chapters, I developed conceptual research models to achieve the following research objectives:

- (1) To examine the effects of hybrid work on daily employee outcomes
- (2) To examine the mediating role of basic need satisfaction
- (3) To examine the moderating role of telework aspects: (a) intensity, (b) normativeness, (c) daily voluntariness, and (d) daily work location

An integrated overview of the combined research models is depicted in Figure 1.

Figure 1
 Combined Conceptual Research Models of All Three Studies in this Dissertation



Note. Numbers in parentheses correspond to the studies in which the respective variables were examined.

To address these research objectives, I conducted three empirical diary studies. Study 1 examined the direct and indirect effect of hybrid work on emotional exhaustion and perceived performance, respectively, by comparing days of working from home with days of working in the office, thereby addressing research objective 1. The COVID-19 pandemic has resulted in changes in telework-related aspects, with employees spending more time teleworking, working from home becoming more common in organizations, and free choice of daily work location becoming increasingly important. Accordingly, the study focused on research objectives 3a–c to explore telework intensity, normativeness, and daily voluntariness as moderators in the relationship between work location and emotional exhaustion and therefore the conditional indirect effects.

Study 2 considered research objectives 2 and 3. To elucidate why levels of daily well-being (work engagement and cognitive stress) vary with daily work location, the study examined the mediating role of satisfaction with the basic needs for autonomy, relatedness, and competence. Using a moderated mediation model, the study also tested the conditional indirect effects of telework normativeness.

In Study 3, the focus shifts to investigating daily work location as a moderating variable rather than as a predictor. By examining how the interaction of time pressure and professional isolation (as challenge and hindrance stressors relevant to the hybrid-work context) with daily work location affects daily work engagement and emotional exhaustion, the study addresses research objective 3d. Furthermore, by introducing telework normativeness as a second moderator, the study explored three-way interactions, accounting for research objective 3c.

Table 1 provides an overview of the aims, methodological approaches, and primary results of these studies. The following chapters present the full research articles for each of these three studies.

Table 1
Overview of the Three Studies Included in this Dissertation

	Study 1	Study 2	Study 3
Aim:	To understand the direct effects of daily work location (home versus office) on emotional exhaustion, its indirect effects on perceived performance, and the indirect conditional effects moderated by telework intensity, normativeness, and daily voluntariness in post-pandemic hybrid work settings.	To understand how direct effects of work location on well-being can be explained, this study examined indirect effects of daily work location (home versus office) on work engagement and cognitive stress through basic need satisfaction. Additionally, it examined how telework normativeness might moderate these indirect effects.	This study aimed to understand the effects of two challenge and hindrance stressors in hybrid work, time pressure and professional, on work engagement and emotional exhaustion. It examined the two-way interactions between these stressors and work location, as well as the three-way interactions among the stressors, work location and telework normativeness.
Method:			
<i>Participants:</i>	151 employees, providing 876 daily questionnaires	114 employees, providing 744 daily questionnaires	124 employees, providing 609 daily questionnaires
<i>Design:</i>	Daily diary study with measures at the end of each workday over two workweeks	Daily diary study with measures at the end of each workday over two workweeks	Daily diary study with measures at the end of each workday over two workweeks
<i>Measures:</i>	IV: work location DV: emotional exhaustion, perceived performance MED: emotional exhaustion MOD: telework intensity, telework normativeness (level 1)	IV: work location DV: work engagement, cognitive stress MED: autonomy-, competence-, and relatedness-need satisfaction MOD: telework normativeness (level 2)	IV: time pressure, professional isolation DV: work engagement, emotional exhaustion MOD1: work location MOD2: telework normativeness (level 2)
<i>Data analysis:</i>	Tests for direct, indirect, and conditional indirect effects, using multilevel structural equation models	Tests for indirect and conditional indirect effects, using multilevel structural equation models	<i>Data analysis:</i> Test for direct, two-way, and three-way interaction effects, using multilevel structural equation models
Main results:	Employees reported less emotional exhaustion on days they worked from home compared to days they worked in the office, which, in turn, contributed to higher perceived performance. Telework intensity, normativeness, and daily voluntariness moderated the indirect effects of work location on perceived performance through emotional exhaustion, showing stronger effects at low levels of the moderator variables.	Autonomy- and competence-need satisfaction mediated the beneficial effects of working from home on work engagement and cognitive stress, while relatedness-need satisfaction mediated its detrimental effects. Telework normativeness moderated the indirect effects of autonomy- and relatedness-need satisfaction, indicating that differences between home and office diminish as telework becomes more common in organizations. No significant moderation was found for competence-need satisfaction.	Main results: Time pressure increased both work engagement and emotional exhaustion, whereas professional isolation reduced work engagement and increased emotional exhaustion, confirming their challenge and hindrance effects. The two-way interaction effect with work location was only significant for the relationship between professional isolation and emotional exhaustion. Adding telework normativeness as a moderator revealed significant three-way interactions for the remaining stressor-outcome relationships, although interaction patterns were mixed.

Note: IV = independent variables; DV = dependent variables; MED = mediating variables; MOD = moderating variables.

2. Study 1

How Daily Work Location Affects Employees' Well-Being: The Moderating Role of Telework Intensity, Normativeness, and Daily Voluntariness

2.1 Abstract

Considering the paradigm shift toward hybrid-work models, this daily diary study examined the within-person effects of working from home versus working in the office on well-being and performance. We tested telework intensity, normativeness, and daily voluntariness as potential moderators, reflecting the changing telework landscape characterized by increased telework time, greater organizational acceptance of telework, and enhanced work location flexibility. Data collected from 151 employees across two workweeks (876 observations) were analyzed using multilevel structural equation modeling. The results indicated that employees experienced less emotional exhaustion on home days than on office days, which indirectly improved their performance. Conditional indirect effects showed that these benefits were more pronounced for employees with lower telework intensity, working in low-normativeness settings, or experiencing less daily telework voluntariness. These findings highlight the importance of the intra-individual effects of hybrid work and offer practical guidance for designing flexible work arrangements.

2.2 Introduction

The COVID-19 pandemic has accelerated the shift toward flexible work arrangements, making telework an integral part of the modern workplace (Rudolph et al., 2021; Wang et al., 2021) due to technological advancements and an increasing demand for work-life flexibility (Allen et al., 2015; Messenger & Gschwind, 2016; Vilhelmson & Thulin, 2016). While telework offers benefits such as increased autonomy, and job satisfaction, and reduced commuting stress, it also presents challenges like social isolation, blurred work-life boundaries, and reduced support at work (e.g., Bailey & Kurland, 2002; Baruch, 2000; Beauregard et al., 2019; Felstead & Henseke, 2017; Mann & Holdsworth, 2003) with meta-analytic evidence indicating overall positive yet contextually variable effects

(Gajendran & Harrison, 2007; Kröll et al., 2017; Martin & MacDonnell, 2012).

Despite extensive research on telework, gaps remain in applying frameworks such as the job demands-resources (JD-R) model (Demerouti et al., 2001) to hybrid-work contexts. In addition, most studies rely on static between-person analyses, overlooking dynamic within-person fluctuations between home and office environments (Allen et al., 2015; Wang et al., 2021). The transition from telework as a privilege to hybrid work as a norm (i.e., telework is no longer limited to high-performing and trusted employees) requires a re-evaluation of existing results and an examination of changing contextual factors (Tavares, 2017; Wang et al., 2021).

Consequently, further research is required to understand how qualitative aspects of telework affect the relationship between work location (home versus office) and daily well-being (Beckel & Fisher, 2022; Rudolph et al., 2021). This study addresses these gaps by introducing three key constructs relevant to hybrid work: telework intensity, telework normativeness, and daily voluntariness. While previous research has explored telework intensity and normativeness at an organizational level (Golden & Eddleston, 2020), their influence on intra-individual well-being remains an open question.

Telework intensity refers to the amount or proportion of time spent working from home. We propose that telework intensity moderates the relationship between work location and emotional exhaustion (and, in turn, performance), with low-intensity telework amplifying the benefits of working from home, while high-intensity telework diminishes these differences by reducing the novelty and impact of telework advantages, and increasing the risks of social isolation and resource depletion (e.g., lack of workplace collaboration) (Beauregard et al., 2019; Gajendran & Harrison, 2007). This argument can be related to the JD-R theory by framing telework intensity as a factor that influences the balance between job demands and resources, thereby affecting emotional exhaustion.

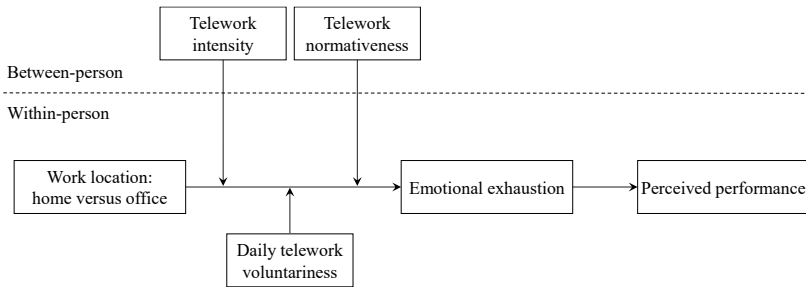
Telework normativeness, or the normalization of working from home within an organization, is framed as a further contextual moderator (Golden & Eddleston, 2020). We suggest that high normativeness could increase social acceptance and support for teleworking, reducing perceived stigma and enhancing access to telework resources (e.g., technology, managerial support). From a JD-R model perspective, this normalization can be seen as a contextual resource, mitigating job demands and enabling smoother transitions between work environments (Bakker et al., 2023). Conversely,

low normativeness could exacerbate demands such as pressure to justify remote work, contributing to higher emotional exhaustion when working from home.

Autonomy, a core resource in the JD-R model, is directly related to daily telework voluntariness—employees' ability to freely choose their work location. When employees can decide where to work, they are more likely to align their work environment with personal needs (e.g., quiet focus at home or collaborative activities in the office). This autonomy reduces job demands like role ambiguity and increases resources like control over work-life balance (Allen et al., 2015). By examining daily telework voluntariness, this study advances autonomy research by emphasizing the flexibility of hybrid-work environments as a dynamic rather than static resource. Traditional applications of the JD-R model have focused on static job characteristics, overlooking the day-to-day variability in job demands and resources inherent in hybrid work (Sonnentag, 2015). By utilizing a daily diary methodology, this research uncovers the dynamic interplay between hybrid work, well-being and performance, offering theoretical insights that static, between-person analyses cannot provide.

We apply JD-R theory (Demerouti et al., 2001) to hybrid work's dynamic nature, uncovering how working from home as compared to working in the office influence well-being and, in turn, performance, resulting in a moderated mediation model, as illustrated in Figure 2. By focusing on telework aspects that have evolved post-pandemic, it advances theoretical understanding, challenges static models, adds to empirical studies conducted during the pandemic (e.g., Abdel Hadi et al., 2021; Shao et al., 2021; Shockley et al., 2021) and offers practical insights for designing flexible work arrangements that promote employee well-being which is important in light of the expected long-term increase in telework (Eurofound, 2022).

Figure 2
Conceptual Research Model



2.3 Theoretical Background

2.3.1 Effects of Hybrid Work From a JD-R Perspective

Before developing our hypotheses, we will first clarify the definitions of telework and hybrid work, as the use of different terminologies and conceptualizations has contributed to inconsistent findings in the telework literature (Baruch, 2001; de Menezes & Kelliher, 2011). As recommended by Allen et al. (2015), we define telework as “a work practice that involves members of an organization substituting a portion of their typical work hours to work away from a central workplace—typically principally from home—using technology to interact with others as needed to conduct work tasks” (p. 44). The term hybrid work, which emerged during the COVID-19 pandemic, refers to a work model that provides employees with the flexibility to work from home or from traditional offices on a regular basis (Eurofound, 2022).

The JD-R model (Demerouti et al., 2001) serves as a valuable framework for understanding the differential effects of job characteristics on well-being across work locations. This model categorizes job characteristics into job demands and resources. Job demands (e.g., work pressure, role ambiguity, and conflict) require effort and are, therefore, associated with physiological and psychological costs, whereas job resources (e.g., social support, autonomy, and performance feedback) can reduce job demands and promote personal growth, learning, and development. Research shows that the quantity and quality of job demands and resources may vary across work settings (Bakker et al., 2023). Thus, the

JD-R model is well suited to the hybrid-work context because certain job characteristics are specific to work location. More specifically, home-based workplaces are characterized by job demands such as isolation and workload, and job resources such as autonomy and work-life balance; by comparison, company-based workplaces are associated with job demands such as time pressure, interruptions, and work-family conflict, and job resources such as feedback and communication (e.g., Beauregard et al., 2019; Beckel & Fisher, 2022; Tavares, 2017; Wöhrmann & Ebner, 2021; Wood et al., 2022). These differences suggest that the JD-R model can serve as a bridge to argue why working from home or the office may have distinct effects on well-being, driven by the specific job demands and resources available in each setting. Table 2 illustrates which job demands and resources are more prevalent in home- and office-based work environments to clarify these distinctions.

Sardeshmukh et al. (2012) were among the first to examine telework within the JD-R framework. They found that telework has motivational effects due to increased autonomy and decreased time pressure and role conflict, as well as health-impairing effects due to increased role ambiguity and decreased support and feedback. Similar studies also suggest that job demands and resources more prevalent at home or in the office may have conflicting effects on organizational and individual outcomes (Boell et al., 2016; Rigotti et al., 2024; ter Hoeven & van Zoonen, 2015; Vander Elst et al., 2017). Overall, the current evidence suggests that the benefits of telework outweigh the drawbacks (Allen et al., 2015; Beckel & Fisher, 2022; Felstead & Henseke, 2017). However, the available results are mainly derived from cross-sectional studies that fail to capture within-person changes as a function of work location (Biron & van Veldhoven, 2016; Ohly et al., 2010) and may not necessarily reveal within-person effects because of the countervailing effects of context-specific job characteristics (Delanoëije & Verbruggen, 2020).

Table 2*Job Demands and Resources in Home and Office Settings*

	Job demands	Job resources
Home setting	<ul style="list-style-type: none"> • Isolation • Workload and work intensification • Blurring boundaries • Role ambiguity 	<ul style="list-style-type: none"> • Autonomy • Schedule flexibility • Customizable work environment • Work-life balance • Reduced commuting time
Office setting	<ul style="list-style-type: none"> • Time pressure • Work-related disturbances and interruptions • Work-family conflict • Role Conflict • Office politics 	<ul style="list-style-type: none"> • Social support • Feedback • Relations with colleagues • Access to communication

Note: This table summarizes job demands and resources identified in empirical studies on home-based and office-based workplaces (e.g., Beauregard et al., 2019; Gajendran et al., 2024; Sardeshmukh et al., 2012; Tavares, 2017). The findings reflect general trends but may vary by study design and context.

2.3.2 Daily Effects of Hybrid Work on Emotional Exhaustion and Performance

To examine how different work locations affect employees' daily well-being, we focus on emotional exhaustion as a negative strain-based indicator of work-related well-being and its indirect influence on perceived performance as a positive outcome. Both outcomes have been well studied in the JD-R literature and have been shown to fluctuate between days (Sonnentag, 2015).

Emotional exhaustion is a core symptom of burnout and defined as “feelings of being emotionally overextended and drained by one's contact with other people” (Leiter & Maslach, 1988, p. 297). Few studies have suggested that telework is associated with reduced emotional exhaustion (Charalampous et al., 2019) and improved psychological health (Kröll et al., 2017). This may be due to of reduced demands at home, the ability to balance work and family responsibilities, and gained resources through

flexibility and saved commuting time (Beauregard et al., 2019; Mann & Holdsworth, 2003). Diary studies further support these suggestions, showing that working from home is associated with a reduced need for recovery, work-to-home conflict, and stress, as well as higher affective well-being (Anderson et al., 2015; Biron & van Veldhoven, 2016; Delanoëje & Verbruggen, 2020; Delanoëje et al., 2019). Darouei and Pluut's (2021) study further highlighted that less time pressure when working from home predicts lower work-family conflict and, subsequently, less emotional exhaustion. However, recognizing that the disadvantages of working from home, such as the loss of social resources and the increase in isolation, can negatively affect emotional exhaustion is crucial (Abdel Hadi et al., 2021; Gajendran et al., 2024; Sardeshmukh et al., 2012). Despite these disadvantages, literature generally suggests a beneficial impact of telework on well-being. This can be attributed primarily to increased autonomy, which has been identified as a key factor that mediates the relationship between telework and well-being (Beckel & Fisher, 2022; Gajendran et al., 2024). Based on Müller and Niessen's (2019) findings of increased autonomy on home days compared to that on office days, we expect the positive effects of telework on well-being to also extend to the within-person level. Building on previous research and the JD-R theory, we hypothesize that emotional exhaustion is lower when working from home.

Hypothesis 1: On days when employees work from home, they experience less emotional exhaustion than when they work in the office.

Performance, defined as effective task execution (Abramis, 1994) is a critical factor in telework. Numerous studies have linked telework to enhanced performance (Gajendran et al., 2015; Martin & MacDonnell, 2012). Telework allows employees to work for longer durations (due to saved commuting time) and with more dedication (Kelliher & Anderson, 2010), reduces office-related pressures, interruptions, and distractions, and enables employees to optimize productivity by customizing their work environments and schedules (Darouei & Pluut, 2021; Sardeshmukh et al., 2012). Diary studies have confirmed these benefits, revealing increased work concentration (Biron & van Veldhoven, 2016), perceived productivity (Hodzic et al., 2024), and job performance (Delanoëje & Verbruggen, 2020; Vega et al., 2015) when working from home. However, while these

studies primarily focus on direct effects, the JD-R model offers a more comprehensive theoretical lens by emphasizing the role of mediating mechanisms (Bakker et al., 2023). Specifically, it posits that job demands and resources indirectly influence performance through their direct effect on employee well-being. Emotional exhaustion, as a key indicator of strain, has been shown to directly impair performance by depleting the energy and focus required for effective task execution (Bakker et al., 2023). Conversely, reducing emotional exhaustion enables employees to allocate their resources more effectively into productive work behaviors, which enhances their performance. In the context of hybrid work, we argue that work location influences performance indirectly through emotional exhaustion. On days when employees work from home, the reduced demands and increased resources lower emotional exhaustion, which, in turn, allows employees to perform at a higher level. This aligns with prior findings suggesting that emotional exhaustion mediates the relationship between job characteristics and performance outcomes (Abdel Hadi et al., 2021; Bakker et al., 2023).

Hypothesis 2: Work location indirectly affects perceived performance through emotional exhaustion, such that on days when employees work from home, they experience higher perceived performance than when they work in the office due to lower emotional exhaustion.

2.3.3 Moderating Role of Telework Aspects in the Hybrid-Work Context

Given the changing context of hybrid work, we identified three telework aspects that potentially moderate the effects of work location on emotional exhaustion: intensity, normativeness, and daily voluntariness.

Telework intensity is the proportion of time spent working from home during a typical workweek. Considering telework intensity, rather than a dichotomous variable (telework versus non-telework), was one of the first advances in telework research because outcomes can vary by intensity level (Allen et al., 2015; Beckel & Fisher, 2022). However, studies on the moderating role of telework intensity are scarce. High-intensity telework has been shown to amplify the negative effects of occupational isolation on performance (Golden et al., 2008), and the positive effects of work-nonwork conflict and of role ambiguity on job stress and strain (Raghuram & Wiesenfeld, 2004; Suh & Lee, 2017). A meta-analysis revealed that high-

intensity telework worsens the quality of relationships between coworkers while accentuating the beneficial effects of reducing work-family conflict (Gajendran & Harrison, 2007). Moderate levels of telework intensity seem to allow employees to take advantage of both work locations (Allen et al., 2015; Beauregard et al., 2019); however, the impact of telework intensity on daily fluctuations in well-being remains unexplored.

When employees work from home one or two days a week, they are more likely to appreciate the benefits of telework on home days, leading to reduced emotional exhaustion on home days than office days (Golden & Eddleston, 2020; Golden & Veiga, 2005). Similarly, they may be less likely to perceive the disadvantages associated with home days, such as isolation, which they consider exceptions that can be compensated for on office days. Conversely, when employees work from home most of the week, the advantages may no longer seem particularly special, potentially attenuating the beneficial effects of working from home on exhaustion, which, in turn, improves performance. Moreover, as high-intensity teleworkers gain more experience in working from home, we expect the differences in the effects between the two work locations to diminish.

Hypothesis 3: Telework intensity moderates the indirect effect of work location on perceived performance through emotional exhaustion, such that the negative effect of working from home (versus in the office) on emotional exhaustion is stronger when telework intensity is low than when it is high.

