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**MUCH ADO ABOUT WORKING:
THE FUTURE OF WORK IN THE POST-PANDEMIC ERA**

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Abstract

In the wake of the COVID-19 pandemic, the landscape of work has undergone a profound transformation, challenging traditional notions of workplace dynamics and employee experiences. This doctoral thesis explored the multifaceted nature of these changes, investigating the intricate interplay among remote work, individual differences, leadership styles, and emerging technologies.

The research journey begins with an examination of remote work attitudes during the height of the pandemic lockdowns in Italy. Drawing on data from 1,861 workers, this study highlights the role of both organizational (e.g.: trust in immediate managers) and individual (e.g.: gender) factors in shaping positive remote work experiences and mitigating stress.

Building on these insights, we turned our attention to the role of individual differences in workplace well-being. The second study, involving 317 employees from two medium-large Italian companies, explores how environmental sensitivity interacts with leadership styles to influence employee well-being, revealing that highly sensitive individuals are particularly responsive to supportive leadership practices.

The third study, involving 1,049 US workers, explores the factors influencing the adoption of Virtual Reality (VR) technology in the workplace, uncovering a nuanced role of trust.

Finally, a pilot study conducted on 36 participants in virtual teams examines the potential of chat-based structuring interventions in enhancing electronic brainstorming sessions. Although the results did not reach statistical significance, they hint at the promise of such interventions for improving idea quality in virtual collaborative environments.

Taken together, these studies paint a picture of the evolving world of work and underscore the critical importance of trust, leadership, and individual differences in shaping workplace experiences and technology adoption in the post-pandemic era.

Keywords: *remote work, job stress, environmental sensitivity, managerial trust, technology adoption, virtual teams*

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Introduction

On 30 January 2020, the World Health Organization declared COVID-19 a public health emergency of international concern. Less than two months later, on 11 March 2020, the COVID-19 outbreak was officially a pandemic (WHO, 2020). And just like that, the world as we knew it had changed.

The year 2020 ushered in an era where dining tables became boardrooms, pajamas became business casual, and ‘You’re on mute’ became the catchphrase of the decade. The pandemic didn’t just reshape our social lives; it revolutionized our relationship with work, transforming it from a place we go to something we do (Kniffin *et al.*, 2021).

The pandemic has acted as a global reset button for our work lives, pushing conversations about work-life balance, mental health, and job satisfaction from water cooler small talk to boardroom imperatives (Rudolph *et al.*, 2021).

But as we navigate this brave new working world, we’re discovering that the map is far more complex than we imagined. The one-size-fits-all approach to work that has dominated since the Industrial Revolution is crumbling under the weight of individual expectations and diverse needs. As Bain & Company’s ‘The Working Future’ report aptly puts it, ‘The average worker is no longer a useful approximation’ (Schwedel *et al.*, 2022).

Indeed, we’re witnessing the dawn of a new era - one where work is not just about earning a living, but about living a life. An era where employees are not just cogs in a machine, but individuals with unique needs, aspirations, and working styles. An era that demands a fundamental rethinking of how we approach work, leadership, and organizational structure (Gratton, 2021; Ozimek, 2020; Lim, 2023).

Because this is the question: not just *how* we work, but *why* we work, and what work means in the grand tapestry of our lives.

This dissertation examines the evolving landscape of work in the post-pandemic era, focusing on three critical aspects: the impact of mandatory remote work during the COVID-19 pandemic, the role of individual differences in job stress and leadership effectiveness, and the adoption of emerging technologies in the workplace. By investigating these interrelated themes, this research aims to provide a comprehensive understanding of the future of work and offer insights for organizations navigating this new terrain.

The rest of this introduction is structured to provide a comprehensive context for these investigations:

Section 1, “*All the World's a (Home) Office: The Shifting Stage of Work*,” examines the transformation of the working world from the onset of the COVID-19 pandemic to the present day, establishing the foundational context for our research and highlighting the rapid and significant changes in work practices and environments.

Section 2, “*The Taming of the Crew: Understanding Workers’ Needs and Wants*,” addresses the paradigm shift in perceiving workers not merely as operational components but as multifaceted individuals with distinct needs, values, and motivations, underscoring the importance of a holistic approach to employee management and engagement.

Section 3, “*The Merchant of Venice... and London, and New York: Global Collaboration in the Digital Age*,” focuses on the impact of emerging technologies on an increasingly interconnected, remote, and digitalized workforce, exploring the challenges and opportunities presented by global digital collaboration.

Building upon this contextual framework, the subsequent chapters present three observational studies and a pilot study that employed comprehensive questionnaires to gather data on employee experiences, attitudes, and behaviors across related yet distinct areas.

Chapter 1, “*Work in the Time of COVID-19*,” will examine the effects of and attitudes towards mandatory remote work among Italian workers during the lockdowns of 2020 and 2021. The chapter is based on the original research paper: Onesti G., Bellante F., Palumbo R. (2024), “Assessing Working Attitudes of Remote Workers to Enhance Management Control System: A Case Study of COVID-19 Lockdowns in Italy”, *Management Control*.

Chapter 2, “*Sense and Sensitivity*,” will investigate the role of Environmental Sensitivity in the workplace, focusing on its interaction with leadership styles, job stressors, and subjective well-being, by analyzing employees’ answers to a comprehensive questionnaire conducted in two medium-large sized Italian companies in 2022. The chapter is based on the original research paper: Onesti G., Bellante F., Lionetti F., Fasolo M., Palumbo R., (2024), “The Interplay Among Environmental Sensitivity, Job Stressors, and Leadership Styles on Employee Well-being”, *Scientific Reports*, 14.

Chapter 3, “*Ready Worker One*,” presents recent research conducted in the Summer of 2024, involving over one thousand US workers and examining the role of trust—in technology, in the organization, and immediate supervisors—in the acceptance of Virtual Reality (VR) technology in the workplace. The chapter is based on an original research paper by Bellante, F., Rosati, P., van der Werff, L. and Palumbo, R., currently under elaboration and soon to be submitted to the *European Journal of Information Systems*.

Chapter 4, “*Great (virtual) Expectations*,” presents a pilot study conducted in the early months of 2024 on creativity in virtual teams and Electronic Brainstorming.

The thesis concludes with a synthesis of findings, theoretical and practical implications, and directions for future research, providing a comprehensive examination of the future of work in the post-pandemic era.

1. All the World’s a (*Home*) Office: the Shifting Stage of Work

The COVID-19 pandemic has dramatically reshaped the global workplace, transforming traditional office-centric work cultures into distributed, digitally connected networks of remote workers. However, the pandemic has not only transformed work practices but has also significantly impacted human capital development and utilization. As Becker’s (1962) human capital theory suggests, the shift to remote work and the adoption of new technologies have profound implications for skill development and the valuation of different forms of human capital in the post-pandemic economy.

Recent data from the OECD (2021) indicates that the pandemic has accelerated the demand for digital skills across all sectors. In the EU, 90% of workplaces now require at least basic digital skills, up from 85% in 2019. This rapid digitalization has created a skills gap, with 64% of adults lacking basic digital skills (European Commission, 2020). Consequently, the nature of human capital investment is shifting, with a greater emphasis on digital competencies and adaptability.

Furthermore, the pandemic has exacerbated existing inequalities in human capital development. According to the World Bank (2023), the pandemic-induced learning losses could lead to a 10% decrease in lifetime earnings for today’s students in low and middle-income countries. In contrast, workers in high-skill, telework-compatible jobs have

often seen increased opportunities for skill development and career advancement during this period (Eurofound, 2022b).