Telework normativeness indicates the acceptance and prevalence of regular telework within an organization (Golden & Eddleston, 2020). Before the COVID-19 pandemic, hybrid-work models were uncommon and telework was limited to a small group of privileged employees (Felstead et al., 2002). Some researchers have suggested that this telework exclusivity contributed to positive outcomes (Gajendran et al., 2015), and that employees felt obligated to increase productivity to reciprocate the benefits and compensate for the time saved while commuting (Beauregard et al., 2019; Kelliher & Anderson, 2010). Meanwhile, Gajendran et al. (2015) argued that high telework normativeness reduces reciprocity because in this context telework becomes a standard practice rather than a special perk. They found a stronger association between telework intensity, task performance, and autonomy when telework normativeness was low than

when it was high. Building on these insights, we propose that when most colleagues work from home, teleworkers may no longer feel privileged, resulting in diminished telework benefits. Furthermore, virtual meetings, disruptive chat messages, and unlimited work hours are likely to increase, potentially decreasing benefits of telework such as increased autonomy, reduced time pressure, and fewer interruptions (ten Brummelhuis et al., 2012). As a result, both emotional exhaustion and indirectly performance may be affected. Therefore, we hypothesize that the difference in effects between the two work locations decreases as telework normativeness increases.

Hypothesis 4: Telework normativeness moderates the indirect effect of work location on perceived performance through emotional exhaustion, such that the negative effect of working from home (versus in the office) on emotional exhaustion is stronger when telework normativeness is low than when it is high.

Daily telework voluntariness refers to the freedom that employees have to choose their work locations each day. Previous studies have explored the effects of voluntary and involuntary telework between employees. Involuntary telework has been associated with higher turnover intentions, work-to-family conflict, and stress (Kaduk et al., 2019; Lapierre et al., 2016). Similarly, Kossek et al. (2006) found that greater psychological job control, including over work location decisions, was associated with lower turnover intentions, family-to-work conflict, and depression. However, the COVID-19 pandemic altered the relevance of telework voluntariness. Although telework was usually voluntary, it became mandatory during the pandemic. Kaluza and van Dick (2023) showed that employees reported fewer disadvantages with increased telework before the pandemic; however, this changed when telework became mandatory. In a second study, they found that the amount of telework was associated with fewer disadvantages, but only when voluntariness was high. Thus, the emergence of hybrid-work arrangements following the pandemic has introduced a new layer of complexity to the concept of telework voluntariness; specifically, depending on organizational policies, obligations, and employees' private situations and preferences, telework voluntariness can vary daily. For example, employees could be free to

choose where to work on one day but be required to work at their offices on the next day.

Based on insights from cross-sectional studies and the well-established link between job control and well-being (Karasek, 1979), we expect daily telework voluntariness to influence the relationship of work location with emotional exhaustion. In light of the recent debates indicating that employees prefer to work from home (Rudolph et al., 2021), we hypothesize that the impact of daily telework voluntariness is more pronounced on office days than on home days. As the perceived restriction in autonomy might be already greater on office days than on home days (Müller & Niessen, 2019), we argue that the lack of choice might further contribute to increased emotional exhaustion, which leads to lower performance on office days than on home days.

Hypothesis 5: Telework voluntariness moderates the indirect effect of work location on perceived performance through emotional exhaustion, such that the negative effect of working from home (versus in the office) on emotional exhaustion is stronger when employees feel forced to work at their work location than when they have a free choice.

2.4 Methods

2.4.1 Procedure and Sample

In this diary study, participants initially completed a general questionnaire, followed by 10 daily questionnaires at the end of each workday for two weeks. Data were collected online between May and September 2022, a period when working from home was not mandatory in Germany owing to COVID-19 regulations. All participants provided informed consent, and ethical approval for this study was obtained from the university's ethics review committee (2022-JGU-psychEK-S020).

Participants were recruited from Germany through personal and professional networks, social media, and an organization in the financial sector. The eligibility criteria required participants to be employed for at least 19 hours per week in a hybrid-work model. Of the 182 individuals enrolled, 19 were excluded because of ineligibility or incomplete general questionnaires. We then removed invalid daily questionnaires. To reduce recall bias, we included only daily questionnaires completed before

midnight. To robustly test our hypothesis regarding hybrid work by comparing days worked from home and days worked in the office, we included only daily questionnaires from days when participants worked at least 75% of their total time either at home or in the office. This cut-off value ensured that the primary work location was accurately represented while minimizing data loss and confounding effects caused by mixing different work environments. As a result, we excluded 27 (2.8%) daily questionnaires where participants worked exclusively at other locations, and 68 (7%) daily questionnaires where less than 75% of the work hours were spent either at home or in the office. Finally, we excluded 12 participants who did not complete at least one valid daily questionnaire. The final data set comprised 151 participants who provided 876 daily questionnaires, averaging 5.8 questionnaires per person ($SD = 2.47$). Of these, 501 questionnaires reflected days worked entirely from home, and 307 reflected days worked entirely in the office. Therefore, only a small proportion (7.8%) of the remaining daily questionnaires represented days where participants worked between 75% and 100% either at home or in the office.

In the final sample, participants were predominantly women (67.5%), with a mean age of 39.08 years ($SD = 10.35$) and a mean work experience of 16.32 years ($SD = 11.57$). The educational level was relatively high, with 61.6% holding an academic degree and 10.6% holding a doctoral degree. Most participants were employed in the finance and insurance sector (53%), with the remainder representing various businesses from both private and public sectors. The average weekly working time was 39.3 hours ($SD = 7.58$), of which an average of 55.54% was spent working from home ($SD = 18.84\%$). Of the 151 participants, 91 reported that they were satisfied with their current extent of working from home, 58 preferred to work from home more often, and 2 preferred to work from home less.

2.4.2 Measures

Following the recommendations for diary studies, we used single items and shortened scales adapted to the daily context (Ohly et al., 2010). All items were presented in German.

Work location was coded as a dummy variable, whereby 0 = working at the office and 1 = working from home, with a 75% cut-off of the total working time of that day. The participants reported their work locations by indicating the work hours for each of the following options: a) working at the office, defined as the traditional company-based workplace; b) working

from home; and c) other work locations, including business trips or irregular remote work at locations other than home. Based on the above information, we calculated the percentage of total working time spent at each location, which we then dummy coded.

Telework intensity was assessed at the between-person level in the general questionnaire because we were interested in the overall extent of home-based telework. It was calculated as the ratio of the number of hours usually worked from home to the total number of hours worked and ranged from .05 to .99.

Telework normativeness refers to how common it is to work from home at the participant's workplace. It was also assessed at the between-person level in the general questionnaire because it remains stable over two weeks. Building on Golden and Eddleston's (2020) study, we asked participants to estimate the percentage of their direct colleagues who regularly worked from home. To enhance accuracy, participants also estimated the telework intensity of their colleagues (in percentages). We then multiplied the percentage of teleworking colleagues by their average telework intensity, resulting in values ranging between 0 and 1.

Daily telework voluntariness was measured using a single item "How free were you to choose your work location today?" The question was answered on a 5-point Likert scale ranging from 1 (*Today I felt forced to work at my work location*) to 5 (*I was completely free to choose my work location*).

Emotional exhaustion was measured based on the emotional exhaustion subscale of the German version of the Maslach Burnout Inventory (MBI-D; Büssing & Perrar, 1992). The subscale comprised three items, for example: "Today, I felt burned out from my work." Responses were given on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Cronbach's alpha at the within-person level was .74.

Perceived performance was assessed based on three items used in Abramis' (1994) measure of job performance. A sample item was: "In your own judgment, how well did you perform today without mistakes?" Items were answered on a 5-point scale ranging from 1 (*very poorly*) to 5 (*very well*). Cronbach's alpha at the within-person level was .76.

2.4.3 Data Analysis

Given the nested structure of our data, we tested our hypotheses using multilevel structural equation models (MSEM) with Mplus version 7.3

(Muthén & Muthén, 1998-2014). This approach decomposes the variance of level-1 variables into within-person and between-person components (Preacher et al., 2010).

To test direct and indirect effects, we ran an MSEM with work location (person mean centered) as the predictor variable, emotional exhaustion as mediator variable and perceived performance as outcome variable. To test the conditional indirect effects, we introduced telework intensity and telework normativeness as level-2 moderator variables (between-person level) and daily telework voluntariness as level-1 moderator variable (within-person level), employing first-stage moderated mediation models. Moderators were grand mean centered. Owing to the high correlation between the moderator variables (Table 3), we analyzed the interaction effects in three separate models. Prior to the analyses, work location was person-mean centered and the moderator variables were grand-mean centered to help interpret the interaction effects (Enders & Tofighi, 2007). To interpret significant interaction effects, we applied Hayes' (2015) index of moderated mediation and simple slope analysis, using conditional values of the moderator at one standard deviation below, at the mean, and one standard deviation above the mean.

2.5 Results

2.5.1 Descriptive Statistics

Table 3 shows the means, standard deviations, within-level intraclass correlations (1-ICC), and correlations of the study variables. The intraclass correlations of the outcome variables indicated that 48% of the variance in emotional exhaustion and 64% of the variance in performance could be attributed to within-person variations, justifying a multilevel modeling approach.

2.5.2 Hypotheses Testing

Table 4 presents the results of the MSEM. Model 1 examined the direct and indirect effects of work location on emotional exhaustion and perceived performance. Models 2-4 examined the conditional indirect effects of telework intensity, telework normativeness, and daily telework voluntariness. Table 5 provides the indices of moderated mediation and the conditional indirect effects at high, average, and low levels of the moderators.

Hypothesis 1 concerns the direct effects of work location on emotional exhaustion. The results show that employees experienced less emotional exhaustion ($\beta = -.16, p < .001$) on days when they worked from home compared to days when they worked in the office. Thus, Hypothesis 1 is supported.

Hypothesis 2 addressed the indirect effects of work location on perceived performance through emotional exhaustion. The results indicate that emotional exhaustion mediated the effect of work location on emotional exhaustion ($\beta = .06, p < .001$), supporting Hypothesis 2.

Hypothesis 3 proposed that telework intensity would moderate the indirect effects of work location on perceived performance through emotional exhaustion. The index of moderated mediation was significant ($-.21, p = .03$), and simple slope analyses indicated that the indirect effect of work location on performance via exhaustion was stronger when telework intensity was low ($-1\ SD: b = .12, p < .001$) compared to when it was high ($+1\ SD: b = .04, p = .15$). Figure 3 illustrates this interaction pattern. Therefore, Hypothesis 3 is supported.

Hypothesis 4 predicted that telework normativeness would moderate the indirect effects of work location on perceived performance through emotional exhaustion. The index of moderated mediation was significant ($-.20, p = .02$), with a stronger effect for employees working in low-telework normativeness settings ($-1\ SD: b = .12, p < .001$) than for those in high-telework normativeness settings ($+1\ SD: b = .03, p = .16$). Figure 4 depicts the hypothesized effects, supporting Hypothesis 4.

Hypothesis 5 predicted that daily telework voluntariness would moderate the indirect effects of work location on perceived performance through emotional exhaustion. The index of moderated mediation was significant ($-.04, p = .001$). Figure 5 and simple slope analysis confirm that the indirect effect of work location on perceived performance through emotional exhaustion is stronger on days when employees experienced low telework voluntariness ($-1\ SD: b = .08, p = .004$) than on days when they experienced high telework voluntariness ($+1\ SD: b = -.05, p = .10$). Therefore, Hypothesis 5 is supported.

Table 3
Means, Standard Deviations, Within-Level Variances, and Correlations

	<i>M</i>	<i>SD</i>	1-ICC ^a	1	2	3	4	5	6
1. Work location ^b	0.59	0.49	0.87	–			.58***	-.18***	.18**
2. Telework intensity	0.56	0.19		.95*** ^c	–				
3. Telework normativeness	0.52	0.21		.52*** ^c	.60***	–			
4. Daily telework voluntariness	3.54	1.50	0.64	.33**	.37***	.24*	–	-.25***	.19**
5. Emotional exhaustion	2.53	1.41	0.48	-.27*	-.15	.01	-.10	–	-.39***
6. Perceived performance	3.97	0.69	0.64	.29*	.17*	-.02	-.05	-.56***	–

Note: Correlations above the diagonal are within-person (level-1) correlations ($N = 876$). Correlations below the diagonal are between-person (level-2) correlations ($N = 151$).

^a ICC = intraclass correlation coefficient (= variance at between level / (variance at within level + variance at between level)). 1-ICC refers to the percentage of the within-person variance.

^b Work location: 0 = working at the office, 1 = working from home.

^c please note that correlations are based on uncentered variables. For testing our hypotheses, we person-mean centered work location, resulting in a zero correlation between work location and telework intensity as well as telework normativeness

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4*Results of the Multilevel Structural Equation Models*

	Emotional exhaustion		Perceived performance	
	β	SE	β	SE
Model 1: Hypothesis 1+2				
Work location ^a	-.16***	.03	.11**	.03
Emotional exhaustion			-.37***	.03
Work location → emotional exhaustion			.06***	.01
Model 2: Hypothesis 3				
Work location	-.16***	.03	.11**	.03
Emotional exhaustion			-.37***	.03
Work location → emotional exhaustion			.06***	.01
Telework intensity	-.15	.09		
Work location x telework intensity	.07***	.03		
Model 3: Hypothesis 4				
Work location	-.16***	.03	.11**	.03
Emotional exhaustion			-.37***	.03
Work location → emotional exhaustion			.06***	.01
Telework normativeness	.02	.09		
Work location x telework normativeness	.08*	.03		
Model 4: Hypothesis 5				
Work location	-.03	.04	.11**	.03
Emotional exhaustion			-.37***	.03
Work location → emotional exhaustion			.01	.02
Telework voluntariness	-.20***	.04		
Work location x daily telework voluntariness	.12**	.04		

Note: $N = 876$ days (151 employees); β = standardized estimate; SE = standard error.

^a Work location: 0 = working at the office, 1 = working from home.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 5*Results of the Conditional Indirect Effects via Emotional Exhaustion*

		Perceived performance		
Conditional indirect effects		<i>B</i>	<i>SE</i>	<i>95% CI</i>
IMM: Telework intensity		-.21*	.10	<i>[-.40, -.02]</i>
	-1 <i>SD</i>	.12***	.03	<i> [.06, .17]</i>
	<i>M</i>	.08***	.02	<i> [.04, .11]</i>
	+1 <i>SD</i>	.04	.03	<i> [-.01, .08]</i>
IMM: Telework normativeness		-.20*	.08	<i> [-.36, -.04]</i>
	-1 <i>SD</i>	.12***	.03	<i> [.06, .17]</i>
	<i>M</i>	.08***	.02	<i> [.04, .11]</i>
	+1 <i>SD</i>	.03	.02	<i> [-.01, .08]</i>
IMM: Daily telework voluntariness		-.04**	.02	<i> [-.07, -.02]</i>
	-1 <i>SD</i>	.08**	.03	<i> [.03, .13]</i>
	<i>M</i>	.02	.02	<i> [-.02, .05]</i>
	+1 <i>SD</i>	-.05	.03	<i> [-.10, .01]</i>

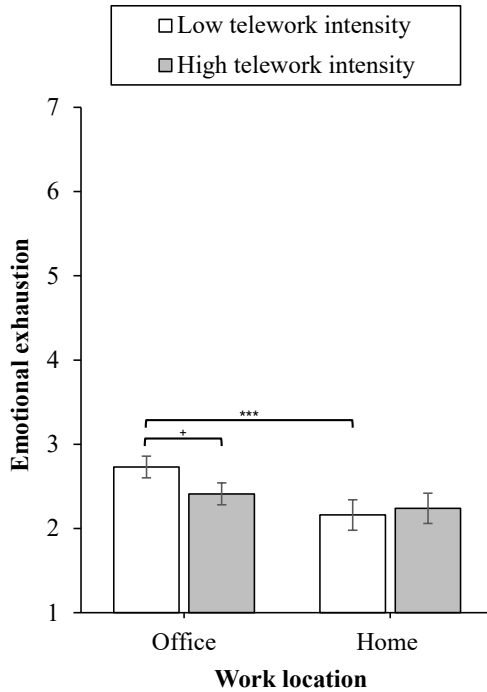
Note: $N = 876$ days (151 employees); IMM = Index of the moderated mediation effect with work location (level 1) as a predictor, emotional exhaustion (level 1) as a mediator, and telework intensity (level 2), telework normativeness (level 2) and daily telework voluntariness (level 1) as moderators; conditional indirect effects at high (+1 *SD* = standard deviation), average (M = mean) and low (-1 *SD*) values of the moderator; B = unstandardized estimate; SE = standard error; CI = confidence interval, values presented in italics indicate that the CI excludes zero.

^a Work location: 0 = working at the office, 1 = working from home.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Figure 3

Cross-Level Interaction of Work Location (Home versus Office) with Telework Intensity on Emotional Exhaustion

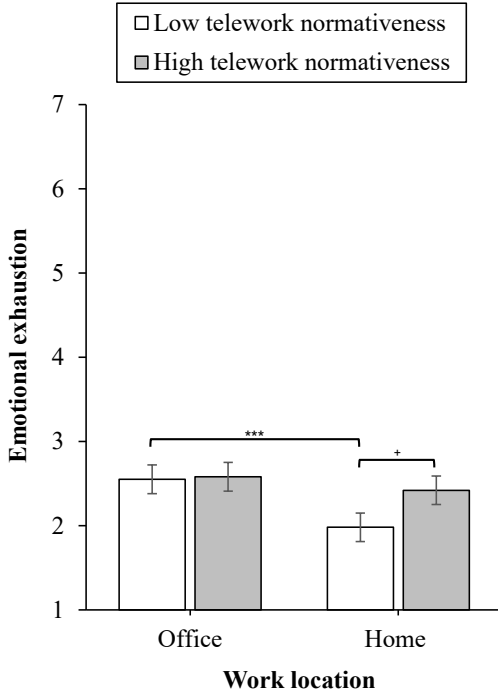


Note: Error bars indicate standard errors.

⁺ $p < .10$, *** $p < .001$.

Figure 4

Cross-Level Interaction of Work Location (Home versus Office) with Telework Normativeness on Emotional Exhaustion

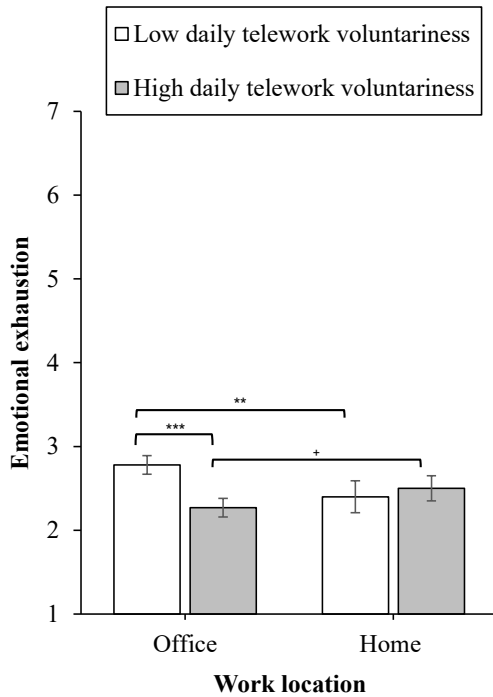


Note: Error bars indicate standard errors.

⁺ $p < .10$, ^{***} $p < .001$.

Figure 5

Within-Level interaction of Work Location (Home versus Office) with Daily Telework Voluntariness on Emotional Exhaustion



Note: Error bars indicate standard errors.

⁺ $p < .10$, ^{**} $p < .05$, ^{***} $p < .001$.

2.6 Discussion

This daily diary study examined the relationships between hybrid work, emotional exhaustion, and, in turn, perceived performance. Our findings revealed that employees reported lower emotional exhaustion and, in turn, higher performance on days working from home than on days working in the office. To account for the new hybrid-work context, we examined the moderating effects of telework intensity, telework normativeness, and daily telework voluntariness. As hypothesized, employees who rarely worked from home (low telework intensity), belonged to organizations in which telework was uncommon (low telework normativeness), or had less freedom to choose where to work (low daily telework voluntariness) experienced a more significant difference in their exhaustion levels between home and office days. These differences resulted in more pronounced indirect effects of work location on performance, mediated by exhaustion compared to those with higher telework intensity, normativeness, and daily voluntariness.