1.1 The remote revolution

The concept of remote work, also described as “telework” or “telecommute”, is not novel. In 1973, Jack Nilles coined the term “telecommuting” while working on a NASA communication system (Nilles, 1975). Futurist Alvin Toffler (1980) further popularized the idea in his book “The Third Wave,” predicting a future where workers would be freed from the constraints of traditional offices. Despite these early visions, widespread adoption of remote work remained limited until the COVID-19 pandemic dramatically reshaped the global workplace (Kniffin *et al.*, 2021).

According to Eurofound data, the percentage of employees working from home in the EU rose sharply from 5% in 2019 to 12% in 2020. This figure peaked in the summer of 2020, with nearly half (48%) of employees working from home at least some of the time and 34% of employees working exclusively from home (Eurofound, 2022b; Schwedel *et al.*, 2022). As the pandemic progressed, we witnessed a gradual shift towards hybrid work arrangements (see Table 1) and, by spring 2022, only 12% were working exclusively from home, while hybrid work gained ground (Eurofound, 2022a).

Table 1: Remote Work Prevalence in EU (2020-2022). Elaboration on Eurofound data.

Work Location	2020	2021	2022
Exclusively from home	34%	25%	12%
Hybrid work	14%	18%	18%
Exclusively at the employer’s premises	52%	59%	69%

Employee preferences have also evolved throughout this period. In the early stages of the pandemic, many workers appreciated the flexibility and safety of remote work. Eurofound surveys revealed that in Summer 2020, 78% of employees indicated a preference for working from home at least occasionally if there were no COVID-19

restrictions (Eurofound, 2020). This preference persisted into 2022, with over 60% of both women and men expressing a desire to work from home at least several times per month (Eurofound, 2022).

These trends align with earlier research on telecommuting (e.g.: Gajendran & Harrison, 2007), which found that telework was associated with positive outcomes such as increased job satisfaction, performance, and lower work-family conflict. However, it was also noted that high-intensity telecommuting (more than 2.5 days a week) could harm relationships with co-workers, highlighting the potential benefits of hybrid arrangements that have gained popularity post-pandemic.

1.2 The dark side of remote work

While remote work offers numerous benefits, it also presents significant challenges that have been documented both before and during the COVID-19 pandemic. Pre-pandemic research identified several drawbacks associated with telework, including work intensification (Felstead & Henseke, 2017), professional isolation (Cooper & Kurland, 2002), and work-family conflict (Haar *et al.*, 2014). The rapid and widespread adoption of remote work during the pandemic exacerbated some of these issues and introduced new challenges.

Remote workers often experienced longer working hours and increased work intensity (Eurofound, 2020), with the boundaries between work and personal life becoming increasingly blurred (Wang *et al.*, 2021). The sudden shift to remote work also highlighted technological challenges, with many employees struggling to adapt to new digital tools and platforms (Molino *et al.*, 2020). Moreover, the lack of face-to-face interaction led to communication difficulties and reduced social support from colleagues (Waizenegger *et al.*, 2020).

The pandemic-induced remote work also raised concerns about employee well-being. Increased levels of stress, anxiety, and burnout were reported among remote workers (Oakman *et al.*, 2020), often linked to factors such as social isolation, increased workload, and the challenges of balancing work and family responsibilities (Carnevale & Hatak,

2020). Additionally, issues related to privacy and surveillance emerged as organizations sought to monitor employee performance in remote settings (Bhave *et al.*, 2020).

These challenges can be effectively analyzed through the lens of the Job Demands-Resources (JD-R) theory (Bakker & Demerouti, 2007), which posits that job characteristics can be classified into two categories: job demands and job resources. Job demands are aspects of the job that require sustained physical or mental effort and are associated with certain physiological and psychological costs. Job resources, on the other hand, are aspects that help achieve work goals, reduce job demands, or stimulate personal growth and development.

In the context of remote work, new job demands have emerged, such as the need for self-management, increased reliance on technology, and the blurring of work-life boundaries. Simultaneously, remote work has introduced new job resources, including increased autonomy and flexibility. However, it has also potentially reduced certain resources, such as face-to-face social support from colleagues and supervisors.

The balance between these new demands and resources can significantly impact employee well-being and performance. When job demands are high and job resources are low, employees are at risk of burnout and disengagement. Conversely, when job resources are sufficient to meet job demands, employees are more likely to experience work engagement and job satisfaction (Bakker & Demerouti, 2017).

1.2.1 The erosion of work-life boundaries

Remote workers frequently report a sense of being ‘always on’ or perpetually available (Galanti *et al.*, 2021). This constant connectivity can make it difficult to mentally and emotionally detach from work, potentially leading to increased stress and burnout. Eurofound (2022b) found that up to 40% of teleworkers in some countries reported difficulties in maintaining boundaries between work and personal life.

The struggle to disconnect during non-working hours has become a prevalent issue, with many employees feeling compelled to respond to work-related communications outside of their regular working hours (Messenger *et al.*, 2017). This ‘always connected’ culture can lead to longer working hours and work intensification: according to Eurofound

data (2020), 27% of those working from home reported working in their free time to meet work demands, compared with 18% of those working only at the employer's premises.

The erosion of work-life boundaries can have serious implications for employee well-being and job satisfaction, as poor work-life balance has been associated with increased stress, decreased job satisfaction, and higher turnover intentions (Haar *et al.*, 2014). Moreover, the inability to disconnect from work can also negatively impact personal relationships and overall quality of life (Sardeshmukh *et al.*, 2012).

In response to these challenges, some countries have implemented "Right to Disconnect" laws. For instance, France passed such legislation in 2017, giving workers the legal right to avoid work emails outside working hours (Secunda, 2019). In Italy, the right to disconnect was first introduced in 2017 as part of the "Agile Working Law" (Law No. 81/2017), which regulates flexible work arrangements. Specifically, Article 19 of the law states that the individual agreement between the employer and the employee must specify the technical and organizational measures necessary to ensure the employee's disconnection from work equipment (Eurofound, 2022b). The "Protocol on Agile Work" signed by the government and social partners in December 2021 reinforced the importance of the right to disconnect, emphasizing that it should be an integral part of smart working agreements (Eurofound, 2022a).

Despite these legal frameworks, however, the effectiveness of such measures in the context of remote work remains a topic of ongoing research and debate, particularly given the challenges of enforcement in home-based work settings.

1.2.2 Social isolation

Another significant drawback of remote work is the potential for social and professional isolation. This issue, which was identified in early telework research (Cooper & Kurland, 2002), has become more pronounced with the widespread adoption of remote work during the COVID-19 pandemic. Remote workers often experience a sense of professional isolation, often feeling detached from the company culture (Eurofound, 2022b), disconnected from workplace developments and missing out on informal learning opportunities (Charalampous *et al.*, 2019), as well as career development and progression

(Wang *et al.*, 2021). This reduced organizational attachment can lead to lower commitment and increased turnover intentions (Kniffin *et al.*, 2021).

Moreover, the lack of face-to-face interactions and casual, informal encounters in remote work settings can impede effective communication and collaboration, potentially affecting team cohesion and knowledge sharing (Rockmann & Pratt, 2015; Waizenegger *et al.*, 2020). Empirical evidence from Eurofound investigations supports these concerns. In a study conducted during the pandemic, 12% of survey respondents reported they felt isolated ‘always’ or ‘most of the time’ when working remotely. This effect was more pronounced among younger workers, with 15% of those aged 18-34 reporting feelings of isolation, compared to 12% of those aged 35-49 and 9% of those aged 50 and over (Eurofound, 2020).

The issue of isolation appears to be more severe for those working exclusively from home. According to Eurofound data (2020), 15% of employees working solely from home reported feeling isolated, compared to 10% of those working from other locations, suggesting that hybrid work arrangements might help mitigate some of the isolation associated with full-time remote work. The isolation experienced by remote workers can have significant psychological impacts, such as increased feelings of loneliness and decreased job satisfaction (Oakman *et al.*, 2020) and, in the long term, mental health issues such as depression and anxiety (Toscano & Zappalà, 2020).

1.2.3 Techno-stress

The heavy reliance on technology in remote work environments introduces its own set of challenges, with techno-stress emerging as a significant concern. Techno-stress, defined as the stress induced by information and communication technologies, has been significantly associated with work-family conflict and behavioral stress among remote workers (Molino *et al.*, 2020). This phenomenon is not new, but the pandemic-induced shift to remote work has intensified its prevalence and impact.

Remote workers often face a constant barrage of digital communications, leading to information overload and difficulties in managing work-related technologies. This increased technological dependence can result in higher levels of exhaustion and burnout

(Sardeshmukh *et al.*, 2012). The pressure to be constantly available and responsive, facilitated by smartphones and other mobile devices, further exacerbates this issue, blurring the lines between work and personal time (Tarafdar *et al.*, 2015).

The constant use of video conferencing tools has given rise to a specific form of techno-stress known as “Zoom fatigue.” This phenomenon, where prolonged video calls lead to feeling tired, worried, or burnt out, has become increasingly prevalent in the remote work landscape (Bailenson, 2021). The cognitive load associated with video conferencing, including increased self-awareness and the need to process non-verbal cues in a digital format, contributes to this fatigue (Fauville *et al.*, 2021).

Moreover, technical issues and the need to rapidly adapt to new technologies can be significant sources of stress for remote workers. Those with lower levels of technological self-efficacy may experience higher levels of techno-stress, potentially leading to reduced job satisfaction and increased turnover intentions (Ragu-Nathan *et al.*, 2008). The digital divide, both in terms of access to technology and digital skills, has become more pronounced in the context of widespread remote work, potentially exacerbating inequalities in the workforce (Beaunoyer *et al.*, 2020).

1.2.4 The Big Boss is watching you

The shift to remote work has led to an increased adoption of digital tools for performance monitoring, raising significant concerns about employee privacy and autonomy. This heightened surveillance in remote work environments resembles a “Big Brother” scenario, evoking Orwellian notions of constant observation (Ball, 2010; Jeske & Santuzzi, 2015).

Prior to the pandemic, electronic performance monitoring was already a growing trend, with potential negative impacts on employee well-being and job satisfaction (Jeske & Santuzzi, 2015). However, the rapid transition to remote work during the COVID-19 pandemic has accelerated and intensified this trend, introducing new challenges and ethical considerations.

Many organizations have implemented various forms of digital surveillance to monitor remote workers, including tracking software, keystroke logging, and webcam monitoring.

The impact of this surveillance on employee well-being and productivity is significant. Eurofound (2022b) reported that for almost half of the employees, this monitoring was seen as a sign of mistrust that negatively affected work motivation. This perception of being constantly watched can lead to increased stress, reduced job satisfaction, and diminished organizational commitment (Bhave *et al.*, 2020).

Moreover, electronic monitoring can create a sense of powerlessness among employees and erode the trust between workers and their employers. Research has shown that invasive monitoring practices can lead to counterproductive work behaviors, as employees attempt to circumvent or resist surveillance measures (Martin *et al.*, 2016). Organizations face the challenge of balancing their need for oversight and productivity measurement with respecting employee privacy and fostering a culture of trust. Some companies have explored alternative approaches, such as output-based performance evaluation or trust-based management systems, which focus on results rather than monitoring work processes (Felstead & Henseke, 2017).

1.2.5 Flexibility stigma

The shift to remote work has brought to the forefront a long-standing issue in organizational culture: the *flexibility stigma*, which refers to the negative perceptions and career consequences faced by workers who take advantage of flexible work arrangements (Williams *et al.*, 2013). The concept of flexibility stigma predates the pandemic, with research showing that workers who utilized flexible arrangements often faced career penalties. A study by Leslie *et al.* (2012) found that managers viewed employees who worked flexibly as less committed to their jobs, leading to lower performance evaluations and fewer promotions.

Unsurprisingly, flexibility stigma is deeply intertwined with gender dynamics in the workplace. Women, particularly mothers, are more likely to seek flexible work arrangements and, consequently, more likely to face associated penalties (Stone & Hernandez, 2013). This gender disparity in flexibility stigma contributes to the persistence of the gender wage gap and the underrepresentation of women in leadership positions. Interestingly, men who seek flexibility, especially for family reasons, often face even

harsher stigma, as they violate both work devotion and masculinity norms (Vandello *et al.*, 2013).

The pandemic has brought new dimensions to the flexibility stigma. While remote work became a necessity for many, disparities in who could work remotely and how they were perceived emerged. Workers in sectors that could not shift to remote work often viewed remote workers as privileged or not doing “real work” (Kramer & Kramer, 2020); while, within organizations, those who returned to the office earlier or more frequently were sometimes perceived as more committed, potentially disadvantaging those who continued to work remotely due to health concerns or caregiving responsibilities (Correll *et al.*, 2014).

Moreover, the flexibility stigma intersects with other forms of workplace discrimination, as research has shown that racial and ethnic minorities, as well as workers with disabilities, face greater challenges in accessing and benefiting from flexible work arrangements (Kossek & Lautsch, 2018).

1.3 Employees’ winter of discontent

Predictably, such abrupt changes and novel challenges had a complex and multifaceted impact on employees’ well-being. Eurofound’s data (2022b) shows fluctuations in mental well-being throughout the pandemic, which decreased from April 2020 to spring 2021, before slightly improving in spring 2022, suggesting initial challenges in adapting to remote work, followed by a gradual improvement as workers and organizations adjusted to new ways of working.

According to a survey conducted by Bain & Company, 58% of workers across 10 major economies feel the pandemic has forced them to rethink the balance between their work and personal lives (Schwedel *et al.*, 2022). This widespread reassessment of priorities is reshaping the relationship between employees and employers, and one significant trend that has emerged is the declining importance of work relative to other aspects of life, particularly among younger generations.

The World Values Survey, as cited in the Bain report, shows that younger generations place a lower importance on work relative to leisure time compared to older generations at the same age (Schwedel *et al.*, 2022). Interestingly, in this new work scene, the leading role

is no longer played by compensation alone. While fair pay remains crucial, with 56% of respondents ranking it in their top three factors, it's clear that a purely financial view of employment underestimates the deeper human motivations for work. Factors such as interesting work (15%) and an inspiring company (5%) also play significant roles in job satisfaction.

Thus, to understand the current state of the workforce, it's crucial to take into account other aspects of the work life, such as employee engagement: a concept introduced by Kahn (1990), referring to “the harnessing of organization members’ selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances” (p. 694). Schaufeli *et al.* (2002) further defined engagement as “a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption” (p. 74).