2.6.1 Theoretical Implications

Our research contributes to the understanding of the daily effects of hybrid work on emotional exhaustion and perceived performance, particularly in the altered conditions following the COVID-19 pandemic. Using a within-person design with a large sample size (Preacher et al., 2010), we provide a detailed examination of daily fluctuations in work location and well-being outcomes, offering insights that go beyond cross-sectional studies. Our findings confirm the benefits of working from home on emotional exhaustion and performance in the post-pandemic context, underscoring the value of studying hybrid work through a within-person lens, adding to previous research (Darouei & Pluut, 2021; Delanoeije & Verbruggen, 2020; Vega et al., 2015).

Our results suggest that the difference in emotional exhaustion levels between home and office days diminishes as telework intensity and normativeness increase. In other words, while employees who work primarily from home or in settings with high telework normativeness experience the same level of exhaustion on both home and on office days, their counterparts experience less exhaustion on home days than on office days. Notably, low- and high-intensity teleworkers differed significantly in their levels of exhaustion when working in the office, but not when working

from home (Figure 3). By contrast, the difference between low and high normativeness was more evident in the home setting (Figure 4). This indicates that the detrimental effects of working in the office are more pronounced when telework intensity is low, and the beneficial effects of working from home are more pronounced when telework normativeness is low. Future studies should build on these findings to elucidate the underlying mechanisms.

Introducing daily telework voluntariness as a moderator offers a novel perspective, revealing that low voluntariness intensifies differences in emotional exhaustion and performance between home and office days, particularly on office days. The substantial daily variation in telework voluntariness in our sample (1-ICC = 64%; Table 3) justifies our examination of this aspect and demonstrates the importance of future studies considering this variable. This reflects a recent shift, as employees accustomed to pandemic-era flexibility (Rudolph et al., 2021) may now experience reduced job control when compelled to work in the office, with adverse effects on well-being and performance (Kaluza & van Dick, 2023). Conversely, choosing to work in the office appears to leverage its social and collaborative advantages, improving outcomes.

This study extends the JD-R theory by highlighting how dynamic work arrangements, such as hybrid work, necessitate a more nuanced understanding of the interplay between job demands, resources, and well-being. Specifically, our findings emphasize the importance of incorporating situational and contextual moderators, such as telework intensity, normativeness, and daily voluntariness, into the JD-R framework. These factors influence the balance between demands (e.g., isolation, role ambiguity) and resources (e.g., autonomy, social support) in hybrid-work contexts, showing that both demands and resources are not static but fluctuate based on daily work locations and contextual factors.

By demonstrating that telework intensity and normativeness moderate the impact of work location on emotional exhaustion, we add nuance to between person-studies (Allen et al., 2015; Gajendran & Harrison, 2007; Golden & Eddleston, 2020) and challenge the traditional static application of the JD-R model, advocating for its adaptation to account for within-person variability. Furthermore, the introduction of daily telework voluntariness as a moderator extends the theory by underscoring the critical role of autonomy as a dynamic, day-to-day resource, which can mitigate the adverse effects of perceived restrictions on emotional exhaustion and

performance. These findings encourage a re-evaluation of JD-R assumptions, suggesting that future theoretical advancements should integrate the temporal and situational variability inherent in modern hybrid-work environments.

Overall, our findings provide a more nuanced understanding of the dynamics of the emerging hybrid-work arrangements. We developed our hypotheses by integrating relevant findings on job demands and resources related to work locations (e.g. Gajendran et al., 2024; Sardeshmukh et al., 2012; Tavares, 2017). Although we could not directly test the mediating mechanisms of job demands and resources on the relationship between work location and well-being, we highlighted the importance of within-person studies, the potential conflicting effects of location-specific characteristics, and telework aspects (intensity, normativeness, and daily voluntariness) as contextual factors. Additionally, we make a novel contribution by examining the indirect effects of emotional exhaustion on performance, offering a deeper understanding of how work location impacts both well-being and performance. We encourage future studies to use our theoretical foundation to examine the intricacies of the effects of hybrid-work arrangements on employees' daily well-being as well as performance.

2.6.2 Limitations and Suggestions for Future Research

In the following, we identify several areas for further investigations, which are related to our study's limitations. First, our sample may have been subject to selection bias. On the one hand, employees who engage in telework may differ from those in jobs unsuitable for telework or who are uninterested in it, which is likely to cause confounding effects. Although this bias has been recognized as a major limitation in previous studies (Delanoeije & Verbruggen, 2020; Wang et al., 2021), it may be less influential in our study because of the broader availability of telework nowadays and our focus on within-person effects. On the other hand, the potential self-selection bias of our study participants is concerning. Although convenience sampling is commonly used in time-consuming diary studies (Demerouti & Rispens, 2014), our study may have attracted participants with favorable views on telework, likely introducing a social desirability bias that overstates the positive outcomes of working from home. Future research could target a more diverse sample, including employees from various industries or roles where telework is not as common, to increase generalizability.

Second, our research variables are subject to certain limitations. All measures were based on self-reported data, which increases the risk of common method bias (Podsakoff et al., 2003). While the within-person design of our study helped mitigate this issue, self-reports, particularly of performance, may be prone to specific biases. For example, participants may overestimate their performance due to social desirability or underestimate it due to modesty bias, depending on the context. Although self-reported measures are appropriate for studying individual perceptions, replicating our findings using external evaluations, such as ratings from colleagues or supervisors, would be valuable. That said, assessing individual performance objectively on a daily basis presents significant challenges. Supervisors and colleagues may not have enough insight into employees' daily tasks and outcomes, particularly when employees work from home, making such ratings potentially unreliable or unavailable. Beyond peer or supervisor ratings, future studies could explore other objective performance measures, depending on the nature of the job. Examples include task completion rates, task duration, work quality indicators, customer feedback, or data from digital monitoring tools. In addition, as our research focused on individual performance, it is worthwhile to explore the impact of telework on team performance and other organizational outcomes (de Menezes & Kelliher, 2011; van der Lippe & Lippényi, 2020). Investigating the moderating variables in our study has expanded our understanding of new work contexts. However, variables such as organizational support for telework (Bentley et al., 2016) may also influence telework intensity, normativeness, and voluntariness. Using contextual factors related to hybrid work characteristics (e.g., communication, interruptions, and autonomy) and individual characteristics (e.g., personality traits, motives for telework, and telework skills) can also offer a more detailed understanding of when hybrid work is most effective (Allen et al., 2015; Rudolph et al., 2021; Vanderstukken et al., 2022). Notably, our analysis focused on working from home and in the office, excluding other work locations such as co-working spaces. Moreover, we did not consider schedule flexibility separately, although it is encompassed within workplace flexibility (Allen et al., 2015). Exploring related facets and ways of working (e.g., time flexibility, technology, empowerment, and agile work; Miglioretti et al., 2022; Peters et al., 2014) could enhance our understanding of future work trends.

Third, examining job demands and resources across different work locations as predictor and mediator variables, along with other outcomes, would provide a more comprehensive picture of the effects of hybrid work on well-being.

Fourth, despite of advantages of the diary study design, causal conclusions cannot be drawn. For example, employees may choose to work from home because of emotional exhaustion from the previous day (Shao et al., 2021). Therefore, exploring the reciprocal effects between predictors and outcomes would be valuable for future research. Furthermore, the long-term effects of hybrid work remain unclear. As our study was conducted during the emergence of hybrid-work models, it is uncertain whether our participants had fully adapted to the new work environment. Additionally, the generalizability of our findings is limited, as the context of the study—during the pandemic transition phase—may have influenced employee perceptions and behaviors. While Klonek et al. (2022) demonstrated that the pandemic led to behavioral changes in virtual teams, indicating the start of the post-pandemic transition phase in the summer of 2020, it remains unclear how these findings will apply in more stable, post-pandemic hybrid work settings. As hybrid work continues to evolve, further research, particularly longitudinal studies or (quasi-)experimental designs, is necessary to better understand its implications and enhance the generalizability of our findings.

2.6.3 Practical Implications

To date, organizational practices have primarily focused on the overall perception of telework. However, our study highlights that as hybrid-work models become more prevalent, employees and employers need to consider the intra-individual effects of daily work location on well-being. Given that working from home was associated with less emotional exhaustion and better performance, we recommend implementing hybrid-work models and encouraging employees to use flexible work arrangements. We recommend employees and leaders to reflect on the individual advantages and challenges of working from home or office to further enhance resources and reduce demands.

Furthermore, our study elucidates telework aspects that influence the impact of daily work location on emotional exhaustion and, in turn, on perceived performance. The findings suggest that employees should be provided with the freedom to choose where to work, because being

compelled to work in a specific location, especially on office days, can be detrimental. While ensuring flexibility can be challenging in organizational practice, involving employees in decision-making processes instead of making top-down decisions can enhance empowerment and commitment (Peters et al., 2014). For example, discussing and adjusting rules related to work location and team collaboration could help employees understand the rationale behind such rules, while fostering a sense of participation and job control. In addition, promoting the benefits of office work such as face-to-face interactions (Golden et al., 2008), supports employees' voluntary choice to work there. However, employees should be aware of the benefits of working in the office and consciously use office days to counterbalance any negative effects of working from home. Achieving a balance between flexibility and rules remains a key challenge in hybrid work (Allen et al., 2015; van Steenbergen et al., 2018).

Employers need not worry about performance declines if employees frequently work from home or when many employees in the organization do so, which is often a concern associated with the shift to hybrid-work arrangements. By contrast, telework intensity and normativeness showed a significant interaction with work location in terms of emotional exhaustion, diminishing the positive effects of working from home on emotional exhaustion. However, our findings do not indicate that high telework intensity or normativeness would have negative effects on employees; rather, they seem to only reduce the beneficial effects. Based on the overall positive effects of working from home, and consistent with previous research (Beauregard et al., 2019; Beckel & Fisher, 2022), we recommend a moderate level of telework intensity to strike a balance for well-being. Similarly, a moderate level of telework normativeness is advisable to establish appropriate work routines, skills, and equipment while maintaining the attractiveness of office work. As hybrid work is expected to become more prevalent in the long term, we hope that our study provides practical insights into fostering an organizational culture and work processes that effectively support hybrid work and promote employee health.

3. Study 2

Why and When Does Hybrid Work Affect Daily Well-being? A Moderated Mediation Model of Basic Need Satisfaction and Telework Normativeness

3.1 Abstract

Drawing on self-determination theory, this daily diary study examined the effects of working from home and office on employee well-being through basic need satisfaction. We hypothesized that employees would experience greater autonomy- and competence-needs satisfaction but lower relatedness-need satisfaction when working from home. Additionally, we hypothesized that autonomy- and competence-need satisfaction would mediate the beneficial effects of working from home on work engagement and cognitive stress, whereas relatedness-need satisfaction would mediate its detrimental effects. Considering the emergence of hybrid-work models following the COVID-19 pandemic, we investigated the moderating role of telework normativeness, hypothesizing that the indirect effects of basic need satisfaction would be weaker in high telework-normativeness contexts. We tested our hypotheses using multilevel structural equation models with data collected from 114 employees over two workweeks (744 observations). As hypothesized, work location directly affected basic need satisfaction. The mediation model confirmed the indirect effects of basic need satisfaction on work engagement and cognitive stress. The moderated mediation model indicated that the indirect effects of autonomy- and relatedness-need satisfaction were weaker for employees working in high telework-normativeness settings, whereas competence-need satisfaction was not affected. Our study emphasizes the importance of intra-individual differences in the hybrid-work context and provides insights for optimizing basic need satisfaction and well-being.

3.2 Introduction

The COVID-19 pandemic has accelerated the adoption of telework, leading to hybrid work as a standard practice that combines home and office work (Eurofound, 2022). The percentage of employees in hybrid arrangements increased from 32% in 2019 to 54% in 2024 in the U.S., with

a similar trend observed in Germany, where the percentage of employees working at least partly from home rose from 5.2% to 12.9% (Eurostat, 2024; Gallup, 2024).

Telework offers benefits such as reduced commuting, greater autonomy, and higher job satisfaction (Charalampous et al., 2019; Gajendran & Harrison, 2007; Martin & MacDonnell, 2012), but can also lead to isolation, reduced social support, and work-family conflicts, resulting in mixed outcomes for employees. These varied impacts may arise from differing job characteristics in office and home settings (Beauregard et al., 2019; ter Hoeven & van Zoonen, 2015). For example, working from home may enhance autonomy and job satisfaction, but also heighten isolation (Vega et al., 2015). Understanding these effects is increasingly important with the rise of hybrid work—regularly alternating between home and office—which gained prominence during the pandemic.

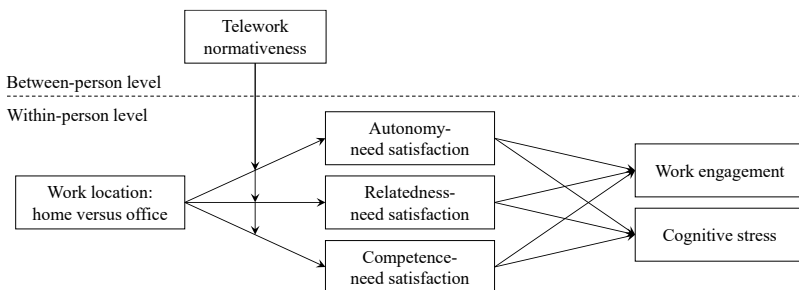
Research on telework has mostly relied on cross-sectional designs. Early diary studies found that employees experience lower stress, higher engagement, and better performance when working from home (Vega et al., 2015). Similarly, Delanoëje & Verbruggen, 2020 showed that on days working at home, employees experienced lower stress, reduced work-to-home conflict, and increased work engagement and job performance. However, on telework days employees also reported greater professional isolation and lower organizational commitment (de Vries et al., 2019). In addition, concentration improves and the need for recovery decreases on days working from home, but high levels of worktime control can exacerbate the negative impact of job demands (Biron & van Veldhoven, 2016). However, these studies do not fully capture potential conflicting effects or the impact of the shift toward hybrid work. By employing self-determination theory (SDT) (Ryan & Deci, 2000), we offer a new theoretical lens, focusing on differential need satisfaction working from home or in the office, and by adding telework normativeness as a boundary condition. Furthermore, as previous studies were conducted before the pandemic, they do not consider the impact of the rapid expansion of hybrid work on the abovementioned effects.

This daily diary study explores how work location affects daily well-being, specifically work engagement and cognitive stress, with basic need satisfaction as a mediator and telework normativeness as a moderator. Figure 6 illustrates the conceptual research model. Based on SDT (Ryan & Deci, 2000), we hypothesized that working from home satisfies autonomy-

and competence needs but may reduce relatedness needs compared to working in the office, affecting work engagement and cognitive stress. SDT emphasizes fulfilling autonomy-, competence-, and relatedness needs, which are essential for well-being and performance. In hybrid work, these needs are affected by the flexibility of home versus office environments. Hybrid arrangements often increase autonomy by allowing choice in location and schedule, which can boost motivation and job satisfaction. Competence perceptions may vary depending on access to resources and feedback in each setting, highlighting areas for optimizing hybrid-work practices. Additionally, while telework may reduce connectedness, in-office work can enhance social bonds, making SDT a valuable framework for testing differential effects.

Furthermore, beneficial consequences of telework that have been reported in literature before the pandemic (e.g., Allen et al., 2015; Beckel & Fisher, 2022; Charalampous et al., 2019) might be at least partly due to the perception scarcity of receiving special treatment by the employer. We suggest that with telework now being more common, its perceived exclusivity has diminished, potentially impacting its effects on need fulfillment (Buunk et al., 2001). Hence, we challenge the ubiquitous assumption of SDT that posits that need fulfillment is equally beneficial under any circumstances by suggesting that evaluations of basic need fulfillment are contingent upon social norms (Buunk et al., 2001; Deci et al., 2017).

Figure 6
Conceptual Research Model



Building on Brunelle and Fortin's (2021) work, who reported higher need satisfaction among teleworkers as compared to office workers in a cross sectional study, and showed that the link between need satisfaction and job satisfaction to be different for teleworkers and office workers, this study additionally incorporated telework normativeness through a within-person design. This approach adds a nuance to SDT's application in hybrid-work settings. Unlike previous diary studies, which highlight both positive and negative impacts of telework (e.g., Biron & van Veldhoven, 2016; de Vries et al., 2019; Delanoëje & Verbruggen, 2020), our study focuses on needs-based mechanisms and boundary conditions to provide a refined understanding of hybrid-work dynamics. By simultaneously examining both the positive and negative outcomes of telework and assessing the fulfillment of basic needs, our study provides a more comprehensive understanding of the complex relationship between work location and employee well-being. These insights extend the existing framework of SDT to an evolving work context, helping to develop targeted organizational strategies for enhancing employee well-being. Furthermore, our research emphasized the importance of accounting for the variability in how employees experience working from home and the office. Practical implications include designing hybrid-work environments that enhance needs satisfaction and address intra-individual differences between home and office work to support employee well-being effectively.

3.3 Theoretical Background

3.3.1 Hybrid Work and Basic Need Satisfaction

Hybrid work allows employees to split their work hours between the traditional office spaces and home work environments (Eurofound, 2022). Unlike telework, the term hybrid work emerged during the COVID-19 pandemic emphasizing regular alternation between locations as an organizational norm. To better understand how work locations impact well-being, Delanoëje and Verbruggen (2020) highlighted the need for within-person analyses, finding that employees experienced lower stress, reduced work-to-home conflict, and higher engagement and performance on days worked from home, but there were no overall differences compared to non-teleworkers. Most within-person studies align with between-person research, reporting benefits such as improved job performance and satisfaction (Müller & Niessen, 2019; Vega et al., 2015), better affective

well-being (Anderson et al., 2015), and less need for recovery and increased concentration (Biron & van Veldhoven, 2016). However, drawbacks like reduced organizational commitment and increased professional isolation also emerge (de Vries et al., 2019). Gajendran et al. (2024) proposed a dual pathway model linking telework to employee outcomes via perceived autonomy and isolation, showing opposing effects through these mediators.

Our study into these psychological mechanisms through the lens of SDT, which posits that people have fundamental psychological needs for autonomy, relatedness, and competence (Deci & Ryan, 2000). In hybrid-work settings, these needs may be differently impacted by home and office environments, with need fulfillment being crucial for motivation, and well-being, as supported by meta-analyses (Ryan et al., 2022) as well as diary studies (Coxen et al., 2021) across social settings and work contexts (Deci et al., 2017; van den Broeck et al., 2016). Given the role of the social environment in supporting these needs (Ryan & Deci, 2000), SDT offers a solid framework to hypothesize about hybrid work's influence on basic need satisfaction.

Autonomy-need satisfaction

The need for autonomy involves a sense of volition and psychological freedom allowing individuals to take responsibility for their actions and align with their values and interests (Deci & Ryan, 2000; Ryan & Deci, 2000). Compared with office work, home-based work often provides a more autonomy-supportive environment, offering employees greater flexibility and control over task structure and performance. Additionally, reduced commuting and an improved work-life balance enhance their sense of choice and self-endorsement (Gagné et al., 2022). The association of telework with job control and autonomy is well-documented (Gajendran & Harrison, 2007) and confirmed at the within-person level (Müller & Niessen, 2019). Thus, we propose that working at home promotes autonomy-need satisfaction (Brunelle & Fortin, 2021; Perry et al., 2018).

Hypothesis 1a: Employees perceive greater autonomy-need satisfaction on days working from home than working in the office.

Relatedness-need satisfaction

The need for relatedness involves seeking meaningful connections to feel accepted by others (Deci & Ryan, 2000). This need is harder to fulfill

when working from home due to reduced face-to-face and informal interactions (Golden et al., 2008). Physical distance limits communication and identification with organizations and colleagues (Thatcher & Zhu, 2006). Moreover, social support, closely linked to relatedness (van den Broeck et al., 2016), is often limited in telework (Sardeshmukh et al., 2012; Vander Elst et al., 2017). These factors contribute to professional isolation, a key challenge of telework (Cooper & Kurland, 2002; de Vries et al., 2019; Golden et al., 2008). Gajendran et al. (2024) found that perceived isolation mediates telework's negative effects, and extensive telework can reduce the quality of relationships among colleagues (Wöhrmann & Ebner, 2021). Although Brunelle and Fortin (2021) found higher relatedness-need satisfaction in teleworkers, possibly due to organizational practices to mitigate isolation, overall, relatedness-need satisfaction tends to be lower at home due to fewer opportunities for social support and connection. Therefore, the following hypothesis is proposed:

Hypothesis 1b: Employees perceive less relatedness-need satisfaction on days working from home than working in the office.

Competence-need satisfaction

The need for competence involves feeling skilled, mastering challenges, and interacting effectively with the environment (Deci & Ryan, 2000). Teleworking offers greater job control and flexibility (Allen et al., 2015), which supports this need (Fernet et al., 2013). Reduced disruptions, lower time pressure, and better concentration at home (Biron & van Veldhoven, 2016; Darouei & Pluut, 2021; Wöhrmann & Ebner, 2021) enhance task completion and mastery. Despite fewer competence-supporting resources like feedback and social support (van den Broeck et al., 2016), telework has been linked to higher productivity and performance (Delanoëije & Verbruggen, 2020; Gajendran & Harrison, 2007), suggesting improved skill use and development. Thus, consistent with between-person findings (Brunelle & Fortin, 2021), we propose that working from home better fulfills competence needs than office work.

Hypothesis 1c: Employees perceive greater competence-need satisfaction on days working from home than working in the office.

3.3.2 Work Engagement and Cognitive Stress as Outcomes

SDT posits that supporting autonomy (freedom to make decisions), competence (skills and efficacy), and relatedness (connections with others) in work environments fosters well-being and more internalized motivation (Ryan & Deci, 2000). Work engagement, defined as a “positive, fulfilling, work-related state of mind characterized by vigour, dedication, and absorption” (Schaufeli & Bakker, 2004, p. 295), is expected to be higher when these basic needs are met. Telework studies, however, show mixed results on work engagement—some report positive effects (Delanoëije & Verbruggen, 2020), while others find negative (Sardeshmukh et al., 2012) or no effects (de Vries et al., 2019; Vander Elst et al., 2017). Although telework can enhance autonomy, reduce time pressure, and minimize interruptions, it may also weaken employees' sense of connection to the workplace, which could reduce relatedness and thus their emotional attachment to the job. This balance between the benefits of autonomy and potential drawbacks in relatedness may explain the varying results in telework research (Gajendran et al., 2024). Focusing on work engagement highlights how effectively employees immerse in work from home, where direct supervision is limited, with the flexibility of telework often boosting vigour and concentration (Kelliher & Anderson, 2010); nevertheless, the lack of social support and feedback can dampen their engagement (Bakker et al., 2023; Beauregard et al., 2019).

Cognitive stress is the mental strain experienced when job demands exceed an employee's perceived ability to cope. According to SDT, unmet basic needs increase the likelihood of stress, burnout, and negative outcomes (van den Broeck et al., 2008). Limited autonomy, perceived incompetence, and a lack of social connection can all elevate cognitive stress. This focus on cognitive stress is particularly relevant for understanding the mental demands of technology use in hybrid-work environments, as it affects concentration and decision-making (Athanasiadou & Theriou, 2021; Suh & Lee, 2017). While telework's impact on cognitive well-being is increasingly important, it remains under-researched (Charalampous et al., 2019), with few studies directly investigating cognitive stress in this context (Vander Elst et al., 2017). Exploring cognitive stress across home and office environments is essential, as these settings differ in terms of flexibility, potential interruptions, and reliance on digital communication. Home environments may support cognitive function through quieter, more controlled settings, whereas office

environments, with frequent interruptions and higher collaborative demands, may increase cognitive load (Bailey & Kurland, 2002; Sardeshmukh et al., 2012; van Steenbergen et al., 2018). Further exploration can clarify whether the benefits of telework, such as enhanced concentration and reduced recovery needs, truly ease cognitive stress compared to office-based work.

Mediating Role of Basic Need Satisfaction

SDT posits that needs satisfaction—covering autonomy, competence, and relatedness—is essential for intrinsic motivation and well-being (Deci & Ryan, 1985). When employees' basic psychological needs are met, they tend to experience greater work engagement, finding their tasks meaningful and fulfilling. Conversely, unmet needs can decrease engagement due to feelings of inadequacy, lack of control, or isolation, which can impair motivation and commitment (Coxen et al., 2021; Wang et al., 2020).

Cognitive stress occurs when job challenges exceed employees' cognitive resources (Suh & Lee, 2017), and unmet needs can intensify this stress, increasing strain and reducing self-efficacy. For instance, the lack of autonomy can lead to frustration and mental exhaustion, while insufficient competence support may increase cognitive load and decision-making difficulties (Coxen et al., 2021; de Gieter et al., 2018).

Cross-sectional studies show that basic need satisfaction is linked to work engagement and strain (Albrecht, 2015; Trépanier et al., 2015; van den Broeck et al., 2008), while diary studies reveal similar positive daily effects (Coxen et al., 2021). Regarding strain, de Gieter et al. (2018) found that autonomy-need satisfaction, but not competence-need satisfaction, mediated the relationship between job demands, resources, and strain, whereas relatedness-need satisfaction was not examined. Building on evidence and Hypotheses 1a-b, suggesting increased autonomy and competence but decreased relatedness at home, we propose that basic need satisfaction mediates the effects of home versus office work on engagement and cognitive stress.

Hypothesis 2: Employees perceive a) more work engagement and b) less cognitive stress on days working from home than working in the office due to increased autonomy-need satisfaction.

Hypothesis 3: Employees perceive a) less work engagement and b) more cognitive stress on days working from home than working in the office due to decreased relatedness-need satisfaction.

Hypothesis 4: Employees perceive a) more work engagement and b) less cognitive stress on days working from home than working in the office due to increased competence-need satisfaction.

3.3.3 Moderating Role of Telework Normativeness

Telework normativeness refers to how widely telework is accepted and practiced within an organization (Gajendran et al., 2015; Golden & Eddleston, 2020). Prior to COVID-19, telework was uncommon and often limited to specific roles (Bailey & Kurland, 2002). However, the pandemic increased its prevalence and acceptance, establishing hybrid work as a standard option for many roles. This shift likely influences how work location affects basic need satisfaction, work engagement, and cognitive stress.

As telework becomes common, its perceived benefits may decrease, losing the novelty and exclusivity it once had (Gajendran et al., 2015). Previously, telework was a privilege for a few employees, who felt trusted by their employers; now, with broader access, this sense of exclusivity is diminished. In high-normativeness environments, organizational support for telework grows through workflows, virtual tools, and structured communication channels, which may enhance relatedness and competence by improving connectivity, skill development, and informal social interactions (Biron et al., 2022; van Zoonen & Sivunen, 2021). Features like branded backgrounds in virtual meetings may also strengthen organizational identification (Thatcher & Zhu, 2006).

In sum, higher telework normativeness lessens the distinct benefits and drawbacks of telework and adjusts the work design, likely reducing autonomy- and competence-related gains while minimizing relatedness losses. We hypothesize that as telework normativeness increases, the differences between home- and office-based work will diminish.

Hypothesis 5: Telework normativeness moderates the indirect effects of working from home, compared to working in the office, on a) work engagement and b) cognitive stress via autonomy-need satisfaction. Specifically, the indirect positive effects on work engagement and the

indirect negative effects on cognitive stress will be stronger when telework normativeness is low and weaker when it is high.

Hypothesis 6: Telework normativeness moderates the indirect effects of working from home, compared to working in the office, on a) work engagement and b) cognitive stress via relatedness-need satisfaction. Specifically, the indirect positive effects on work engagement and the indirect negative effects on cognitive stress will be stronger when telework normativeness is low and weaker when it is high.

Hypothesis 7: Telework normativeness moderates the indirect effects of working from home, compared to working in the office, on a) work engagement and b) cognitive stress via competence-need satisfaction. Specifically, the indirect positive effects on work engagement and the indirect negative effects on cognitive stress will be stronger when telework normativeness is low and weaker when it is high.

3.4 Methods

3.4.1 Procedure and Participants

Participants were recruited through social media, personal connections, and professional networks, targeting hybrid-work employees. Additionally, we contacted organizations in Germany. One financial organization agreed to participate in the study and distributed the registration link to their employees. This sampling approach yields a diverse sample ideal for diary studies (Demerouti & Rispens, 2014). Incentives included raffling €25 vouchers and donating €1 per completed survey to a German charity. Participants also received detailed study reports. Ethical approval was obtained from the local ethics committee (2022-JGU-psychEK-S020). Data were collected via web-based questionnaires in May, June, and September 2022, avoiding the German holiday season. Although the COVID-19 pandemic was still ongoing at that time, restrictions mandating employees to work from home had already been lifted, allowing for the transition to hybrid-work arrangements (Klonek et al., 2022). After consenting, participants completed a general questionnaire and selected a two-week diary period. Subsequently, they received emails from Monday to Friday to complete a short questionnaire at the end of each workday.

From the 182 enrolled participants, we excluded 20 who did not work at least 19 hours per week or complete the general questionnaire and 48 who did not complete even one valid daily questionnaire for each work location. A daily questionnaire was considered valid if participants reported spending at least 75% of their work hours at home or in the office. The cut-off value ensured a robust comparison between days worked from home and days worked in the office while minimizing confounding effects and data loss. To avoid recall bias, questionnaires were only valid if completed before midnight. After applying these inclusion criteria to the participants and questionnaires, the final data set consisted of 114 participants who provided 744 daily diaries ($M = 6.53$; $SD = 2.13$).

The final sample mainly comprised females (69.3%) with a mean age of 40.4 years ($SD = 10.32$) and mean job tenure of 17.43 years ($SD = 11.87$). Of the 114 participants, 80 came from the convenience sample and 34 from the financial organization. This resulted in a higher proportion of participants working in the financial and insurance industries (57%), with the remainder representing various business sectors. The sample was highly educated, with 59.6% holding an academic degree and 8.8% having a doctoral degree. On average, participants worked 39.23 hours per week ($SD = 7.75$), with 54.42% of their work hours spent at home ($SD = 17.58\%$). Around 20% of participants reported living alone and 17.5% of households included children under the age of 12 years. Of the 114 participants, 66 were satisfied with their current work arrangements, 46 preferred to work from home more often, and two preferred to work from home less often.

Given the significant representation of participants from the financial sector ($N = 65$), we compared key characteristics between the financial and non-financial sector samples. The proportion of women was substantially higher in the financial sector (80%) than in the non-financial sector (55.1%). Participants in the financial sector were older, with a mean age of 43.61 years ($SD = 10.81$), and had a longer job tenure, averaging 21.48 years ($SD = 12.33$), compared to the non-financial sector, where the mean age was 36.73 years ($SD = 8.45$), and the average job tenure was 12.14 years ($SD = 8.86$). The extent of telework was also slightly higher in the financial sector, with participants spending 57.37% of their work hours ($SD = 10.09\%$) at home, compared to 50.51% ($SD = 23.76\%$) in the non-financial sector.

3.4.2 Measures

Socio-demographic and telework variables at the between-person level were assessed using a general questionnaire. All other variables were measured using a daily questionnaire, with the timeframe of instructions and items adjusted to refer to daily measurements. Following diary studies' recommendations (Ohly et al., 2010), we used shortened scales. All items were originally developed in German. For work engagement and cognitive stress, where the original scale was in English, the German versions, as provided by the developers, were used.

Work Location

Participants indicated their daily work location by recording the number of work hours for each of the following work locations: a) office (traditional company-based workplace); b) home; and c) other (business trips or irregular remote-work locations). Using this data, we calculated each work location's percentage of work hours. We dummy-coded the variable with 0 = working in the office and 1 = working from home, using a cut-off of 75% of the total work hours for that day.

Basic Need Satisfaction

Daily satisfaction of the needs for autonomy, relatedness, and competence was measured with three items each, using the subscales developed by Albrecht (2015). Participants reported the extent to which their needs were satisfied on the day, for example, "Your need for a sense of control over how you do your job" (autonomy-need satisfaction), "Your need for a sense of connection with the people you work with" (relatedness-need satisfaction), or "Your need for feeling confident about how you execute your work" (competence-need satisfaction). Responses were provided on a five-point scale (1 = *not at all satisfied*, 5 = *very satisfied*). To determine the distinctiveness of the three basic needs, we performed multilevel confirmatory factor analyses. The three-factor model showed a good model fit ($\chi^2 = 65.78$, $df = 24$, $p < .001$; CFI = 0.99, TLI = 0.96, RMSEA = 0.05) and fitted the data better than the one-factor model ($\Delta\chi^2(3) = 968.53$, $p < .001$). Cronbach's alphas at the within-person level were .86 for autonomy-, .84 for relatedness-, and .81 for competence-need satisfaction.

Telework Normativeness

Building on Golden and Eddleston (2020), we asked participants using the general questionnaire to estimate the percentage of their direct colleagues who regularly worked from home. To increase the accuracy of telework normativeness, participants estimated the percentage of work hours spent at home by these colleagues. We then multiplied the percentage of teleworking colleagues by their average telework extent, indicating telework normativeness on a scale ranging from 0 to 1.

Work Engagement

We assessed daily work engagement using the German version of the three-item Utrecht Work Engagement Scale (UWES-3; Schaufeli et al., 2019), comprising one item for each dimension (vigour, dedication, absorption), for example, “I am enthusiastic about my job.” Items were rated on a seven-point scale (1 = strongly disagree, 7 = strongly agree). Cronbach’s alpha at the within-person level was .88.

Cognitive Stress

We measured daily cognitive stress using the German version of the Copenhagen Psychosocial Questionnaire’s four-item subscale (COPSOQ; Nübling et al., 2005). A sample item is “How often have you found it difficult to think clearly?” Participants answered questions on a five-point scale (1 = (almost) never, 5 = (almost) always). Cronbach’s alpha at the within-person level was .80.

Confirmatory Factor Analyses

To prove that our study measures can be empirically discriminated, and as we were primarily interested in within-person relationships, we ran a set of partially saturated multilevel confirmatory factor analyses. The results showed that a five-factor model, distinguishing between the three basic needs, work engagement and cognitive stress ($\chi^2 = 430.17, p < .001$, CFI = .940, TLI = .844, SRMR = .034) outperformed alternative models, like a three-factor model combining all needs to one latent factor ($\chi^2 = 1885.61, p < .001$, CFI = .694, TLI = .262, SRMR = .107), and a one-factor model ($\chi^2 = 2702.58, p < .001$, CFI = .556, TLI = -.037, SRMR = .123).

3.4.3 Analysis Strategy

Given our diary data's multilevel structure, with 744 days (level 1) nested within 114 individuals (level 2), we applied multilevel structural equation modeling (MSEM) using Mplus version 7.3 (Muthén & Muthén, 1998-2014). This approach decomposes the variance of within-person (level-1) variables into latent within-person and between-person components (Preacher et al., 2010). Since telework normativeness, as a level-2 variable, contains only between-person variance, we centred this variable at the grand mean to facilitate interpreting the results (Enders & Tofighi, 2007).

To examine the direct effects of work location on autonomy-, relatedness-, and competence-needs satisfaction (Hypotheses 1a-c) and the indirect effects of basic need satisfaction (Hypotheses 2a-b, 3a-b, 4a-b), we followed the 1-1-1 MSEM syntax outlined by Preacher et al. (2010). Telework normativeness was then introduced as a level-2 moderator in the model to test the conditional indirect effects of telework normativeness (Hypotheses 2a-b, 3a-b, 4a-b), employing a first-stage moderated mediation model. We assessed the moderated mediation effects (Hypotheses 5a-b, 6a-b, 7a-b) using Hayes' (2015) index of moderated mediation (IMM) and plotted significant interactions, analyzing conditional indirect effects for mediated moderation (Preacher et al., 2006).

3.5 Results

3.5.1 Descriptive Statistics

Table 6 presents all variables' descriptive statistics and correlations. Before testing the hypotheses, we assessed within-person (level-1) and between-person (level-2) variances using the intraclass correlation coefficient. Within-person variations accounted for 48% to 61% of the variance in the mediator and outcome variables (Table 6), supporting our within-person analysis approach.

Table 6
Means, Standard Deviations, Within-Level Variances, and Correlations

	<i>M</i>	<i>SD</i>	1-ICC ^a	1	2	3	4	5	6	7
1. Work location ^b	0.56	0.50	—	—	.28***	-.33***	.11**	—	.05	-.29***
2. Autonomy-need satisfaction	4.04	0.87	0.61	.27	—	.18*	.52***	—	.44***	-.46***
3. Relatedness-need satisfaction	3.61	0.98	0.57	.30	.67***	—	.34***	—	.30***	-.45***
4. Competence-need satisfaction	3.94	0.80	0.48	.33	.61***	.48***	—	—	.51***	-.48***
5. Telework normativeness ^c	0.51	0.21	—	.78*	.03	.08	-.11	—	—	—
6. Work engagement	4.37	1.33	0.54	.19	.40***	.43***	.66***	-.13	—	-.54***
7. Cognitive stress	1.89	0.77	0.52	-.20	-.46***	-.34**	-.75***	.19	-.54***	—

Note: Correlations above the diagonal are within-person (level-1) correlations ($N = 744$).

Correlations below the diagonal are between-person (level-2) correlations ($N = 114$).

^aICC = intraclass correlation coefficient (= variance at between level / (variance at within level + variance at between level)). 1-ICC refers to the percentage of the within-person variance.

^bWork location: 0 = working in the office, 1 = working from home.

^cTelework normativeness was assessed only at the between-person level (level 2).

* $p < .05$; ** $p < .01$; *** $p < .001$.

3.5.2 Hypotheses Testing

Table 7 presents the MSEM results, focusing on within-person effects. Hypotheses 1-4 were tested in the 1-1-1 mediation model. The model confirmed the hypothesized direct effects of work location on basic need satisfaction. Specifically, working from home predicted higher autonomy-need satisfaction ($b_{autonomy} = .39, p < .001$; supporting Hypothesis 1a), lower relatedness-need satisfaction ($b_{relatedness} = -.50, p < .001$; supporting Hypothesis 1b), and higher competence-need satisfaction ($b_{competence} = .12, p = .01$; supporting Hypothesis 1c) than working in the office. The model also confirmed the hypothesized indirect effects of work location on work engagement and cognitive stress through basic need satisfaction. Autonomy-, relatedness- and competence-need satisfaction mediated the effect of work location on work engagement ($b_{autonomy} = .13, p < .001$; $b_{relatedness} = -.09, p = .001$; $b_{competence} = .07, p = .01$) and cognitive stress ($b_{autonomy} = -.07, p < .001$; $b_{relatedness} = .06, p = .001$; $b_{competence} = -.04, p = .01$), supporting Hypotheses 2a and 2b, 3a and 3b, and 4a and 4b, respectively.

Hypotheses 5 and 6 were examined using a moderated mediation model; findings are detailed in Table 8. As hypothesized, telework normativeness moderated the indirect effects of work location on work engagement and cognitive stress through autonomy-need satisfaction. The moderated mediation indices were significant for both work engagement ($IMM_{autonomy} = -.21, p = .03$) and cognitive stress ($IMM_{autonomy} = .11, p = .04$). Simple slope analyses indicated that the indirect effect of work location on work engagement via autonomy-need satisfaction was less positive in high telework-normativeness settings (+1 *SD*: $b_{autonomy} = .09, p = .003$) compared to low telework-normativeness settings (-1 *SD*: $b_{autonomy} = .18, p < .001$). Similarly, the indirect effect on cognitive stress was less negative in high-normativeness settings (+1 *SD*: $b_{autonomy} = -.05, p = .004$) compared to low-normativeness settings (-1 *SD*: $b_{autonomy} = -.09, p < .001$). These findings, illustrated in Figure 7, confirm Hypotheses 5a and 5b.

The moderated mediation effects involving relatedness-need satisfaction were significant for work engagement ($IMM_{relatedness} = .13$, $p = .04$) and cognitive stress ($IMM_{relatedness} = -.08$, $p = .04$). Conditional indirect effects revealed that the negative impact of working from home on work engagement via relatedness-need satisfaction was lower in high-normativeness organizations (+1 *SD*: $b_{relatedness} = -.07$, $p = .006$) than in low-normativeness ones (-1 *SD*: $b_{relatedness} = -.12$, $p = .001$). Similarly, the positive effect on cognitive stress was reduced in high-normativeness settings (+1 *SD*: $b_{relatedness} = .04$, $p = .003$) compared to low-normativeness settings (-1 *SD*: $b_{relatedness} = .08$, $p = .001$). These findings, as depicted in Figure 8, support Hypotheses 6a and 6b.

Contrary to our hypothesis, telework normativeness did not moderate the indirect effect of work location on work engagement or cognitive stress through competence-need satisfaction. As we found no significant moderated mediation indices for work engagement: ($IMM_{competence} = -.17$, $p = .22$) and cognitive stress ($IMM_{competence} = .08$, $p = .22$), Hypotheses 7a and 7b were rejected.