Gallup’s data from the *State of the Global Workplace Reports* provides insight into worker well-being and engagement (see Table 2). Globally, employee engagement rose to 23% in 2022, the highest level since Gallup began measuring in 2009 (Gallup, 2023). However, in Europe, engagement levels remained lower, at 13% in both 2022 and 2023 (Gallup, 2023; 2024). These figures suggest that while global trends are positive, European workers may face unique challenges in feeling connected and engaged with their work.

Table 2: Employee Engagement (2020-2023). Elaboration on Gallup data.

Region	2020	2021	2022	2023
Global	20%	21%	23%	23%
Europe	11%	14%	13%	13%
Italy	5%	4%	5%	8%

Daily stress, anger, and sadness at work have also been significant indicators of employee well-being. Gallup reports that in 2022, 44% of employees globally experienced a lot of stress the previous day, matching the record high set in 2021 (Gallup, 2023). In Europe, stress levels were slightly lower at 39% in 2022, but still substantial (Gallup, 2023). Anger

and sadness levels in Europe were reported at 15% and 17% respectively in 2023 (Gallup, 2024), indicating ongoing emotional challenges for workers (see Table 3).

Table 3: Negative Emotions (2020-2023). Elaboration on Gallup data.

Emotion	Region	2020	2021	2022	2023
Stress	Global	43%	44%	44%	41%
	Europe	39%	39%	39%	37%
	Italy	54%	49%	46%	46%
Anger	Global	24%	21%	21%	21%
	Europe	13%	19%	14%	15%
	Italy	23%	16%	11%	11%
Sadness	Global	25%	23%	<i>N/A</i>	22%
	Europe	19%	21%	<i>N/A</i>	17%
	Italy	29%	27%	<i>N/A</i>	25%

The fluctuations in engagement levels, coupled with the persistent presence of negative emotions, provide context for the emergence of two significant workplace phenomena: the *Great Resignation* and *Quiet Quitting*. The Great Resignation, characterized by unprecedented numbers of workers voluntarily leaving their jobs, gained momentum in 2021, with the highest resignation rates among mid-career employees, particularly in the tech and healthcare industries (Cook, 2021) and toxic workplace culture as the strongest predictor of industry-adjusted attrition (Sull *et al.*, 2022). In contrast, Quiet Quitting represents a more subtle form of disengagement. Gallup’s 2023 report reveals that 59% of workers could be classified as “quiet quitters” - individuals who are psychologically disconnected from their work and do only the minimum required (Gallup, 2023). This phenomenon reflects a broader reassessment of work-life balance and job satisfaction in the wake of the pandemic.

However, to fully understand these phenomena, we need to examine the underlying behavioral and psychological factors at play. The varying levels of engagement, stress, and preferences for remote work suggest that a one-size-fits-all approach to workplace policies may be inadequate. As we go deeper into the post-pandemic work landscape, it becomes increasingly clear that individual differences hold a significant role in how employees adapt to and thrive in new work arrangements.

2. The Taming of the Crew: Understanding Workers' Needs and Wants

In the complex landscape of modern work, recognizing and accommodating individual differences among workers has become increasingly crucial. Contemporary research has thoroughly debunked the notion that a uniform approach can effectively manage all employees. Instead, understanding workers' diverse needs, motivations, and characteristics is essential for effective management and organizational success.

Central to this understanding is the concept of Person-Organization Fit (P-O fit), which refers to the compatibility between individuals and the organizations in which they work (Kristof, 1996), in terms of value congruence, goal congruence, and personality-climate congruence (Kristof-Brown *et al.*, 2005).

Value congruence, perhaps the most studied aspect of P-O fit, refers to the similarity between an individual's personal values and the organization's culture and values. When employees perceive their values align with those of their organization, they tend to experience greater job satisfaction, stronger organizational commitment, and lower turnover intentions (Verquer *et al.*, 2003).

Goal congruence relates to the alignment between an individual's personal goals and the organization's objectives. When employees feel their personal aspirations are in harmony with organizational goals, they are more likely to be motivated and engaged in their work (Vancouver & Schmitt, 1991).

Personality-climate congruence refers to the match between an individual's personality traits and the organization's work environment or climate. For instance, an extraverted individual may experience a better fit in an organization that values and rewards social interaction and teamwork (Judge & Cable, 1997).

The importance of P-O fit extends beyond these immediate outcomes: Cable and DeRue (2002) found that P-O fit perceptions were related to organizational identification, citizenship behaviors, and even employees' willingness to support the organization financially by purchasing its stock, while a meta-analysis by Kristof-Brown *et al.* (2005) demonstrated that P-O fit was significantly related to higher job satisfaction and organizational commitment, and lower intent to quit.

2.1 What workers want

Several theories complement the P-O fit concept in describing organizational behavior, such as the Ros, Schwartz, and Surkiss (1999) conceptualization of work values, the *Regulatory Focus Theory* (Higgins, 1997), and the *Self-Determination theory* (Ryan & Deci, 2000). Each of these theories contributes unique insights into the multifaceted nature of worker motivation and satisfaction, helping to paint a more complete picture of what today's employees seek from their work experiences.

2.1.1 Work values

Work values are defined as the enduring beliefs about the desirability of various work aspects and outcomes. Ros, Schwartz, and Surkiss (1999) identified four types of work values: *intrinsic*, *extrinsic*, *social*, and *prestige*.

Employees who prioritize *intrinsic* values are motivated by personal growth, autonomy, and meaningful work, and demonstrate higher job satisfaction, work engagement, and performance while being less likely to experience emotional exhaustion and turnover intentions (Vansteenkiste *et al.*, 2007).

Those who prioritize *extrinsic* values are more motivated by job security, salary, and benefits (Malka & Chatman, 2003). Employees with strong social values prioritize positive relationships at work and making meaningful contributions to society, and show improved productivity and persistence when they perceive their work as making a positive difference in others' lives (Grant, 2008).

Finally, those who value *prestige* are motivated by status, influence, and recognition, and are more likely to engage in impression management behaviors and seek leadership positions (Hu *et al.*, 2014).

It's important to note that generational differences have been observed in work values and attitudes. Twenge *et al.* (2010) analyzed data from 1976 to 2006 and found that younger generations placed higher value on leisure time and extrinsic rewards while showing less interest in intrinsic rewards compared to older generations. This shift in work values across generations is further elaborated by Kuron *et al.* (2015), who found that Millennials (Gen Y) placed higher importance on work-life balance and social work values (e.g., contributing to society) compared to previous generations. Meanwhile, Gen X prioritized freedom-related work values such as autonomy and work variety. Baby Boomers, on the other hand, typically scored higher on comfort and security work values, including job security and benefits. These findings align with Schwedel *et al.* (2022), who note a decline in the subjective importance of work across successive generations.

2.1.2 Regulatory Focus Theory

Similarly, the Regulatory Focus Theory (Higgins, 1997) posits that people can be driven by two distinct motivational orientations: *promotion focus* (oriented toward gains), and *prevention focus* (oriented toward avoiding losses).

Promotion focus is characterized by a concern with advancement, growth, and accomplishment. Individuals with a strong promotion focus tend to be motivated by ideals and aspirations, and they are more likely to take risks in pursuit of gains. In the workplace, promotion-focused employees are often driven by the desire for career advancement, skill development, and the achievement of positive outcomes, showing a positive relation to job satisfaction and innovative performance (Lanaj *et al.*, 2012).