Table 8*Results of the Moderated Mediation Model*

		Outcome variables					
		Work engagement			Cognitive stress		
Moderated mediation effects		<i>B</i>	<i>SE</i>	<i>95% CI</i>	<i>B</i>	<i>SE</i>	<i>95% CI</i>
Index:	Autonomy-need satisfaction	-.21*	.10	<i>[-.40, -.02]</i>	.11*	.05	<i>[.01, .20]</i>
Index:	Relatedness-need satisfaction	.13*	.07	<i>[.004, .26]</i>	-.08*	.04	<i>[-.16, -.004]</i>
Index:	Competence-need satisfaction	-.17	.14	<i>[-.44, .10]</i>	.08	.07	<i>[-.05, .22]</i>
Conditional indirect effects		<i>B</i>	<i>SE</i>	<i>95% CI</i>	<i>B</i>	<i>SE</i>	<i>95% CI</i>
Via autonomy-need satisfaction							
	-1 <i>SD</i>	.18***	.04	<i>[.10, .26]</i>	-.09***	.02	<i>[-.13, -.05]</i>
	<i>M</i>	.14***	.03	<i>[.08, .19]</i>	-.07***	.02	<i>[-.10, -.04]</i>
	+1 <i>SD</i>	.09**	.03	<i>[.03, .15]</i>	-.05**	.02	<i>[-.08, -.01]</i>
Via relatedness-need satisfaction							
	-1 <i>SD</i>	-.12**	.04	<i>[-.20, -.05]</i>	.08**	.02	<i>[.03, .12]</i>
	<i>M</i>	-.09**	.03	<i>[-.15, -.04]</i>	.06***	.02	<i>[.03, .09]</i>
	+1 <i>SD</i>	-.07**	.02	<i>[-.11, -.02]</i>	.04**	.01	<i>[.01, .07]</i>
Via competence-need satisfaction							
	-1 <i>SD</i>	.11*	.04	<i>[.03, .12]</i>	-.05*	.02	<i>[-.09, -.01]</i>
	<i>M</i>	.07*	.03	<i>[.02, .13]</i>	-.04*	.01	<i>[-.06, -.01]</i>
	+1 <i>SD</i>	.04	.04	<i>[-.04, .11]</i>	-.02	.02	<i>[-.06, .02]</i>

Note: $N = 744$ days (114 employees).

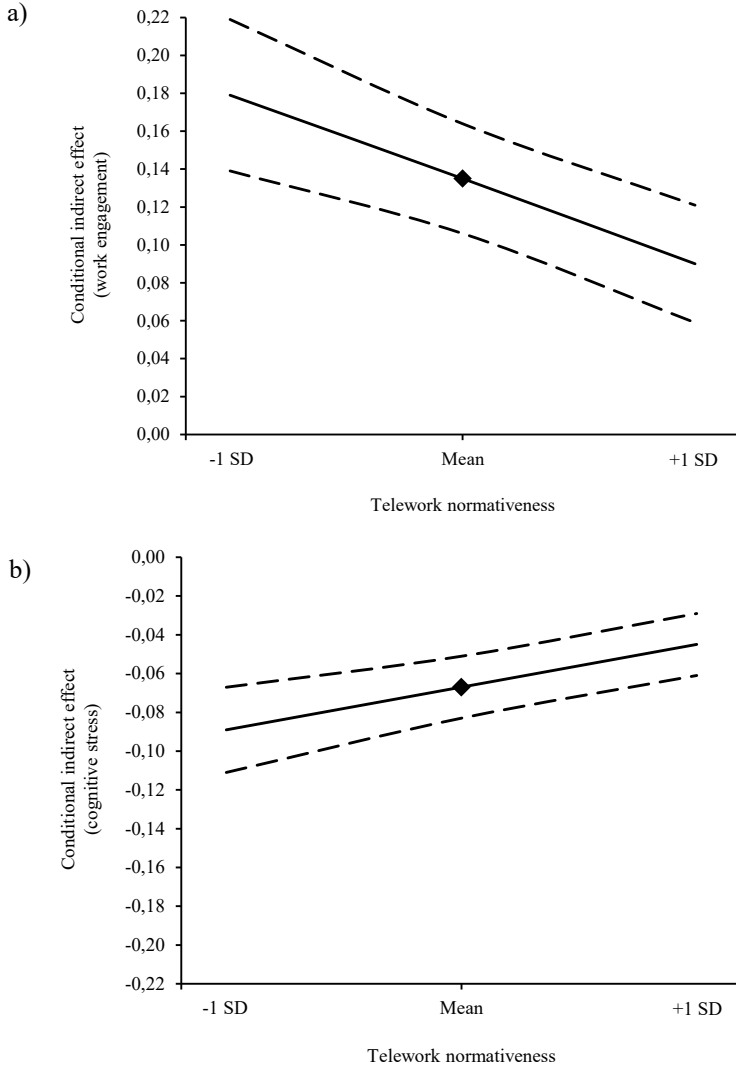
Index = moderated mediation effect with work location as a predictor (level 1), basic need satisfaction of autonomy, relatedness, and competence as mediators (level 1), and telework normativeness as a moderator (level 2); conditional indirect effects at high (+1 *SD* = standard deviation), average (*M* = mean) and low (-1 *SD*) values of the moderator;

B = unstandardized estimate; *SE* = standard error; *CI* = confidence interval, values presented in italics indicate that the CI excludes zero.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Figure 7

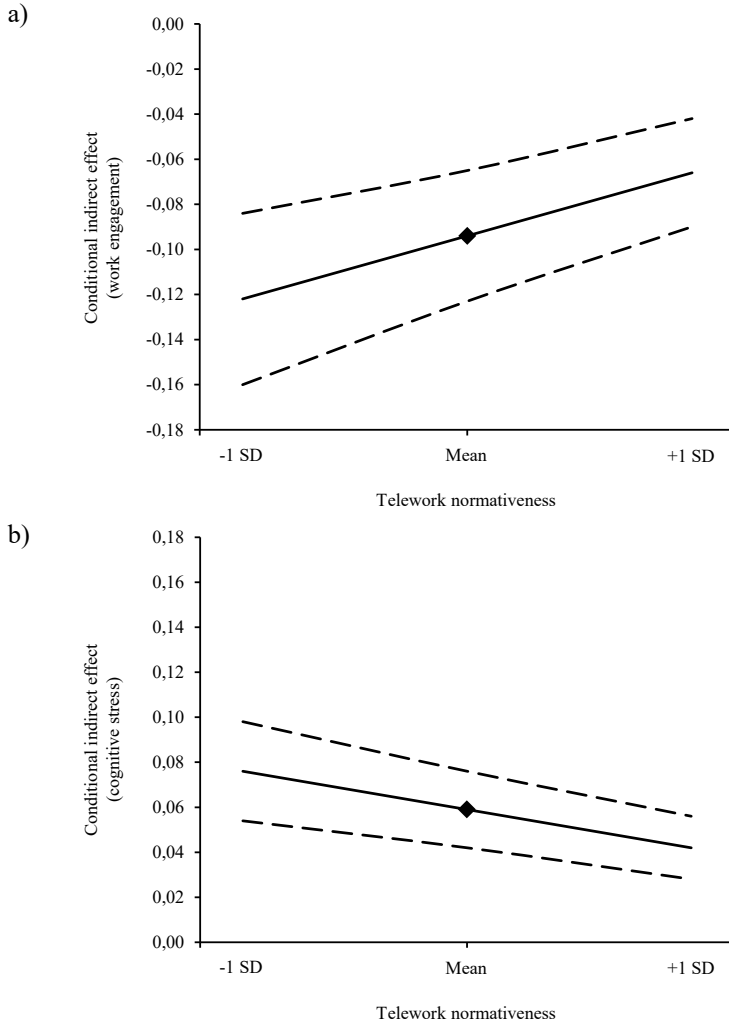
Conditional Indirect Effects for Significant Moderated Mediations of Work Location on a) Work Engagement and b) Cognitive Stress via Autonomy-Need Satisfaction



Note: Dashed lines represent the upper and lower bounds of the 95% confidence interval.

Figure 8

Conditional Indirect Effects for Significant Moderated Mediations of Work Location on a) Work Engagement and b) Cognitive Stress via Relatedness-Need Satisfaction



Note: Dashed lines represent the upper and lower bounds of the 95% confidence interval.

3.6 Discussion

This daily diary study aimed to uncover the within-person effects of hybrid work on employee well-being. Based on the SDT (Ryan & Deci, 2000), we examined indirect effects of work location through basic need satisfaction for autonomy, relatedness, and competence on work engagement and cognitive stress and added telework normativeness as a boundary condition. Our analysis confirmed these mediation paths. Working from home increased autonomy- and competence-needs satisfaction, which were positively associated with work engagement and negatively associated with cognitive stress. However, on days working at home participants reported less relatedness-need satisfaction, which, in turn, was negatively related to work engagement and positively to cognitive stress. Further, we investigated the moderating role of telework normativeness, which reflected the acceptance and prevalence of hybrid work. The moderated mediation model supported our hypotheses that the indirect effects through autonomy- and relatedness-needs satisfaction are weaker as telework normativeness increases. However, telework normativeness did not moderate the mediating effect of competence-need satisfaction.

3.6.1 Theoretical Implications

Our study contributes to the telework and SDT literature by offering a nuanced understanding of how specific aspects of basic need satisfaction—autonomy, relatedness, and competence—mediate the daily effects of work location on work engagement and cognitive stress. By demonstrating the mediating role of basic need satisfaction in the relationship between work location and both work engagement and cognitive stress, we empirically tested the conflicting positive and negative outcomes of teleworking. Autonomy and isolation have been identified as crucial job characteristics in the hybrid-work context and are supposed to have opposing mediating effects (Allen et al., 2015; ter Hoeven & van Zoonen, 2015). Our study clarified how each basic need contributes uniquely to these dynamics. Corresponding to the less conclusive evidence that either work location fulfils the need for competence more effectively, the weaker link we observed between work location and competence-need satisfaction suggests that, in hybrid contexts, competence may be less contingent on physical location than on other factors, such as job role or support. This implies that

not all basic needs are equally impacted by the work environment, a finding that highlights the need for tailored interventions that consider the distinct role of each need.

Additionally, by integrating the concept of telework normativeness as a moderator, we advance SDT by challenging its assumption of universal perceptions of need satisfaction. Our study leveraged SDT's focus on the importance of social context in satisfying basic needs. Specifically, we demonstrated that high telework normativeness—where telework is broadly accepted and common within an organization—diminishes the distinct impacts of work location on need satisfaction. As telework becomes more normalized, its psychological benefits and drawbacks may converge, potentially reducing the distinctive effects of working from home versus the office. This insight contributes to SDT by underscoring that the social context, especially shared norms around telework, plays a pivotal role in shaping the impact of need satisfaction on work outcomes. Moreover, this finding has practical implications for organizations, suggesting that as telework becomes more routine, employers might focus less on location-specific strategies and more on fostering a flexible culture that meets employees' evolving needs.

Our study also highlighted the unique context of post-pandemic hybrid work, noting that previous findings may not directly apply to the current work environment. Introducing telework normativeness allows us to account for this shift, making our research particularly relevant as organizations continue to adjust their telework policies. Our findings underscore the importance of understanding telework's evolving role and call for further investigation into how the prevalence and acceptance of hybrid work might influence various work outcomes.

Finally, by employing a diary design, our study captured within-person variations in work location, offering insights into the day-to-day impacts of hybrid work. This design allowed us to examine the dynamic nature of hybrid-work environments, contributing to a more granular understanding of how daily fluctuations in work location influence immediate outcomes in engagement and stress. This approach underscores the value of studying within-person effects in hybrid work research, where traditional cross-sectional methods may fail to capture the nuanced, shifting experiences of employees moving between home and office work. Future research could build on this by examining longer-term trends and exploring

other individual and contextual moderators that may influence how employees respond to different work environments.

3.6.2 Limitations and Directions for Future Research

As with every study, our study has some limitations. First, although we used self-reported measures to effectively capture subjective perceptions (particularly crucial in home settings), common method bias can be a concern (Podsakoff et al., 2003). However, daily measures and variance decomposition through MSEM (Preacher et al., 2010) help mitigate this bias.

Second, one of the key limitations of our study is the concurrent assessment of all variables at the same point in time within a day. This design choice, while providing rich daily-level data, restricts our ability to establish causality, particularly for the mediating effects of need satisfaction. Consequently, our findings should be interpreted as indicative of associations rather than definitive causal pathways. Future research should employ longitudinal and time-lagged designs to better capture the temporal dynamics and causal relationships between telework, need satisfaction, and well-being outcomes. Additionally, experimental and quasi-experimental approaches could provide more robust evidence of causality.

Third, the generalizability of our study results is limited. Although the transition to hybrid-work models was largely completed during our study period (Klonek et al., 2022), we cannot rule out that pandemic-related influences affected our findings. Additionally, our sample consisted predominantly of participants from the financial sector, with a higher proportion of female and older participants, which may further limit generalizability. While our focus on within-person effects reduces between-level variability concerns, replication in more diverse, post-pandemic samples would strengthen confidence in the findings.

Fourth, our study has further limitations related to variable choices. Work location as a predictor variable only covers location flexibility; however, time flexibility is another essential aspect of hybrid work that can be assessed in future studies (Allen et al., 2015). Furthermore, we only analyzed two work locations (home and office), neglecting the potential significance of other work locations. Future research should examine other location-related aspects of teleworking, such as scheduling flexibility and

technology use, to gain a more nuanced understanding of how these factors affect basic needs in different work contexts.

Our study focused on the mediating role of basic need satisfaction for each need separately, exclusively exploring needs satisfaction without considering needs frustration (Coxen et al., 2021; van den Broeck et al., 2016). For example, isolation at home may represent not only the absence of relatedness-need satisfaction but also its frustration. Future research should examine basic need satisfaction and frustration to fully understand these dual pathways. Furthermore, we could not clarify which job characteristics specifically satisfied the basic needs. For example, the need for competence may be satisfied through more feedback at the office but also through increased mastery and effectiveness at home. Consequently, further research is required to determine location-specific predictors of basic need satisfaction.

The use of telework normativeness as a moderator in our study, while insightful, does not pinpoint the moderating effects of specific work environment characteristics. However, it serves as a foundation for future research to explore more specific moderators in the hybrid-work context, such as meeting culture, organizational support, and technology use (Beckel & Fisher, 2022). Additionally, investigating leader- and employee-specific traits, attitudes, and behaviours, such as leadership styles or job-crafting behaviours (Beauregard et al., 2019; Biron et al., 2022; Coxen et al., 2023), could reveal influencing factors on the relationship between work location and well-being. Moreover, a potential limitation of our study is that employees' estimates of their coworker's telework intensity may lack accuracy. Although an employee's subjective perception of telework normativeness might have a greater influence on their well-being more than objective measures, future studies could strengthen the measure of telework normativeness by including assessments from supervisors or coworkers regarding their actual telework frequency.

Work engagement and cognitive stress were useful outcome variables in our study. To better understand the effects on these outcomes, future studies could examine these constructs more closely by assessing work engagement subscales and exploring other cognitive stress dimensions, such as rumination, cognitive irritation, or psychological detachment.

3.6.3 Practical Implications

Our study offers practical insights for organizations. First, it suggests that hybrid-work arrangements benefit both employees and employers, primarily because of increased autonomy- and competence-need satisfaction at home. However, focusing on potential negative effects of lower relatedness-need satisfaction when working at home is crucial. Echoing past research that reported curvilinear relationships between the extent of teleworking and well-being outcomes (Golden & Veiga, 2005; Virick et al., 2010), a balanced approach to hybrid work is recommended. Optimizing the mix of home- and office-based work can enhance autonomy and competence benefits while mitigating issues related to lower relatedness.

Second, by focusing on within-person differences, our study highlights the importance of basic need satisfaction at different work locations. We suggest offering location-specific resources to maximize autonomy- and competence-need satisfaction. While complete flexibility may be impractical, involving employees in decision-making and providing clarity and self-efficacy can enhance need satisfaction (van den Broeck et al., 2008). Additionally, supervisors should proactively provide instant feedback and guidance to foster competence-need satisfaction. By contrast, the need for relatedness was less satisfied when working from home. To satisfy this need, focusing on social support is most effective given its role as the strongest predictor of relatedness-need satisfaction (van den Broeck et al., 2016). Encouraging social interaction and virtual collaboration through technical tools and platforms enhances team spirit and connectedness, thus preventing feelings of isolation. Furthermore, maintaining organizational commitment and identification at home is essential (Thatcher & Zhu, 2006) and can be achieved through work routines (e.g., virtual meetings) and organizational cues (e.g., branded office supplies and corporate design elements).

Finally, it is crucial to consider the moderating role of telework normativeness in organizations, particularly because of the concerns of potential disadvantages of a high prevalence of telework. Our findings suggest that high telework normativeness simultaneously attenuates both positive (via autonomy-need satisfaction) and negative (via relatedness-need satisfaction) indirect effects or either has no indirect effect at all (via competence-need satisfaction). These findings underscore that the impact of telework is not universal but can vary depending on the organizational culture and its acceptance of hybrid work. Organizations should address

these moderating factors to optimize basic need satisfaction and well-being in both home and office environments and help employees cope with each work location's demands (Deci et al., 2017). Given that hybrid work will continue to increase, we recommend focusing on intra-individual differences between home- and office-based work, both in theory and practice.

4. Study 3

Within-person Dynamics of Stressors and Well-being in Hybrid-work Arrangements: Examining the Moderating Effects of Work Location and Telework Normativeness

4.1 Abstract

Purpose. Despite the rapid adoption of hybrid-work models, the role of work location for the relationship between job stressors and well-being remains underexplored. Based on the challenge-hindrance stressor framework, we examined how work location (home versus office) and telework normativeness (prevalence and acceptance of hybrid work) moderate the effects of time pressure and professional isolation on work engagement and emotional exhaustion.

Design/methodology/approach. In this daily diary study, 124 employees completed an online questionnaire at the end of each workday for two consecutive workweeks, resulting in 609 observations.

Findings. Multilevel structural equation modeling revealed only a two-way interaction effect of work location and professional isolation on emotional exhaustion. Notably, adding telework normativeness as a moderator yielded significant three-way interactions for the remaining stressor-outcome relationships (time pressure-work engagement, professional isolation-work engagement, and time pressure-emotional exhaustion). However, the interaction patterns were mixed.

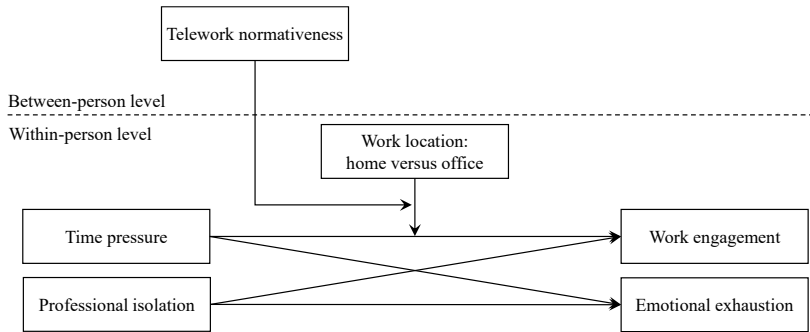
Practical implications. As hybrid work becomes more prevalent, organizations should design work environments that address both home and office settings and consider telework normativeness to effectively promote employee well-being. This study provides practical insights how to mitigate the negative effects of time pressure and professional isolation.

Originality. This study highlights the dynamic interplay between work context and employee outcomes within hybrid-work environments and provides insights from a within-person perspective.

4.2 Introduction

The rise of telework has prompted investigations into the effects of job characteristics on both home and office environments. Working from home is associated with benefits such as autonomy and reduced work-family conflict, but also drawbacks such as reduced social support and increased isolation, leading to mixed outcomes (Allen et al., 2015; Gajendran et al., 2024). However, previous research has primarily considered telework as a predictor of job characteristics and well-being, neglecting to examine how work location influences these relationships (Wang et al., 2021). With the significant shift toward telework due to the COVID-19 pandemic, this question has become increasingly relevant. The term “hybrid work” has emerged, emphasizing regular alternation between home and office work (Eurofound, 2022). This paradigm shift calls for re-evaluating existing findings, as studies conducted before or during the pandemic may not reflect the current work landscape. Moreover, past research mainly focused on between-person designs, failing to address intra-individual differences in the effects of working from home versus in the office (Charalampous et al., 2019; Vega et al., 2015).

Drawing on job demands-resources (JD-R) theory (Demerouti et al., 2001), this daily diary study examines how location-specific job demands affect well-being in hybrid-work contexts. We chose time pressure and professional isolation as demands relevant to hybrid-work contexts (Cavanaugh et al., 2000; LePine et al., 2004). Based on the challenge-hindrance stressor framework (Cavanaugh et al., 2000), we hypothesize that time pressure will positively relate to work engagement, while professional isolation will negatively relate to it. Both stressors are expected to positively relate to emotional exhaustion. We also examine how work location and telework normativeness moderate these relationships. Figure 9 illustrates the conceptual research model.

Figure 9*Conceptual Research Model*

Our study contributes to research and organizational practice in several ways. Theoretically, we advance the literature by grounding our hypotheses in the JD-R theory and providing a nuanced understanding of the effects of job characteristics on well-being in hybrid-work settings. By applying the challenge-hindrance stressor framework, we extend previous telework studies that overlooked the distinction between challenge and hindrance demands (cf. Rigotti et al., 2024). Furthermore, we bridge the research gap by investigating the moderating role of work location, moving beyond viewing telework as merely an antecedent. Because hybrid work has become more common, we also examine telework normativeness as a second moderator, suggesting location-specific effects vary with organizational telework prevalence.

Given the increasing prevalence of hybrid work, focusing on within-person variations in stressor effects dependent upon work location rather than general differences across individuals is important (Charalampous et al., 2019; Vega et al., 2015). Practically, our findings contribute to the understanding of the importance of work location on the effects of time pressure and professional isolation on well-being.

4.3 Theoretical Background

4.3.1 Time Pressure and Professional Isolation as Challenge and Hindrance Demands in Hybrid Work

The JD-R theory (Demerouti et al., 2001) provides a well-established framework for understanding the impact of job characteristics on employee well-being. Job characteristics are classified as demands or resources. Job demands require physical and/or mental effort, initiating an energy-draining, health-impairing process linked to emotional exhaustion. Job resources stimulate personal growth, learning, and development, initiating a motivational process that mitigates job demands and increases work engagement (Bakker et al., 2023; Demerouti et al., 2001). Considering the empirical evidence that job demands can have both negative and positive consequences, Cavanaugh et al. (2000) developed the challenge-hindrance stressor framework. Challenge stressors, such as workload and job responsibility, lead to strain, but can also foster personal growth and motivation. Hindrance stressors, such as role conflict and organizational politics, impede personal growth and goal attainment. Both types of stressors are linked to strain but affect work engagement differently, with challenge stressors showing a positive relationship, and hindrance stressors a negative relationship with work engagement (Crawford et al., 2010). Given the variability in job characteristics across work locations (Beckel & Fisher, 2022; Sardeshmukh et al., 2012), we draw on JD-R theory and challenge-hindrance stressor framework to explore the influence of hybrid-work environments. We focus on two specific job characteristics, time pressure and professional isolation, which fluctuate daily and are susceptible to hybrid work-conditions (Darouei & Pluut, 2021; de Vries et al., 2019).

Time pressure is characterized by the perception of insufficient time to complete tasks and the need to work faster (Baethge et al., 2018; Prem et al., 2018). While stressful, time pressure can also motivate employees to complete their tasks within a provided timeframe. When employees expect to overcome time pressure, they invest efforts rewarded by mastery and goal achievement. Thus, time pressure is a challenge stressor that can trigger both motivational and health-impairing processes (Crawford et al., 2010; LePine et al., 2005; Podsakoff et al., 2023). Consistent with previous studies (e.g., Baethge et al., 2018; Kunzelmann & Rigotti, 2021; Prem et al., 2018), we hypothesize the following:

Hypothesis 1: Time pressure is positively related to a) work engagement and b) emotional exhaustion.

Professional isolation, a social hindrance stressor (Scharp et al., 2021), refers to a sense of solitude and detachment from colleagues at work, often due to limited communication, social support, and casual interactions (Golden et al., 2008). While typically associated with home-based telework, isolation is not exclusive to teleworkers (Beauregard et al., 2019; Charalampous et al., 2019). Isolation can hinder employees' need for relatedness and ability to cope effectively with stressors, decreasing work engagement and increasing emotional exhaustion (Trépanier et al., 2015). Aligned with the motivation- and strain-related effects of hindrance stressors (Crawford et al., 2010), we hypothesize the following:

Hypothesis 2: Professional isolation is a) negatively related to work engagement and b) positively related to emotional exhaustion.

4.3.2 Moderating Role of Daily Work Location

The effects of job characteristics vary across contexts (Bakker & Sanz-Vergel, 2013; Morgeson & Campion, 2003). Working from home, with its quieter workspace and saved commuting time, can help manage time pressure (Wöhrmann & Ebner, 2021). Increased autonomy and schedule flexibility allow employees to align work with their productivity levels and effectively prioritize tasks. This can motivate them to invest effort to meet demands, strengthening the relationship between time pressure and work engagement. Conversely, office environments, characterized by co-worker distractions, face-to-face meetings, and less control over work schedules, may reduce the challenging potential of time pressure (Allen et al., 2015; Beauregard et al., 2019). These factors may reduce the likelihood of goal attainment and motivational gains, weakening the relationship between time pressure and work engagement.

Likewise, working from home can mitigate the health-impairing effects of time pressure and offer better recovery opportunities. Employees can use breaks to recuperate from the strain of managing time pressure (Biron & van Veldhoven, 2016). Greater autonomy and discretion at home, which buffer the demanding effects of time pressure, likely reduce emotional exhaustion (Gajendran et al., 2015).

Hypothesis 3: On days when employees work from home compared with the office, time pressure is a) more positively related to work engagement and b) less positively related to emotional exhaustion.

Regarding professional isolation, the home environment offers fewer resources to address this hindrance (Golden et al., 2008). Unlike time pressure, which can be alleviated through autonomy and a quiet workspace, professional isolation requires social support and interpersonal connections (de Jonge & Dormann, 2006). Compensating for the lack of social resources can be stressful and energy-draining, amplifying the adverse impact of professional isolation on work engagement and emotional exhaustion (Hobfoll et al., 2018). The absence of recognition and feedback exacerbates these effects (Sardeshmukh et al., 2012).

By contrast, office environments provide numerous social resources, such as support, immediate feedback, and face-to-face interactions, which help mitigate the health-impairing effects of professional isolation (Golden et al., 2008). This collaborative setting, coupled with opportunities for idea sharing and recognition, supports motivation and successful task accomplishment (van den Broeck et al., 2016). Additionally, organizational cues foster identification and commitment, while spontaneous interactions with colleagues enhance the sense of connection (Thatcher & Zhu, 2006). These factors buffer the adverse effects of professional isolation on work engagement and emotional exhaustion.

Hypothesis 4: On days when employees work from home compared with the office, professional isolation is a) more negatively related to work engagement and b) more positively related to emotional exhaustion.

4.3.3 Interplay between Time Pressure, Professional Isolation, Work Location, and Telework Normativeness

The post-pandemic shift of telework as a privilege to an organizational norm warrants an examination of its impacts (Rudolph et al., 2021; Wang et al., 2021). Therefore, we investigate the moderating role of telework normativeness, indicating the prevalence and acceptance of telework within an organization (Gajendran et al., 2015).

Regarding time pressure, the beneficial effects of working from home on work engagement and emotional exhaustion stem from decreased

demands and increased resources in this setting (Hypotheses 3a and 3b). These advantages may be more pronounced in low-telework organizations, where co-workers and managers are unacquainted with teleworkers and thus less aware of their availability (Golden & Eddleston, 2020). Consequently, employees working from home may have fewer meetings and work-related obligations, enhancing their ability to manage time pressure (Nakrošienė et al., 2019; Sardeshmukh et al., 2012). As part of a select group granted telework privileges, these employees may exhibit higher productivity and engagement in return for benefits (Kelliher & Anderson, 2010), representing better time-pressure management.

However, as telework becomes more common, it is no longer seen as an incentive. Consequently, telework advantages become less pronounced (Gajendran et al., 2015; Golden & Eddleston, 2020). In organizations with high telework normativeness, work processes are often designed to be location-independent, leading to a full work schedule and interruptions when working from home (Demerouti et al., 2014). This may diminish the strengthened relationship between time pressure and work engagement and the weakened relationship between time pressure and emotional exhaustion when working from home compared to the office. Therefore, we hypothesize that employees in low-telework normativeness organizations would benefit more from working from home to cope with time pressure.

Hypothesis 5: There will be a three-way interaction between time pressure, work location, and telework normativeness, such that the moderating effect of work location (home versus office) on the relationship between time pressure and a) work engagement and b) emotional exhaustion will be stronger for employees with low telework normativeness than for employees with high telework normativeness.

In contrast to time pressure, the detrimental effects of professional isolation on work engagement and emotional exhaustion are due to a lack of social resources (Hypotheses 4a and 4b). Low-telework normativeness organizations provide fewer social resources to counter professional isolation, since work routines and collaboration are not tailored to telework (Beauregard et al., 2019; Demerouti et al., 2014). Conversely, high-telework normativeness environments offer additional resources through standardized work processes and improved virtual communication. These

include collaboration tools and interpersonal interventions that encourage social interaction and prevent isolation, enabling employees to handle professional isolation more effectively than those in low-telework normativeness settings. Consequently, the stronger relationship between professional isolation and work engagement and emotional exhaustion on home days compared with office days might be attenuated for employees in high-telework normativeness settings. In sum, we expect the difference between work in the relationship between time pressure and work engagement and exhaustion will weaken as telework normativeness increases.

Hypothesis 6: There will be a three-way interaction between professional isolation, work location, and telework normativeness, such that the moderating effect of work location (home versus office) on the relationship between professional isolation and a) work engagement and b) emotional exhaustion will be stronger for employees with low telework normativeness than for employees with high telework normativeness.

4.4 Methods

4.4.1 Procedure and Participants

Participants were asked to complete a short online questionnaire for 10 consecutive workdays to ensure that data were captured on both home-based and office-based workdays. Participants filled out a general questionnaire to assess sociodemographic and telework-related information. The study received approval from the local ethics committee (2023-JGU-psychEK-S040).

We recruited 148 participants via social media and snowball sampling through private and professional networks, offering a raffle of 10 €25 vouchers as an incentive. For analysis, we included only questionnaires completed before midnight on days when participants spent at least 75% of their work hours at home or in the office. Further, we only included participants who provided at least two valid questionnaires. We excluded 24 participants who did not meet these inclusion criteria, resulting in a final sample of 124 participants with 609 daily questionnaires ($M = 4.91$, $SD = 1.96$).

The sample was 67.7% female, with a mean age of 38.92 years ($SD = 10.23$) and a mean organizational tenure of 13.70 years ($SD = 10.6$). Participants worked an average of 39.36 hours per week ($SD = 9.17$), with 44% ($SD = 23.43\%$) of their work hours being spent at home. Education levels were high, with 79% holding an academic and 7.3% a doctoral degree. Participants were employed across various sectors, with the largest proportions working in finance and insurance (32.3%), education (10.5%), healthcare (10.5%), services (8.9%), and administration (8.1%).

4.4.2 Measures

All study variables, except telework normativeness, were measured via daily questionnaires. All items were presented in German and rated on a 5-point Likert scale.

Challenge and Hindrance Stressors

Time pressure was assessed using three items from the time-pressure scale of the Instrument for Stress-Oriented Task Analysis (ISTA; Irmer et al., 2019). A sample item is “How often did you have to work faster than normal in order to complete your work?” Cronbach’s alpha at the within-person level was .87.

Professional isolation was measured using four items of Golden et al.’s scale (2008), including “Today, I missed informal interaction with others.” As no German version was available, it was translated into German and subsequently back-translated by a second bilingual speaker to ensure the equivalence of meaning in both languages (Klotz et al., 2023). Cronbach’s alpha at the within-person level was .84.

Moderating Variables

Work location was coded as a dummy variable: 0 = office and 1 = home, with a requirement of at least 75% of the work hours to be spent at the respective location. Participants indicated their daily work locations by recording the number of work hours they worked a) at the office, defined as the traditional company-based workplace, b) from home, and c) from other locations, which included business trips or irregular remote-work locations.

Telework normativeness was assessed by asking participants to estimate the percentage of their direct colleagues who worked from home and the average percentage of working time they spent at home, building on

Golden and Eddleston's (2020) approach. We multiplied these two estimates to obtain a single measure for telework normativeness that ranged from 0 to 1, where 0 indicated that none worked from home and 1 indicated that all worked from home 100% of the time.

Outcome Variables

Work engagement was measured using the three-item version of the Utrecht Work Engagement Scale (UWES-3; Schaufeli et al., 2019). The short version captures each dimension (vigor, dedication, and absorption) with one item, for example, "I am enthusiastic about my job." Cronbach's alpha at the within-person level was .85.

Emotional exhaustion was assessed with the corresponding burnout subscale of the German version of the Maslach Burnout Inventory (MBI-D; Büssing & Perrar, 1992). The subscale comprised three items, such as "Today, I felt burned out from my work." Cronbach's alpha at the within-person level was .68.

4.4.3 Data Analysis

Following Preacher et al. (2010), we applied multilevel structural equation modeling (MSEM) to account for the hierarchical structure of our diary data. Data analyses were conducted using Mplus version 7.3 (Muthén & Muthén, 1998-2014), employing two-level analysis and maximum likelihood estimation. The predictor variables (time pressure and professional isolation) and level-2 moderator variable (telework normativeness) were centered at the grand mean, while work location, a dichotomous variable, remained uncentered.

We conducted a series of MSEMs to test the hypotheses. First, we examined the main effects of time pressure and professional isolation on work engagement and emotional exhaustion (Model 1; Hypotheses 1 and 2). Next, we included work location as a level-1 moderator to test the two-way interaction effects (Model 2; Hypotheses 3 and 4). Last, we added telework normativeness as a level-2 moderator to assess three-way interaction effects (Model 3; Hypotheses 5 and 6). Significant interaction effects were further explored through simple slope analyses and interaction plots.

4.5 Results

4.5.1 Descriptive Statistics

Table 9 presents the means, standard deviations, proportions of variance, and correlations among the study variables. To determine if within-person variations justified multi-level analyses, we calculated intraclass correlation coefficients for all level-1 variables ranging from 48% to 79% (Table 9), confirming the appropriateness of using multilevel analyses.

4.5.2 Hypotheses Testing

Table 10 presents the results of the sequenced MSEMs. Model 1 fully supported the direct-effects hypotheses (H1 and H2). Time pressure was positively related to both work engagement and emotional exhaustion ($b = .13, p < .001$; $b = .11, p = .003$), supporting H1a, and H1b. Professional isolation was negatively related to work engagement and positively related to emotional exhaustion ($b = -.14, p = .004$; $b = .19, p < .001$), supporting H2a and H2b.

Model 2 tested the two-way interaction between either time pressure or professional isolation and work location on work engagement and emotional exhaustion (H3 and H4). No significant moderation effects were found for time pressure on work engagement ($b = -.01, p = .83$) or emotional exhaustion ($b = .01, p = .90$), nor for the interaction between professional isolation and work location on work engagement ($b = .08, p = .39$), rejecting H3a, H3b, and H4a.

However, a significant interaction effect was found between professional isolation and work location on emotional exhaustion ($b = .26, p = .005$). The interaction plot in Figure 10 and simple slope analyses indicated that the relationship between professional isolation and emotional exhaustion was positive when working from home (slope 1 = $.28, p < .001$), but not significant when working in the office (slope 2 = $.02, p = .80$), confirming H4b.

Table 9
Means, Standard Deviations, Within-Level Variances, and Correlations

	<i>M</i>	<i>SD</i>	1-ICC ^a	1	2	3	4	5	6
1. Time pressure	2.39	1.18	0.58	–	-.07	.16***	.12**	-.05	–
2. Professional isolation	1.45	0.56	0.58	.12	–	-.14**	.16***	.23***	–
3. Work engagement	3.08	0.76	0.65	.07	-.09	–	-.35***	-.12**	–
4. Emotional exhaustion	2.17	0.92	0.48	.57***	.24*	-.25*	–	.08	–
5. Work location ^b	0.51	0.25	0.79	.13	.09	.01	.06	–	–
6. Telework normativeness ^c	0.45	0.07	–	.09	-.03	.10	.11	.52***	–

Note: Correlations above the diagonal are within-person (level-1) correlations ($N = 609$). Correlations below the diagonal are between-person (level-2) correlations ($N = 124$).

^a ICC = intraclass correlation coefficient. 1-ICC refers to the percentage of the within-person variance.

^b Work location: 0 = working in the office, 1 = working from home.

^c Telework normativeness was assessed only at the between-person level (level 2).

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 10
Results of the Multilevel Structural Equation Models

	Work engagement						Emotional exhaustion					
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
<i>Direct effects</i>												
Time pressure (TP)	.13***	.04	.13*	.05	.14**	.05	.11**	.04	.13**	.05	.14**	.05
Professional isolation (PI)	-.14**	.05	-.17*	.08	-.19*	.08	.19***	.05	.02	.08	.02	.08
Work location ^a (WL)			-.14*	.07	-.10	.07			.08	.07	.07	.07
Telework normativeness ^b (TN)					.21	.36					-.15	.39
<i>Two-way interaction effects</i>												
TP x WL			-.01	.06	-.06	.06			.01	.06	.02	.06
TP x TN					-.01	.18					.34	.18
PI x WL			.08	.09	.09	.09			.26**	.09	.07**	.09
PI x TN					-.45	.25					-.14	.25
WL x TN					.28	.27					.29	.27
<i>Three-way interaction effects</i>												
TP x WL x TN					.49*	.23					-.48*	.24
PI x WL x TN					.93**	.33					-.36	.33

Note: *N* = 609 days (124 employees); *B* = unstandardized estimate; *SE* = standard error.

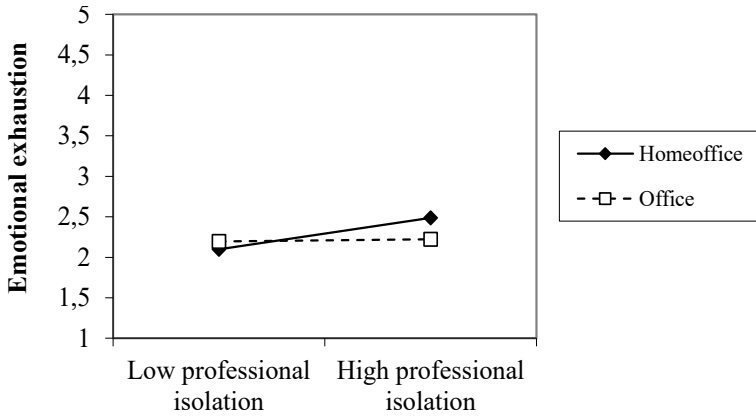
^a Work location: 0 = working in the office, 1 = working from home.

^b Telework normativeness is a between-person variable (level 2).

p* < .05; *p* < .01; ****p* < .001.

Figure 10

Two-Way Interaction of Professional Isolation and Work Location on Emotional Exhaustion



Model 3 examined the three-way interaction effects, introducing telework normativeness as a level-2 moderator (H5 and H6). Significant interaction effects were found for the relationships between time pressure and work engagement ($b = .49, p = .04$), time pressure and emotional exhaustion ($b = -.48, p = .04$), and professional isolation and work engagement ($b = .93, p = .003$).