Prevention focus, on the other hand, is characterized by a concern with safety, responsibility, and security. Individuals with a strong prevention focus are motivated by obligations and the avoidance of negative outcomes. They tend to be more cautious and vigilant in their approach to tasks and goals. In the workplace, prevention-focused employees are often driven by the need to fulfill duties, meet expectations, and avoid mistakes or failures, showing higher levels of safety performance (Lanaj *et al.*, 2012).

Wallace *et al.* (2009) found that regulatory focus interacts with leadership styles to influence employee performance. Specifically, transformational leadership was more

effective in enhancing the performance of promotion-focused individuals, while transactional leadership was more effective for prevention-focused individuals.

Moreover, Johnson *et al.* (2015) demonstrated that regulatory focus influences how employees respond to organizational change: *promotion-focused* employees tend to view change as an opportunity for growth and are more likely to support change initiatives, while *prevention-focused* employees may view change as a potential threat to stability and may be more resistant.

2.1.3 Self-Determination Theory

The third theory that offers us useful lenses to better understand “what workers want” is the Self-Determination Theory (SDT; Ryan & Deci, 2000). This macro theory of human motivation posits that individuals have three basic psychological needs: *autonomy*, *competence*, and *relatedness*. These needs are considered universal, applying across cultures and contexts, including the workplace.

Autonomy refers to the need to feel that one's actions are self-determined and volitional, rather than controlled by external forces. In the workplace, autonomy is experienced when employees feel they have choice and control over their work tasks, methods, and schedules. For example, an employee might experience autonomy when they can choose how to approach a project, set their own deadlines within broader parameters, or have flexibility in their work hours. Van den Broeck *et al.* (2016) found that autonomy was positively related to job satisfaction, work engagement, and overall well-being.

Competence refers to the need to feel effective in one's interactions with the work environment and to experience opportunities to express and expand one's capacities. This involves feeling capable of performing one's job well and having opportunities for growth and skill development. Employees might experience competence when they successfully complete challenging tasks, receive positive feedback on their work, or are given opportunities to learn new skills and take on increasing responsibilities. Baard *et al.* (2004) demonstrated that perceived competence was associated with higher performance evaluations and psychological adjustment at work.

Relatedness involves feeling connected to others, caring for and being cared for by others, and having a sense of belongingness with other individuals and one's community. In the workplace, relatedness is about feeling a sense of connection and belonging with colleagues and the organization as a whole. This might be experienced through positive interactions with coworkers, feeling part of a team working towards shared goals, or feeling that one's work contributes to the organization's mission. Reis *et al.* (2000) found that daily variations in the satisfaction of the need for relatedness predicted daily well-being.

Work environments supporting these three needs lead to enhanced intrinsic motivation, resulting in greater job satisfaction and performance (Gagné & Deci, 2005). Intrinsic motivation refers to engaging in an activity for its inherent satisfactions rather than for some separable consequence. When intrinsically motivated, people are moved to act for the fun or challenge entailed rather than because of external pressures or rewards.

SDT also distinguishes between different types of extrinsic motivation based on the degree to which they have been internalized. These range from external regulation (behavior controlled by external rewards or punishments) to integrated regulation (where external motivations have been fully assimilated to the self). This nuanced view of motivation helps explain how external factors, when internalized, can support rather than undermine autonomy.

The application of SDT in the workplace has led to significant insights. For instance, Deci *et al.* (2001) found that managers' support for autonomy was associated with higher levels of need satisfaction among employees, which in turn predicted job satisfaction, well-being, and performance. Similarly, Baard *et al.* (2004) demonstrated that both individual differences in autonomy orientation and employees' perceptions of their managers' autonomy support predicted need satisfaction and, subsequently, performance evaluations and psychological adjustment.

2.2 Six characters in search of a job

As we dive deeper into understanding worker needs and preferences, it becomes evident that individual differences (worker personalities, traits, and preferences) play a crucial role in shaping workplace experiences and outcomes. By exploring these different perspectives,

we can gain a more comprehensive understanding of the varied needs and motivations that exist within a workforce.

2.2.1 Environmental Sensitivity

Environmental sensitivity is a personality trait characterized by deeper cognitive processing of physical, social, and emotional stimuli (Aron & Aron, 1997; Greven et al., 2019). This trait is present in approximately 15-30% of the population and is thought to have evolutionary advantages in certain contexts (Pluess, 2015). Individuals high in environmental sensitivity tend to be more aware of subtleties in their environment, process information more deeply, and react more strongly to both positive and negative experiences (Lionetti *et al.*, 2018).

This heightened responsiveness can have significant implications in the workplace context. Vander Elst *et al.* (2019) found that individuals high in environmental sensitivity were more susceptible to both job stressors and resources. Specifically, highly sensitive individuals experienced stronger negative effects from job insecurity and stronger positive effects from social support compared to their less sensitive counterparts. This finding aligns with the differential susceptibility theory, which posits that some individuals are more affected by both adverse and supportive environments (Belsky & Pluess, 2009).

This heightened responsiveness to environmental factors could interact with elements of Self-Determination Theory and Regulatory Focus Theory, potentially amplifying their effects for highly sensitive individuals. For example, highly sensitive employees might experience a stronger need for autonomy (SDT) or react more intensely to promotion-focused or prevention-focused leadership styles (Regulatory Focus Theory).

By recognizing and accommodating the needs of highly sensitive individuals, organizations may be able to harness their unique strengths, such as attention to detail, empathy, and creativity, while mitigating potential challenges (Acevedo *et al.*, 2014).

2.2.2 Big Five personality traits

Similarly, the Big Five personality traits (*Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism*) have been shown to impact work behaviors and outcomes significantly (Judge & Zapata, 2015).

For instance, employees high in *Openness* tend to perform better in creative professions and are more receptive to organizational change initiatives (Vakola *et al.*, 2004). *Conscientiousness*, which encompasses traits such as organization, dependability, and goal orientation, is consistently associated with higher job performance across various occupations (Barrick & Mount, 1991), as highly conscientious individuals tend to set higher personal goals, persist in the face of challenges, and exhibit greater work engagement (Bakker *et al.*, 2012). *Extraversion*, characterized by sociability, assertiveness, and positive emotions, has been found to predict success in jobs requiring significant interpersonal interaction, such as sales and leadership roles (Barrick *et al.*, 2001; Judge *et al.*, 2002). *Agreeableness*, which includes traits like cooperativeness, empathy, and trust, has been associated with better performance in team-based work environments, contributing to a collaborative organizational climate (Ilies *et al.*, 2009). Lastly, *Neuroticism* (or its inverse, *Emotional Stability*) relates to an individual's tendency to experience negative emotions and stress. Lower levels of Neuroticism are generally associated with better job performance, particularly in high-stress occupations, as emotionally stable individuals tend to handle workplace pressures more effectively (Salgado, 1997).

It's important to note, however, that the effects of these personality traits on work outcomes can be moderated by job characteristics and organizational factors, highlighting the complex interplay between individual differences and workplace environments in shaping employee behavior and performance (Judge & Zapata, 2015).

2.2.3 Six archetypes of workers

Recognizing the limitations of the concept of an 'average worker', Schwedel *et al.* (2022) propose a new comprehensive conceptualization, to develop a more nuanced understanding of employees, moving beyond simplistic generalizations. Their vision is based on a set of specific individual traits and personal drivers and identified a 'cast' of six distinct worker archetypes, each with unique attitudes and preferences toward work:

- **Operators** find meaning primarily outside of work and view their job as a means to an end. They value stability, predictability, and teamwork, aligning with research on job

characteristics that promote satisfaction among individuals with high needs for security (Oldham & Hackman, 2010).

- **Givers** are motivated by improving others' lives and least driven by financial rewards. They often gravitate towards caring professions and value strong workplace relationships. This archetype resonates with research on prosocial motivation in the workplace, which has been linked to increased job satisfaction and performance (Grant, 2008).
- **Artisans** seek work that inspires them and are driven by the pursuit of mastery. They value autonomy and expertise over status or camaraderie. This aligns with self-determination theory's emphasis on *competence* and *autonomy* as key drivers of intrinsic motivation (Ryan & Deci, 2000).
- **Explorers** value freedom and experiences and seek variety and excitement in their careers. They are adaptable and willing to trade security for flexibility, echoing research on sensation-seeking personalities in the workplace (Zuckerman, 2014).
- **Strivers** are highly motivated by professional success, and value status and compensation. They are forward planners who may prioritize personal goals over team dynamics. This archetype aligns with research on achievement motivation and its impact on career success (Judge & Kammeyer-Mueller, 2012).
- **Pioneers** are driven by a mission to change the world, risk-tolerant and future-oriented, exhibiting characteristics similar to those identified in studies of entrepreneurial personalities (Zhao & Seibert, 2006). They strongly identify with their work and are willing to make personal sacrifices for their vision.

This framework underscores the importance of tailoring management approaches to individual worker types: for instance, while *Operators* may thrive in stable, team-oriented environments, *Explorers* might require more diverse and challenging assignments to remain engaged.

3. The Merchant of Venice... and London, and New York: Global Collaboration in the Digital Age

While individual and cultural backgrounds shape broader work-related values and behaviors, the rapid digitalization of the workplace has introduced another layer of differences that transcends national boundaries. The concept of digital natives (those who grew up with digital technology) versus digital immigrants (those who adopted digital technology later in life) highlights how generational and technological experiences intersect to create distinct groups of workers with varying levels of comfort and proficiency in digital environments (Prensky, 2001). This digital divide, however, is not solely determined by age. Individual differences in technology adoption and digital skills can be influenced by factors such as education, personal interest, and exposure to technology in various cultural contexts (Wang *et al.*, 2009).

As organizations increasingly rely on digital tools and platforms, these differences in technological adaptability become as important as cultural and personality factors in shaping workplace dynamics. Employees with higher levels of digital literacy may find it easier to adapt to new work processes and technologies, potentially leading to better job performance and satisfaction in digitally driven work environments (Colbert *et al.*, 2016).

Moreover, the interplay between cultural dimensions and technology adoption creates a complex landscape for global organizations, as employees from cultures with high uncertainty avoidance may be more resistant to adopting new technologies, while those from cultures that score high on long-term orientation might be more willing to invest time in learning new digital skills (Srite & Karahanna, 2006).

3.1 This meeting could have been an email ...or could it?

As we navigate the complexities of global digital collaboration and remote work, one theoretical framework stands out in its ability to shed light on the effectiveness of various communication media: *Media Richness Theory* (MRT). Introduced by Richard L. Daft and Robert H. Lengel in 1986, MRT has become a cornerstone in understanding how different communication channels impact information processing and decision-making in organizations.

At its core, Media Richness Theory posits that communication media vary in their capacity to convey information and facilitate understanding. This capacity, referred to as “richness,” is determined by several key factors:

- **Multiplicity of cues:** This refers to the number of ways in which information can be communicated. Rich media can transmit multiple cues simultaneously, such as verbal tone, facial expressions, body language, and written text. Lean media, on the other hand, are limited in the cues they can convey.
- **Immediacy of feedback:** Rich media allow for instant feedback and clarification, enabling real-time adjustments in communication. Lean media typically have longer feedback cycles.
- **Language variety:** This pertains to the range of meanings that can be conveyed through language symbols. Rich media support a wide variety of language symbols, including numerical, natural language, and visual representations. Lean media are more restricted in this aspect.
- **Personal focus:** Rich media have a greater capacity to convey personal feelings and emotions, allowing for a more nuanced and personalized communication experience.

Based on these criteria, Daft and Lengel (1988) arranged various communication media along a continuum from lean to rich. At one end of this continuum, we find the leanest forms of communication: *unaddressed documents* such as flyers or bulletins, which offer limited context and personalization. Moving along the spectrum, we encounter *written addressed documents* like letters and memos, which provide more targeted information but still lack immediate feedback. As we progress, *telephone conversations* emerge as a richer medium, offering vocal cues and real-time interaction, and *video conferencing* takes us a step further, introducing visual elements that enhance the communication experience. Finally, at the richest end of the spectrum, we find *face-to-face communication*, which Daft and Lengel consider the gold standard for its ability to convey multiple cues simultaneously, provide immediate feedback, and facilitate the most nuanced and complex interactions.



Figure 1. Communication media classification by Daft and Lengel (1988)

According to MRT, the choice of communication medium should align with the level of message ambiguity or equivocality (Daft & Lengel, 1986).

For routine, straightforward tasks with low ambiguity, lean media are often sufficient and can even be preferable due to their efficiency. Examples include scheduling meetings via email or calendar invites (Dennis & Valacich, 1999), sharing factual information in memos or written reports (Treviño *et al.*, 2000) or routine updates through project management software or email (Rice, 1992).

On the other hand, rich media are more suitable for complex, ambiguous, or emotionally charged communications, such as negotiations (Suh, 1999), conflict resolution (Rockmann & Northcraft, 2008) or strategic planning (Daft & Lengel, 1986), due to the immediate feedback and multiple cues provided by rich media. However, it's important to note that media choice in the workplace is not always straightforward: Markus (1994) found that managers often chose email (a relatively lean medium) for complex communications, contrary to MRT predictions, thus suggesting that other factors, such as convenience, record-keeping, and organizational norms, also play a role in media selection.

The advent of new technologies has significantly expanded the spectrum of available communication media, often blurring the lines between traditional “lean” and “rich” categories. Video conferencing tools, for instance, have evolved to become much richer than their early counterparts, and modern platforms like Zoom, Microsoft Teams, and Google Meet offer high-quality video and audio, screen sharing capabilities, and even virtual backgrounds.

These features bring video conferencing closer to face-to-face communication on the media richness spectrum and can significantly reduce the perceived communication ambiguity compared to audio-only or text-based communication (Kock, 2005). Similarly,

document and drive sharing technologies (e.g., Google Drive, Microsoft OneDrive) have enhanced the richness of asynchronous communication, allowing for real-time collaboration on documents and providing immediate feedback and multiple cues (through comments, suggestions, and edit history), which were not possible with traditional document exchange (Anders, 2016).

Virtual Reality (VR) and Augmented Reality (AR) represent the cutting edge of rich media in remote work environments, thanks to their potential to create immersive, shared virtual spaces and generate a social presence that closely mimic face-to-face interactions (Bailenson *et al.*, 2008).