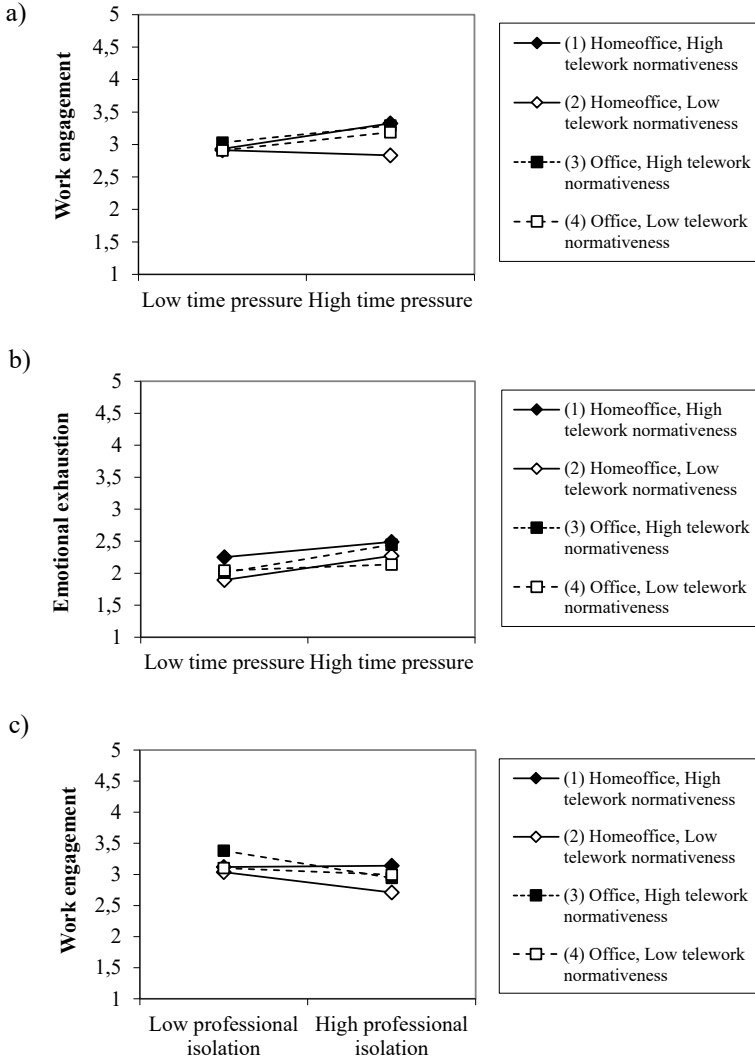
The difference in the relationship between time pressure and work engagement when working from home versus in the office was significantly stronger in low-telework settings compared with high-telework normativeness settings ($\Delta = (\text{slope 1} - \text{slope 3}) - (\text{slope 2} - \text{slope 4}) = .25, p = .04$). However, the direction was unexpected: Time pressure was less positively related to work engagement when working from home in low-telework normativeness settings (slope 1 = .20, $p < .001$; slope 2 = -.04; $p = .51$; Figure 11a). Thus, H5a was only partially supported. For the relationship between time pressure and emotional exhaustion, the difference between working from home and in the office varied significantly by telework normativeness ($\Delta = (\text{slope 1} - \text{slope 3}) - (\text{slope 2} - \text{slope 4}) = -.25, p = .04$). As expected, in high telework normativeness settings, time pressure was positively related to emotional exhaustion, regardless of work location (slope 1 = .12, $p = .02$; slope 3 = .23, $p = .002$; Figure 11b).

Contrary to our hypothesis, in low-telework normativeness settings, time pressure was positively related to emotional exhaustion when working from home, but not when working in the office (slope 2 = .19, $p = .003$; slope 4 = .05, $p = .45$; Figure 11b). Hence, H5b was partially supported.

The influence of work location on the relationship between professional isolation and work engagement differed between low- and high-telework normativeness ($\Delta = (\text{slope 1} - \text{slope 3}) - (\text{slope 2} - \text{slope 4}) = .48, p = .01$). In low-telework normativeness settings, the negative relationship between professional isolation and work engagement was more pronounced on home days than on office days (slope 2 = $-.23, p = .004$; slope 4 = $-.08, p = .43$; Figure 11c). Conversely, in high-telework normativeness settings, this relationship was less pronounced on home days than on office days (slope 1 = $.02, p = .85$; slope 3 = $-.31, p = .003$; Figure 11c), supporting H6a. Regarding the relationship between professional isolation and emotional exhaustion, the three-way interaction effect was not significant ($b = -.36, p = .28$), leading to the rejection of H6b.

Figure 11

Three-Way Interaction of Work Location, Telework Normativeness and a) Time Pressure on Work Engagement, b) Time Pressure on Emotional Exhaustion, and c) Professional Isolation on Work Engagement



4.6 Discussion

The rapid rise of hybrid work highlights the importance of understanding how job characteristics impact well-being and work outcomes when comparing work locations. Through a daily diary study, we examined the moderating effects of work location (home versus office) and telework normativeness (prevalence and acceptance of telework in organizations) on the relationships between time pressure, professional isolation, work engagement, and emotional exhaustion. Consistent with our expectations and the challenge-hindrance stressor literature (Bakker et al., 2023; Cavanaugh et al., 2000), time pressure positively related to both work engagement and emotional exhaustion, whereas professional isolation showed negative effects to work engagement, confirming their role as challenge and hindrance stressors. Work location only moderated the relationship between professional isolation and emotional exhaustion, with working from home exacerbating the detrimental effects. Notably, when considering three-way interactions, the interaction of professional isolation, work location, and telework normativeness on emotional exhaustion was the only non-significant effect.

Regarding the positive relationship between time pressure and work engagement, the difference between home and office days was more pronounced when telework normativeness was low, as predicted. We demonstrated that this difference diminished with increasing telework normativeness. However, contrary to expectations, the motivational effect of time pressure diminished when working from home in low-telework normativeness settings. This could be due to the absence of key resources such as social support and feedback, which foster work engagement (Sardeshmukh et al., 2012). According to JD-R theory (Bakker et al., 2023), job resources boost the positive effect of challenge demands. Consequently, when working from home, time pressure did not show its expected positive impact. Additionally, without others around to acknowledge their efforts, employees may feel exhausted, rushing through tasks without a sense of accomplishment.

Although we found a significant three-way interaction effect among time pressure, work location, and telework normativeness on emotional exhaustion, the slope differences for working from home and in the office were not significant in either low- or high-telework normativeness settings. Interestingly, the link between time pressure and emotional exhaustion was consistent when working from home, regardless of telework normativeness.

However, on office days, differences emerged: in high-telework normativeness organizations, time pressure was positively related to emotional exhaustion, while in low-telework normativeness organizations, there was no relationship. This suggests that in predominantly office-based environments, time pressure is perceived as less stressful.

We expected that high telework normativeness would mitigate the detrimental effects of professional isolation. As expected, at home, employees in low telework-normativeness organizations exhibited a stronger negative association between professional isolation and work engagement compared those in high-telework normativeness organizations. However, in high-telework normativeness settings, the negative relationship was more pronounced when working in the office. This may be because employees reserved office days for social interaction, and if colleagues worked from home, their expectations for social engagement were unmet, reducing their work engagement.

4.6.1 Theoretical Contribution

Our study advances the JD-R and telework literature by applying the challenge-hindrance stressor framework to the hybrid-work context using a daily diary design. We identified time pressure and professional isolation as key job demands in hybrid-work environments and examined their relationship with work engagement and emotional exhaustion, replicating the challenge and hindrance effects (Crawford et al., 2010; Galanti et al., 2021; Sardeshmukh et al., 2012). Our conceptual model provides a foundation for further research on how hybrid work affects the interplay between challenge-hindrance stressors and employee well-being.

Our study underscores the importance of within-person effects in the dynamic hybrid-work context. By employing a daily diary design, we captured daily fluctuations in job stressors and well-being outcomes, as well as transitions between home and office work. This approach extends existing research by revealing how work location moderates the relationship between professional isolation and emotional exhaustion. Additionally, our findings show that work location and telework normativeness jointly moderate the relationships between time pressure and work engagement, time pressure and emotional exhaustion, and professional isolation and work engagement. These diverse interaction patterns suggest a complex interplay between stressors, work location, and telework normativeness, offering avenues for future research.

4.6.2 Limitations and Suggestions for Future Research

As with any study, ours has limitations that future research could address. First, while the daily diary design is a strength, it does not allow causal conclusions. Although the MSEM paths imply directional relationships, longitudinal designs with repeated measures would provide more robust evidence of causal effects and reveal the long-term impacts of hybrid work.

Second, our data came from a convenience sample, a common approach in elaborate diary studies but one that introduces a risk of selection bias (Ohly et al., 2010). This method may have attracted participants enthusiastic about hybrid work, potentially overestimating its positive outcomes. Additionally, employees willing and able to work from home may differ from those who are not, causing confounding effects. Future research should aim for more diverse samples through targeted recruitment.

Third, our focus on subjective experiences of daily stressors and outcomes relied on self-reports, raising concerns about common method bias. To mitigate this bias, we used specific questionnaire instructions, repeated measures, and MSEM analyses. Nonetheless, future research could collect data from multiple sources, such as co-workers' and supervisors' ratings or physiological indicators, and at different times.

4.6.3 Practical Implications

With increasing hybrid-work arrangements, our findings offer valuable insights for organizational practices, emphasizing the need for interventions to mitigate the negative effects of time pressure and professional isolation. Since professional isolation's impact on work engagement and emotional exhaustion was consistent across work location, strategies to manage both stressors are required in home and office settings. Interventions could include training programs to improve self-organization and communication skills, team-building activities, and effective technological tools. Our study revealed that the three-way interaction between stressors, work location, and telework normativeness significantly predicted work engagement and emotional exhaustion. Thus, considering the acceptance and prevalence of telework within organizations is crucial. In addition to optimizing the home setting, organizations should not neglect adapting the traditional office. We recommend that employees and organizations analyze contextual factors to

effectively address job demands and resources in both home and office environments to promote employee well-being.

5. General Discussion

Driven by the paradigm shift toward hybrid-work models, which was accelerated by the COVID-19 pandemic, this dissertation's overarching aim was to examine the within-person effects of hybrid work on daily well-being. Significant changes in the work landscape, where alternating between home and office has become common for many employees, have intensified the ongoing debate on the benefits and challenges of telework. Thus, a more nuanced understanding of the factors moderating and mediating the effects of hybrid work is required. Grounded in the JD-R theory and SDT, this dissertation addresses these research gaps by integrating key telework aspects such as intensity, normativeness, daily voluntariness, and basic psychological need satisfaction into the research model. To examine this model, I conducted three empirical diary studies with data collection over 10 days to capture both home and office days. The main findings of each study are summarized in the following section. Next, the theoretical implications and limitations of the studies are discussed, followed by suggestions for future research. Finally, the chapter outlines the practical implications for organizations and presents the conclusion.

5.1 Summary of Findings and Research Objectives

Study 1 explored the within-person effects of work location (home versus office) on emotional exhaustion and perceived performance. Drawing on the JD-R model, I hypothesized that employees would experience lower emotional exhaustion when working from home than in the office, which would, in turn, enhance their perceived performance. To account for the dynamic changes in the evolving hybrid-work landscape—characterized by a) an increase in the amount of time spent teleworking, b) the prevalence and acceptance of telework in organizations, and c) the importance of the free choice of work location—I identified and tested a) telework intensity, b) telework normativeness, and c) daily telework as potential moderators. Results from the MSEM supported the hypotheses, showing that employees reported lower emotional exhaustion on days they worked from home compared to office days, which indirectly improved performance. As predicted, the differences in exhaustion between working from home and the office were more pronounced for employees who rarely worked from home, worked in organizations where telework was uncommon, or had limited freedom in choosing their work location.

Consequently, the indirect effect of work location on performance, mediated by exhaustion, was stronger for these employees compared to those with higher telework intensity, normativeness, and voluntariness.

Building on these insights, Study 2 aimed to elucidate the underlying mechanisms behind the direct effects of working from home versus in the office on well-being (work engagement and cognitive stress). The study focused on the indirect effects mediated by basic need satisfaction, as outlined by the SDT. I hypothesized that on days spent working from home, the need for autonomy and competence would be more satisfied, whereas the need for relatedness would be less satisfied, compared to days working in the office, which, in turn, would affect well-being. Using MSEM, the results indicated a negative relationship between working from home and cognitive stress but no significant effect on work engagement. However, basic need satisfaction mediated the effects of work location on both cognitive stress and work engagement. Working from home is associated with greater autonomy- and competence-need satisfaction, leading to increased work engagement and cognitive stress, whereas working from the office is associated with less relatedness-need satisfaction, resulting in decreased work engagement and cognitive stress. The moderated mediation model, with telework normativeness as the first-stage moderator, showed that the indirect effects of autonomy- and relatedness-need satisfaction were more pronounced when telework normativeness was low.

In contrast to Studies 1 and 2, Study 3 focused on work location as a moderator, rather than as a predictor. Based on the JD-R theory and the challenge-hindrance stressor framework, this study examined how working from home versus the office influences the motivational and health-impairing effects of time pressure (a challenge stressor) and professional isolation (a hindrance stressor) on work engagement and emotional exhaustion. I hypothesized that on days spent working from home, the positive relationship between time pressure and work engagement would be stronger, whereas its positive effect on emotional exhaustion would be weaker. Similarly, the negative relationship between professional isolation and work engagement, as well as the positive relationship with emotional exhaustion, was expected to be more pronounced when working from home. Although the direct effects were confirmed using MSEM, the two-way interaction effects were significant only for the relationship between professional isolation and emotional exhaustion. Notably, when telework normativeness was included as an additional moderator, the three-way

interactions revealed significant effects for the other stressor-outcome relationships (i.e., time pressure-work engagement, professional isolation-work engagement, and time pressure-emotional exhaustion) but not for the relationship between professional isolation and emotional exhaustion.

Overall, the results of the three studies address the dissertation's research objectives. The first research objective was to examine the effects of hybrid work on daily employee outcomes. Overall, employees experienced working from home as more beneficial than working in the office, in terms of perceived performance, emotional exhaustion, and cognitive stress, as well as autonomy- and competence-need satisfaction. As expected, days working from home were negatively related to relatedness-need satisfaction. Regarding work engagement, no significant effect was found, likely because of the countervailing effects of basic need satisfaction. These findings align with the second research objective, which examines the mediating role of basic need satisfaction. The results support the dual pathway of autonomy and competence needs, leading to positive outcomes and relatedness needs and negative outcomes when working from home. The third research objective is to examine the moderating role of telework aspects, revealing interaction effects across all moderators (i.e., telework intensity, telework normativeness, daily telework voluntariness, and daily work location), albeit with mixed patterns. This underscores the complexity of hybrid work dynamics and the influence of contextual factors on these relationships.

5.2 Theoretical Implications

This dissertation contributes to the understanding of the dynamic interplay between work location, job demands, basic need satisfaction, and well-being within the context of hybrid work. By integrating the JD-R theory, challenge-hindrance stressor framework, and SDT, this research offers novel insights into telework literature and organizational psychology research.

The studies' findings add to the ongoing debate on whether telework is a "good or bad thing" (Gajendran & Harrison, 2007, p. 1525). The results indicated a predominance of beneficial effects, as days spent working from home were associated with better performance, less exhaustion, and less cognitive stress compared to office days. This aligns with previous findings (e.g., Delanoije & Verbruggen, 2020; Sardeshmukh et al., 2012; Vega et al., 2015); however, considering the post-pandemic shift, pre-pandemic

studies may not fully capture the current reality. This dissertation goes beyond the simple question of whether telework is “good” or “bad.” By examining the mediating and moderating factors from a within-person perspective, this dissertation provides a deeper understanding of how and why hybrid work affects well-being. The studies systematically address the research gaps, identified in Chapter 1.1.2, “Critical Discussion on Telework Research,” including the lack of strong theoretical foundations in telework studies, predominant use of cross-sectional designs, and limited examination of mediating and moderating mechanisms. These aspects are discussed in the subsequent sections.

First, unlike several previous studies that lack a theoretical foundation, all studies within this dissertation are rooted in combinations of well-established theories, namely, the JD-R theory, challenge and hindrance stressor framework, and SDT. Existing research suggests that certain demands and resources may be inherent to work locations, such as autonomy, isolation, and support (Beauregard et al., 2019; Gajendran et al., 2024). This dissertation’s hypotheses are derived from these findings and expand the theoretical framework by incorporating mediating and moderating factors to explain why demand affects well-being and how specific telework aspects influence these relationships. Additionally, Study 3 presents time pressure and professional isolation as challenges and hindrance stressors within the hybrid-work context. Given the changing landscape of hybrid work, there is a need for a deeper understanding of location-specific job characteristics and how they are predicted by or interact with the work location. This perspective is crucial for developing targeted interventions that enhance the positive telework aspects while minimizing its drawbacks. Future research should follow up on the theoretical considerations and findings presented in this dissertation.

Second, the use of daily diary designs across all three studies provided methodological contributions. By capturing daily fluctuations in hybrid work, need satisfaction, and well-being, these studies offer a more nuanced understanding of these relationships compared to traditional between-person telework studies (Biron & van Veldhoven, 2016; Delanoëije & Verbruggen, 2020; Ohly et al., 2010). Previous within-person studies have indicated that work location leads to fluctuations in well-being and organizational outcomes. Specifically, on days when employees worked from home, they reported more positive and less negative affect (Anderson et al., 2015), higher job performance and job satisfaction (Vega et al., 2015), reduced

work-to-home conflict, and lower stress levels (Delanoëije & Verbruggen, 2019, 2020). Furthermore, working from home is associated with less time pressure (Müller & Niessen, 2019), a lower need for recovery, and an improved ability to concentrate (Biron & van Veldhoven, 2016), but with decreased organizational commitment and increased professional isolation (de Vries et al., 2019). The findings of this dissertation align with these insights and show that work location, job demands, and well-being outcomes vary daily, highlighting the importance of examining hybrid work from a within-person perspective. In addition, this dissertation considers the influence of contextual factors on hybrid work, providing further insights into existing within-person studies.

Third, by examining basic need satisfaction as a mediator in the relationship between work location and well-being outcomes, Study 2 further explains why hybrid work affects well-being. Although previous research has suggested that autonomy is a resource and that isolation is a demand in telework (Gajendran et al., 2024), indicating that working from home may satisfy the need for autonomy but dissatisfy the need for relatedness, this has not yet been empirically tested. The results showed that autonomy- and competence-need satisfaction were higher when working from home compared to the office. However, relatedness-need satisfaction was lower when working from home. These findings confirm the dual pathway of telework effects (Gajendran et al., 2024) and help explain the conflicting or null findings in telework research due to opposing mediating mechanisms. This was evident in Study 2, which showed no direct relationship between work location and work engagement; however, there was an indirect relationship between work location and work engagement through basic need satisfaction. Study 2 also contributes to the SDT by applying the theory to a novel hybrid-work environment in a within-person context, emphasizing the necessity of considering basic need satisfaction in telework research.

Fourth, this dissertation refines the existing knowledge of the influential factors in telework by identifying the key aspects that characterize the work conditions of employees who alternate between working from home and working in the office. Considering the changes entailed by the emergence of hybrid work, this dissertation demonstrates the significance of telework intensity, telework normativeness, and daily telework voluntariness as moderators. Cross-sectional studies have examined telework intensity and telework normativeness as moderators

(Allen et al., 2015; Chambel et al., 2023; Gajendran et al., 2015). However, this dissertation confirms their impact using a within-person study design, showing that the differences between working from home and working in the office diminish with increasing telework intensity and normativeness. Daily telework voluntariness is a novel contribution of this study. Prior research focused on the overall choice of telework, not on the daily choice of working from home or in the office (Kaduk et al., 2019; Lapierre et al., 2016). As Study 1 showed, telework voluntariness fluctuates daily, warranting further consideration in future studies. Feeling forced to work in the office was shown to negatively affect the relationship between work location and well-being.

In addition to identifying telework intensity, telework normativeness, and daily telework voluntariness as critical contextual factors, Study 3 revealed that work location influences stressor-well-being relationships. Given that work location may become more flexible in the future, this finding is important. In conclusion, telework intensity, telework normativeness, daily telework voluntariness, and work location require further attention in hybrid work research. By exploring these interaction effects, this dissertation provides a practically relevant and theoretically enriching contribution, particularly considering the significant changes in telework practices caused by the COVID-19 pandemic.

5.3 Strengths, Limitations, and Future Directions

Although this dissertation has several strengths, certain limitations need to be considered, which should be addressed in future research. First, this dissertation is grounded in the well-established JD-R model, and it integrates the SDT and the challenge-hindrane stressor framework with aspects of teleworking to provide a solid theoretical foundation. The JD-R model and challenge-hindrane stressor framework are well suited to the complexities of hybrid-work arrangements, in which job characteristics can vary depending on the work location (Rigotti et al., 2024; Sardeshmukh et al., 2012). However, although the hypotheses were based on location-specific job demands and resources from previous studies, the research model used in this dissertation did not incorporate job characteristics as mediators between work location and outcomes. In Study 3, challenge and hindrance demands were assessed as predictors, but were not analyzed as mediators. Consequently, future research should examine the mediating role of job characteristics relevant to the hybrid-work context such as autonomy,

support, feedback, isolation, time pressure, and interruptions (Table 2). Future studies should determine the specific hybrid work characteristics that predict basic need satisfaction. In addition, assessing the appraisal of job characteristics as resources, challenge or hindrance demands (Bakker & Demerouti, 2007; Kronenwett & Rigotti, 2022) may elucidate why some scholars classify telework as a job demand rather than resource (Abendroth & Reimann, 2018; Hoornweg et al., 2016). Moreover, examining both need satisfaction and frustration would provide a more comprehensive picture, as need satisfaction better predicts positive outcomes, such as motivation and engagement, whereas need frustration is likely to contribute more to negative outcomes, such as exhaustion and ill-being (Trépanier et al., 2015; Vansteenkiste et al., 2020).