3.2 The shape of tech to come

The landscape of global digital collaboration is rapidly evolving, with emerging technologies promising to revolutionize how distributed teams interact and work together. Recent research has demonstrated that VR can enhance the sense of co-presence in virtual teams, leading to improved collaboration outcomes and higher levels of trust among team members (Masood & Egger, 2019), as well as better spatial and situational awareness, resulting in more effective problem-solving and decision-making processes (Nguyen *et al.*, 2018). In the context of global teams, VR has shown promise in overcoming cultural and language barriers by providing shared virtual spaces that can be customized to accommodate diverse cultural norms and communication styles (Pinto *et al.*, 2021).

AR technologies, on the other hand, are increasingly being applied to enhance remote assistance and training scenarios. A recent meta-analysis of 38 studies revealed that AR-based training resulted in significantly better performance outcomes compared to traditional methods across various industries (Lohkamp *et al.*, 2022). This suggests that AR could play a crucial role in skill transfer and knowledge sharing within global organizations. However, the adoption of these technologies also presents challenges. A survey conducted by PwC (2022) found that while 65% of business leaders believe VR and AR will be mainstream in their organizations by 2030, concerns about data privacy, cybersecurity, and the need for significant infrastructure investments remain significant barriers to adoption.

Looking ahead, the integration of Artificial Intelligence (AI) with VR and AR technologies is expected to further enhance global collaboration capabilities. AI-powered virtual assistants could facilitate real-time language translation and cultural adaptation in virtual meetings, potentially reducing misunderstandings and improving communication efficiency in diverse teams (Wang *et al.*, 2023).

3.3 To use or not to use technology

The *Technology Acceptance Model* (TAM), introduced by Davis in 1989, has been a cornerstone in explaining individual adoption of new technologies. TAM posits that *perceived usefulness* and *perceived ease of use* are primary determinants of technology adoption. In the context of global digital collaboration, these factors can significantly influence how readily employees across different cultures embrace new collaboration platforms. However, as digital collaboration tools have become more complex and culturally diverse workforces more common, researchers have extended TAM to account for additional factors.

The *Unified Theory of Acceptance and Use of Technology* (UTAUT), proposed by Venkatesh *et al.* (2003), incorporates social influence and facilitating conditions alongside performance expectancy and effort expectancy. This model is particularly relevant for understanding technology adoption in cross-cultural settings, as it accounts for the influence of cultural norms and organizational support.

Furthermore, the Task-Technology Fit (TTF) model (Goodhue & Thompson, 1995) emphasizes the importance of aligning collaboration tools with the specific tasks and needs of global teams, suggesting that the effectiveness of digital collaboration depends not only on user acceptance but also on how well the technology supports the team's objectives and workflows.

3.4 Trust building in the virtual team

Trust is a critical component of effective team collaboration, but building and maintaining trust in virtual teams presents unique challenges. The concept of swift trust, originally proposed by Meyerson *et al.* (1996), has evolved in the context of modern digital collaboration. Recent research has shown that swift trust in virtual teams is influenced by

factors such as early communication behaviors, shared team identity, and perceived expertise (Crisp & Jarvenpaa, 2013). Their study highlights the importance of early team interactions in establishing trust norms.

Building on this, Ford *et al.* (2017) identified specific trust-building mechanisms in virtual teams, namely *frequent communication*, *transparency*, and *reliability* in task completion, and noted that these mechanisms are interconnected and mutually reinforcing. For instance, frequent communication can enhance transparency, while reliability in task completion can be more effectively demonstrated through transparent work processes.

However, maintaining trust in virtual teams presents unique challenges. A meta-analysis of 52 studies revealed that while virtual teams can develop trust, it tends to be more fragile compared to face-to-face teams (Breuer *et al.*, 2016). The study also found that task interdependence and virtuality level moderate the relationship between trust and team effectiveness, highlighting the need for tailored trust-building strategies in different virtual contexts.

To address these challenges and foster more robust trust in virtual teams, researchers have identified several effective strategies. Regular video conferencing, for instance, has been found to enhance social presence and facilitate trust development by providing visual cues that are absent in other forms of digital communication (Bos *et al.*, 2022). This approach helps to mitigate the “fragility” of trust in virtual settings by creating a sense of connection that more closely resembles face-to-face interactions. Furthermore, implementing structured team-building activities and promoting open communication can help overcome cultural barriers and foster a shared team identity, which is particularly crucial in highly virtual and interdependent team contexts (Schulze & Krumm, 2017).

The role of trust extends beyond team dynamics to the broader organizational context. Organizational trust, defined as an employee’s willingness to be vulnerable to the actions of their organization based on positive expectations (Mayer *et al.*, 1995), has been shown to significantly impact employee engagement, job satisfaction, and willingness to adapt to change (Dirks & Ferrin, 2002). In their meta-analysis, Dirks and Ferrin (2002) found that trust in organizational leadership was positively associated with job performance,

organizational citizenship behaviors, and organizational commitment, while negatively related to turnover intentions.

In the context of remote work, trust becomes even more critical. Employees working remotely must trust that their organization will support them, provide necessary resources, and fairly evaluate their performance despite the physical distance.

The leader-member exchange (LMX) theory provides a useful framework for understanding how the quality of supervisor-employee relationships impacts work outcomes (Graen & Uhl-Bien, 1995). LMX theory posits that leaders develop different quality relationships with their subordinates, ranging from low-quality (based on formal job descriptions) to high-quality (characterized by mutual trust, respect, and obligation). In remote work settings, high-quality LMX relationships become even more valuable. Golden and Veiga (2008) found that LMX quality moderated the relationship between extent of telecommuting and job satisfaction, with high-quality LMX relationships buffering the potential negative effects of extensive telecommuting.

Moreover, trust in leadership has been linked to employees' openness to organizational change (Oreg & Sverdlik, 2011), which is particularly relevant in the context of the rapid shift to remote work during the COVID-19 pandemic, where employees had to quickly adapt to new work arrangements and technologies.

Recent research has also highlighted the reciprocal nature of trust in remote work settings (Breuer *et al.*, 2020), finding that leaders' trust in their team members was positively associated with team performance in virtual teams, mediated by leader's monitoring behaviors, thus suggesting that building a culture of mutual trust is essential for effective remote work arrangements.

Chapter 1: Work in the time of COVID-19

Executive Summary:

This study investigates the working attitudes shaped by the forced shift to remote work in Italy during the two major waves of COVID-19 lockdowns in 2020 and 2021. Drawing on data from 1861 workers across 30 Italian companies, we explored how demographic and organizational factors influence remote work attitudes during a crisis, and examined the relationship between these attitudes and perceived stress levels.

Key Findings:

1. Contrary to initial hypotheses, female gender was not consistently associated with worse attitudes toward remote working. In fact, women showed a more positive perception of the effects of remote work than men.
2. Age effects were partially supported, with older employees reporting less positive effects of remote work, though overall opinions did not significantly differ across age groups.
3. Trust in immediate managers emerged as a significant predictor of positive remote work effects, particularly in the second wave of the study.
4. Both positive opinions about remote work and perceived positive effects of remote work were associated with lower stress levels. This relationship persisted across both waves of data collection, although it slightly weakened over time.
5. The number of children and the share of work activities carried out remotely were positively associated with Remote Working Opinion.

Implications:

These findings have significant implications for organizational policies and management practices in the post-pandemic era. They suggest the need for tailored approaches to remote work arrangements, considering factors such as age, family responsibilities, and trust in leadership. The results also highlight the importance of fostering positive attitudes toward remote work as a potential buffer against work-related stress.