Second, a major strength of all the three studies is their elaborate diary design. Data collection in natural settings ensured that participants completed questionnaires at their respective work locations, whereas daily assessment minimized recall bias. Repeated measurements allow for within-person analysis while controlling for individual differences such as person- or job-related factors (Bolger et al., 2003; Ohly et al., 2010). However, although the MSEM analysis suggests directional relationships, diary designs do not allow for causal inferences. Future studies should use longitudinal designs to provide more robust causal evidence and explore the reciprocal effects of outcomes on job stressors and choice of work location (cf. Guthier et al., 2020).

Third, the studies were conducted during a period of evolving hybrid work practices, offering new insights into the effects of working from home compared with pre-pandemic studies. However, the data were collected after mandatory work-from-home orders were lifted in Germany, raising questions about whether the participants had already fully adapted to the new work environment. Klonek et al. (2022) suggested that the pandemic led to behavioral changes in virtual teams, indicating the start of the post-transition phase in mid-2020. As hybrid work is a novel arrangement that requires ongoing adjustments, further longitudinal research is necessary to better understand its implications.

Fourth, the study benefited from a large sample size facilitated by convenience sampling. Although this approach offers advantages, it may limit the generalizability of the findings due to potential selection bias. Employees who readily engage in telework may differ from those who are unsuited for working from home or who have lower teleworking interest.

Although the focus on within-person effects reduces this concern, future research should aim for a more heterogeneous sample that includes employees from various occupations and organizational contexts.

Fifth, another limitation is the reliance on self-report measures, which increases the risk of common method bias (Podsakoff et al., 2003). Although subjective measurements were crucial for our research questions and more accurate for this context, future studies could further minimize common method bias by employing multiple sources and more objective measures, such as physiological indicators and co-worker or supervisor ratings, to mitigate this bias. Instructions, separate measures by response mode (e.g., Likert scales, open-ended questions, behavioral observations), and measurements at different time points could also be used. Additionally, focusing solely on person-focused outcomes may overlook the potential impacts on colleagues, supervisors, and organizations. Future research should assess outcomes at various levels, such as team performance, supervisor satisfaction, and organizational outcomes, to gain broader insights into the implications of hybrid-work arrangements.

Sixth, although telework variables were clearly defined and more accurate than those in previous studies (Allen et al., 2015; Golden & Eddleston, 2020), they have several limitations. Focusing solely on work location as one facet of hybrid work overlooks other important dimensions. For example, these studies did not consider alternative remote-work locations or the hybrid work mode (working from both locations on a single day versus working at only one location). Moreover, although the ability to choose where one works (place flexibility) is important, the ability to choose when one works (timing flexibility), which typically accompanies hybrid work, may be a more important driver of positive effects (Allen et al., 2015; Kossek & van Dyne, 2008). However, these studies did not distinguish between the two concepts. Therefore, further analysis is warranted on the key aspects of telework, including the timing and place of work, as well as new media technologies, to better understand its differential impacts (Demerouti et al., 2014). Furthermore, the moderating variables used in this study (telework intensity, normativeness, and daily voluntariness) represent broad aspects of telework. Future research could explore more specific aspects related to hybrid work, such as the frequency of interactions with colleagues and supervisors, home office environment conditions, and individual preferences, which may influence the relationship

between work location and outcomes (Beauregard et al., 2019; Beckel & Fisher, 2022; Gajendran et al., 2024).

Finally, individual differences, such as personality traits, self-control strategies and gender, were not considered in the studies. For example, introverted employees may better cope with isolation at home compared to extraverted employees, and those high in conscientiousness may manage to better organize their workdays independently at home (Kniffin et al., 2021; O'Neill et al., 2009). Similarly, the use of self-control strategies has shown to improve performance when working from home (Troll et al., 2022). Furthermore, research suggests that men and women use and experience telework differently, leading to potentially varying outcomes (Chung & van der Lippe, 2020).

5.4 Practical Implications

As hybrid-work arrangements continue to evolve, the findings of this dissertation are highly relevant to organizational practices. Overall, the studies' results indicate the beneficial effects of working from home, which are associated with improved performance, reduced exhaustion, and reduced cognitive stress. Organizations should encourage flexible work arrangements to maximize these benefits. However, full-time telework is not universally beneficial, given that job stressors, particularly isolation, can counteract positive outcomes (Gajendran et al., 2024). The results of Study 2 confirmed these dual pathways, as working from home was positively related to autonomy- and competence-need satisfaction and negatively related to relatedness-need satisfaction.

Furthermore, the findings emphasize the relevance of within-person variations in employee experience. Given that most employees alternate between work locations within a week rather than working exclusively from home, organizations should acknowledge these daily fluctuations. The flexibility of hybrid-work arrangements should be used to capitalize on the benefits of each work location. For example, employees may choose to work from home on days requiring greater concentration and flexibility, whereas office days could be reserved for collaborative tasks and social interactions.

To promote the adoption of hybrid-work arrangements and a supportive hybrid work culture, I propose the following recommendations for designing work and organizational policies (cf. Allen et al., 2015; Beckel & Fisher, 2022; Parker & Grote, 2022). First, a successful transition

to hybrid work requires a thorough analysis of both the home and office settings, considering job demands, resources, individual work preferences, and the dynamic interplay between these factors. Organizational policies and work design should be tailored to support the advantages and mitigate the disadvantages of each work location. This process requires collaboration between employers and employees to ensure job control and a mutual understanding of individual needs, shared goals, and potential implications for teams and organizations.

Second, as the beneficial effects of working from home can be attributed to the satisfaction of autonomy and competence needs, these needs should be fulfilled in both office and home settings. This includes strategies such as involving employees in decision making, encouraging ownership of work, setting clear objectives, and providing feedback and learning opportunities (Gagné et al., 2022). On office days, efforts should be made to enhance autonomy-need satisfaction through flexible scheduling and reduced micromanagement. Conversely, the detrimental effects of working from home can be attributed to a lack of relatedness-need satisfaction. Encouraging social interaction and virtual collaboration can prevent feelings of isolation and strengthen team spirit. Tools such as Microsoft Teams, Slack, and Zoom facilitate communication and collaboration in remote settings. It is crucial for supervisors and team members to maintain close contact and focus on information sharing and socialization, rather than closely monitoring work schedules (Kaplan et al., 2018; Shockley et al., 2021). At this point, I emphasize being mindful of excessive autonomy, which can overwhelm employees (Dettmers & Bredehöft, 2020). Telework shifts responsibility from the employer to the employee, potentially blurring work-life boundaries and causing mental overload (Charalampous et al., 2019; Krick et al., 2024). Therefore, it is important to monitor well-being and balance the advantages and disadvantages of each work location. Providing training and support for self-leadership, self-care, and digital skills help employees manage hybrid work challenges (Bakker et al., 2021; Krick et al., 2024; Müller & Niessen, 2019).

Third, these studies have consistently highlighted the moderating role of telework normativeness. In organizations where telework is uncommon (i.e., low telework normativeness), employees benefit more from working from home. However, as telework becomes more widespread and accepted (high telework normativeness), the differences between home and office

settings diminish. In environments with a high prevalence of telework, efforts should be focused on reducing the potential for isolation among employees. Similarly, employees who work from home less frequently (low telework intensity) experience greater emotional exhaustion on office days than on home days. However, higher teleworking intensity does not necessarily lead to better outcomes; rather, the differences between work locations may become less pronounced as teleworking intensity increases. Consequently, policies and interventions should address both office and home settings to optimize hybrid-work arrangements.

Fourth, the significance of the daily choice of work location, as highlighted in Study 1, underscores the need for a balance between flexibility and regulation. Isolation-preventing measures such as fixed team days in the office can conflict with autonomy-supporting measures such as the free choice of work location. This can be addressed by involving employees in decision-making processes and gaining commitment to regulations (Peters et al., 2014). The study results reflect the divergence between employer and employee perspectives on regulations, with employees feeling forced to come to their offices on certain days. Organizations should cultivate a hybrid work culture that leverages the benefits of both home and office environments, encourages employee participation, and fosters a sense of empowerment and commitment among employees. Employers should support working from home if there are no serious objections, whereas employees should acknowledge the benefits of telework and consider its impact on coworkers and the organization. Promoting the advantages of office work, such as face-to-face interaction, can make it attractive for employees to work in their offices voluntarily.

In conclusion, integrating these practical implications can help organizations effectively navigate the complexities of hybrid work by acknowledging the benefits and challenges of both remote and in-office work, addressing the satisfaction of basic psychological needs, and considering the contextual factors. Encouraging a balanced mix of home and office work can optimize well-being and performance. Organizations should continually evaluate and adapt their work arrangements to address employees' and organizations' evolving needs. By considering these insights and continuously improving hybrid work practices, organizations can foster a dynamic and supportive work environment that not only enhances employee well-being and performance but also ensures sustainable organizational success.

5.5 Conclusion

The COVID-19 pandemic has catalyzed a paradigm shift toward hybrid-work arrangements that combine home-based and traditional office settings as a standard practice. This dissertation examines the within-person effects of these hybrid-work models on employee well-being through the lens of key psychological theories, including the JD-R theory, challenge-hindrance stressor framework, and SDT. The findings from the three daily diary studies indicate that working from home has predominantly beneficial effects, such as improved performance, increased autonomy- and competence-need satisfaction, and decreased emotional exhaustion. However, working from home is negatively related to relatedness-need satisfaction, underscoring the countervailing mediating effects of basic need satisfaction in explaining the impacts of work location on employee well-being. In addition, contextual factors, including telework intensity, normativeness, and daily voluntariness, along with work location, emerged as critical moderating variables influencing the effects of hybrid work.

This dissertation enhances the theoretical understanding of hybrid work while offering practical recommendations for optimizing these models. As organizations adopt hybrid approaches, these findings provide valuable insights into creating healthy and effective hybrid-work environments. By understanding the nuanced effects of work location and its mediating and moderating variables, organizations can tailor their hybrid work policies to enhance employee well-being, basic need satisfaction, and organizational outcomes. These findings lay the foundation for further research on the complexities of hybrid work and encourage deeper investigations to support sustainable, flexible, and productive work practices.

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Appendices

Appendix A.

Overview of the Manuscripts Included in this Dissertation

Study 1

Bantz, T.M. & Rigotti, T. (under review). How Daily Work Location Affects Employees' Well-Being: The Moderating Role of Telework Intensity, Normativeness, and Daily Voluntariness. *Applied Psychology: An International Review*.

Author Contributions: T.M.B.: Conceptualization, methodology, data collection, formal analysis, writing – original draft. T.R.: Formal analysis, writing – review & editing, supervision.

Study 2

Bantz, T.M. & Rigotti, T. (under review). Why and When Does Hybrid Work Affect Daily Well-being? A Moderated Mediation Model of Basic-needs satisfaction and Telework Normativeness. *European Journal of Work and Organizational Psychology*.

Author Contributions: T.M.B.: Conceptualization, methodology, data collection, formal analysis, writing – original draft. T.R.: Formal analysis, writing – review & editing, supervision.

Study 3

Bantz, T.M. & Rigotti, T. (in preparation). Within-person Dynamics of Stressors and Well-being in Hybrid-work Arrangements: Examining the Moderating Effects of Work Location and Telework Normativeness.

Author Contributions: T.M.B.: Conceptualization, methodology, data collection, formal analysis, writing – original draft. T.R.: Formal analysis, writing – review & editing, supervision.

Appendix B.

German Summary

Zusammenfassung

Die COVID-19-Pandemie hat die Einführung hybrider Arbeitsmodelle, bei denen Mitarbeitende regelmäßig zwischen Homeoffice und Büro wechseln, erheblich beschleunigt. Dieser Wandel hat die Verbreitung des Arbeitens von zuhause erheblich gesteigert, was die moderne Arbeitswelt grundlegend verändert und kritische Fragen zu den psychologischen Implikationen aufwirft. Die bisherige Homeoffice-Forschung kommt zu gemischten Ergebnissen hinsichtlich der Auswirkungen auf das Wohlbefinden von Mitarbeitenden, was die Notwendigkeit unterstreicht, mediiierende und moderierende Faktoren zu untersuchen. Angesichts der zunehmenden Verbreitung hybrider Arbeitsmodelle mit häufigen Wechseln zwischen den Arbeitsorten, ist es zudem wichtig, den Fokus von between-person- auf within-person-Effekte zu verlagern.

Um diese Forschungslücken zu schließen, untersucht diese Dissertation die within-person Effekte hybrider Arbeit auf das Wohlbefinden von Mitarbeitenden anhand von drei empirischen Tagebuch-Studien. Basierend auf der Job-Demands-Resources-Theorie, dem Challenge-Hindrance-Stressor-Framework und der Selbstbestimmungstheorie wird die Dissertation von drei Forschungszielen geleitet. Erstens werden die direkten Effekte hybrider Arbeit auf die täglichen Arbeitsergebnisse und das Wohlbefinden der Mitarbeitenden untersucht, wobei der Fokus auf der within-person-Variabilität liegt. Zweitens wird die Befriedigung der psychologischen Grundbedürfnisse nach Autonomie, Kompetenz und sozialer Eingebundenheit als Mediator-Variable analysiert, um den Zusammenhang zwischen dem Arbeitsort und dem Wohlbefinden von Mitarbeitenden zu erklären. Drittens werden relevante Moderatoren im hybriden Arbeitskontext untersucht. Der Schwerpunkt liegt dabei auf zentralen Homeofficeaspekten: Die Zeit, die im Homeoffice verbracht wird (Homeoffice-Intensität), die Verbreitung und Akzeptanz von Homeoffice im Unternehmen (Homeoffice-Normativität) und die wahrgenommene Freiwilligkeit bei der täglichen Wahl des Arbeitsortes (tägliche Homeoffice-Freiwilligkeit), sowie die moderierende

Rolle des Arbeitsortes in der Beziehung zwischen Stressoren und dem Wohlbefinden.

Studie 1 untersuchte den direkten Effekt des Arbeitsortes auf die emotionale Erschöpfung sowie den daraus resultierenden indirekten Einfluss auf die wahrgenommene Leistung anhand von Tagebuchdaten von 151 Mitarbeitenden ($N = 876$ Beobachtungen). Die Ergebnisse von Multilevel-Strukturgleichungsmodellen (MSEM) zeigten, dass Mitarbeitende an Homeofficetagen weniger emotionale Erschöpfung und dementsprechend eine höhere Leistung wahrgenommen haben als an Bürotagen. Darüber hinaus wurden die moderierenden Rollen von Homeoffice-Intensität, Homeoffice-Normativität und die täglicher Homeoffice-Freiwilligkeit untersucht, die relevante Merkmale der sich verändernden hybriden Arbeitswelt widerspiegeln. Die bedingten indirekte Effekte zeigten, dass die Effekte stärker ausgeprägt waren, wenn Mitarbeitende seltener von zu Hause arbeiteten (geringe Homeoffice-Intensität), in Organisationen arbeiteten, in denen Homeoffice weniger verbreitet war (geringe Homeoffice-Normativität), oder weniger Wahlmöglichkeiten hinsichtlich ihres Arbeitsortes hatten (geringe tägliche Homeoffice-Freiwilligkeit).

In Studie 2 wurden die mediiierenden Mechanismen für den Einfluss des Arbeitsortes auf das Arbeitsengagement und die kognitive Beanspruchung untersucht. Der Fokus lag dabei auf der Rolle der Befriedigung der psychologischen Grundbedürfnisse. Basierend auf Tagebuchdaten von 114 Mitarbeitenden ($N = 744$ Beobachtungen) zeigten Multilevel-Mediationsmodelle, dass die Arbeit im Homeoffice mit einer höheren Befriedigung der Bedürfnisse nach Autonomie und Kompetenz verbunden war. Dies wirkte sich positiv auf das Arbeitsengagement aus und reduzierte die kognitive Beanspruchung. Demgegenüber war die Arbeit im Homeoffice mit einer geringeren Befriedigung des Bedürfnisses nach sozialer Eingebundenheit verbunden. Dies erhöhte ebenfalls das Arbeitsengagement und reduzierte die kognitive Beanspruchung. Multilevel-moderierte Mediationsmodelle zeigten zudem, dass Homeoffice-Normativität die indirekten Effekte der Befriedigung der Bedürfnisse nach Autonomie und sozialer Eingebundenheit abschwächte.

Studie 3 richtete den Fokus auf die moderierende Wirkung des Arbeitsortes auf die Beziehung zwischen Zeitdruck (einem Challenge-Stressor), beruflicher Isolation (einem Hindrance-Stressor) und Arbeitsengagement sowie emotionaler Erschöpfung. Die MSEM-Analyse

der Tagebuchdaten von 124 Mitarbeitenden ($N = 609$ Beobachtungen) ergab eine signifikante Zweifachinteraktion zwischen Arbeitsort und beruflicher Isolation in Bezug auf emotionale Erschöpfung. Wie in den Studien 1 und 2 wurde auch in dieser Studie die moderierende Rolle der Homeoffice-Normativität untersucht. Hier zeigten sich signifikante Dreifachinteraktionen von Arbeitsort, Homeoffice-Normativität und den Stressoren, die sowohl den Zusammenhang zwischen Zeitdruck und Arbeitsengagement bzw. emotionaler Erschöpfung als auch zwischen beruflicher Isolation und emotionaler Erschöpfung beeinflusste, wobei gemischte Interaktionsmuster auftraten.

Insgesamt untersuchten diese Studien umfassend die psychologischen Dynamiken hybrider Arbeit. Die Ergebnisse unterstreichen die Bedeutung von within-person-Effekten und die Notwendigkeit, sowohl mediierende Faktoren wie die Befriedigung grundlegender Bedürfnisse als auch moderierende Faktoren wie die Intensität, Normativität und Freiwilligkeit von Homeoffice in die Betrachtung der Mitarbeitendenergebnisse einzubeziehen.

Die praktischen Implikationen dieser Ergebnisse sind für Unternehmen, die sich mit der Zukunft der Arbeit befassen, von großer Bedeutung. Sie bieten wertvolle Hinweise zur Förderung und Gestaltung hybrider Arbeitsformen. Die Dissertation unterstreicht, wie wichtig es ist, flexible Arbeitsregelungen zu fördern, die die Autonomie und Kompetenz von Mitarbeitenden stärken und gleichzeitig negative Auswirkungen wie Isolation aktiv mindern. Dabei ist außerdem entscheidend, die Verbreitung von Homeoffice innerhalb einer Organisation zu berücksichtigen und die Vorteile von Homeoffice- und Büroarbeit gleichermaßen in Betracht zu ziehen, um ein unterstützendes und produktives hybrides Arbeitsumfeld zu gewährleisten.

Appendix C.**Declaration on the Doctoral Examination Procedure****ERKLÄRUNG**

**gemäß § 6 Absatz 2 f) der Promotionsordnung
der Fachbereiche 02, 05, 06, 07, 09 und 10 vom 04. April 2016**

Name: Bantz (geb. Müller)

Vorname: Theresa Maria

Haben Sie sich bereits früher einem Promotionsverfahren unterzogen?

Nein Ja

Wenn ja,

an welcher Universität?

zu welchem Zeitpunkt?

und mit welchem Erfolg?

**Haben Sie die vorgelegte schriftliche Prüfungsleistung oder Teile
daraus in einem anderen Verfahren zur Erlangung des Doktorgrades
oder eines sonstigen akademischen Grades oder einer anderen Prüfung
eingereicht bzw. bereits früher eingereicht?**

Nein Ja

Mainz, _____

Unterschrift

Appendix D.
Declaration of Authorship

ERKLÄRUNG

**gemäß § 6 Absatz 2 g) und gemäß § 6 Absatz 2 h) der
Promotionsordnung
der Fachbereiche 02, 05, 06, 07, 09 und 10 vom 04. April 2016**

Name: Bantz (geb. Müller)
Vorname: Theresa Maria

Hiermit erkläre ich, dass ich die eingereichte Dissertation selbständig, ohne fremde Hilfe verfasst und mit keinen anderen als den darin angegebenen Hilfsmitteln angefertigt habe, dass die wörtlichen oder dem Inhalt nach aus fremden Arbeiten entnommenen Stellen, Zeichnungen, Skizzen, bildlichen Darstellungen und dergleichen als solche genau kenntlich gemacht sind.

Von der Ordnung zur Sicherung guter wissenschaftlicher Praxis in Forschung und Lehre und zum Verfahren zum Umgang mit wissenschaftlichem Fehlverhalten habe ich Kenntnis genommen.

Meine Erklärung bezieht sich auf Schriften, die ich als alleinige Autorin eingereicht habe oder bei Ko-Autorenschaft auf jene Teile, für die ich mich verantwortlich zeichne.

Ich habe keine Hilfe von kommerziellen Promotionsberatern in Anspruch genommen.

Mainz, _____

Unterschrift

Appendix E.
Curriculum Vitae

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Appendix F.
Educational Background

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