Introduction

As discussed in the general introduction of this thesis, the COVID-19 pandemic has dramatically reshaped the global workplace, transforming traditional office-centric work cultures into distributed, digitally connected networks of remote workers.

This chapter presents the results of the study by Onesti, Bellante and Palumbo (2024), which investigates the working attitudes shaped by the forced shift to remote work in Italy during the two major waves of COVID-19 lockdowns in 2020 and 2021. Drawing on data from 1861 workers across 30 Italian companies, the study explores how demographic and organizational factors influence remote work attitudes during a crisis, and examines the relationship between these attitudes and perceived stress levels.

Italy represents a particularly significant case study for this phenomenon, as it was the first European country to mandate remote working at the pandemic's outbreak in March 2020 (Eurofound, 2020). Prior to the pandemic, only a small percentage of Italian workers had access to remote work options, with only 7% having engaged in such practices (Eurofound & ILO, 2017). This situation underwent a significant transformation, with figures reaching 53.4% in July 2020, subsequently settling at 44.7% in February 2021 (Eurofound, 2022b). This abrupt shift posed significant challenges for both employees and organizations, necessitating rapid adaptations in work practices, management approaches, and organizational cultures.

The concept of remote work, while not new, has gained unprecedented relevance in the wake of the COVID-19 pandemic. Defined by Atkinson (2022) as an approach to workplace planning allowing employees to work from a location other than the corporate office, remote work has been a subject of academic and policy interest since the 1980s (DeSanctis, 1984). However, it remained largely confined to theoretical debates until the pandemic forced its widespread adoption (Pyöriä, 2011; Martin & MacDonnell, 2012). This study aims to address two primary research questions:

1. How do demographic and organizational factors influence remote work attitudes during a crisis?
2. What is the relationship between remote work attitudes and perceived stress?

The findings of this study have significant implications for both theory and practice. From a theoretical perspective, this research contributes to the growing body of literature on remote work, specifically in the context of crisis-induced adoption. It provides empirical evidence on the factors that shape employee attitudes towards remote work and their subsequent impact on stress levels. From a practical standpoint, the insights gained from this study can guide organizations in developing more effective remote work policies, enhancing management practices, and supporting employee well-being in distributed work environments.

The remainder of this chapter is structured as follows: first, we provide a comprehensive review of the literature on remote work, focusing on its evolution, determinants of employee attitudes, and its relationship with stress. Next, we detail our methodology, including data collection procedures and analytical approach. We then present our findings, followed by a discussion of their implications. Finally, we conclude with a summary of key insights and directions for future research.

1. Theoretical Background

1.1 Remote Work and Management Control Systems

The COVID-19 pandemic has rekindled interest in remote work and its implications, both on management and performance (Adams-Prassl *et al.*, 2022; Chatterjee *et al.*, 2022) and on employee well-being, engagement, and satisfaction (Risi & Pronzato, 2021). This surge in research is evident in the bibliometric analysis conducted with Biblioshiny (Aria & Cuccurullo, 2017): out of 7150 documents on remote working published from the early 1980s to 2023, an outstanding figure of 4802 were published just between 2020 and 2023.

Documents by year

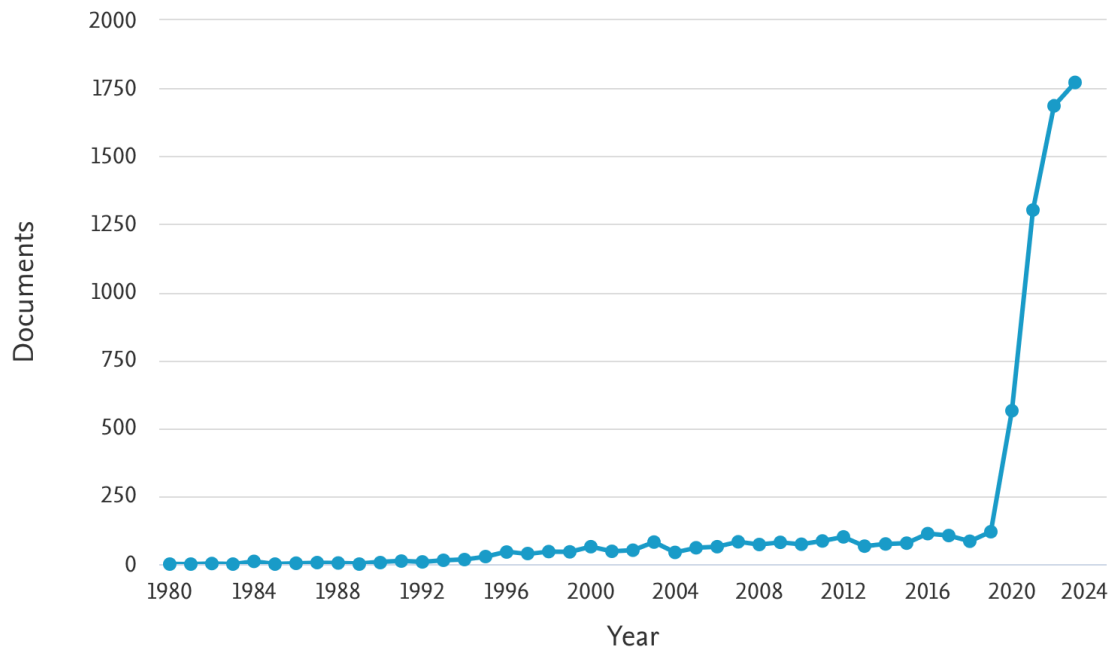


Figure 2. Number of documents indexed on Scopus by year on the subject of Remote Working (1980-2023)

The widespread adoption of remote work during the COVID-19 pandemic has significantly impacted management control practices within organizations (Delfino & van del Kolk, 2021; Mancini *et al.*, 2021). Recent literature has provided initial analyses on how management control systems are adapting to the challenges and opportunities presented by remote working environments, converging on several key themes that highlight the evolving nature of control mechanisms in the context of distributed workforces.

A primary shift observed is the transition from process-oriented to outcome-oriented controls in response to the dispersion of workforces (Galeotti *et al.*, 2023). This change reflects the reduced ability of managers to directly observe and monitor work processes in remote settings, leading organizations to rely increasingly on performance outcomes and results-based metrics to evaluate employee productivity and effectiveness. This approach aligns with the principles of Results-Only Work Environment (ROWE), which prioritizes

outcomes over traditional measures of work such as time spent or physical presence (Ressler & Thompson, 2008).

Alongside this shift, maintaining organizational culture and employee engagement has become a critical focus for management control systems (Pianese *et al.*, 2023). With the physical workplace no longer serving as the primary hub for cultural transmission and social interaction, organizations must develop new strategies to reinforce corporate values, foster collaboration, and maintain a sense of belonging among remote workers. These strategies often involve the implementation of virtual team-building activities, regular video conferences, and the use of digital platforms to facilitate informal interactions and knowledge sharing.

The role of digital tools in ensuring accountability and effective governance in decentralized settings has become increasingly crucial (Delfino & van der Kolk, 2021; Flassak *et al.*, 2023). Organizations are adopting a wide range of technological solutions to monitor work progress, facilitate communication, and maintain oversight in remote work environments. However, the implementation of these technologies must be balanced with concerns about employee privacy and the potential for excessive surveillance (Bhave *et al.*, 2020).

In this new landscape, corporate knowledge has emerged as a strategic asset in managing remote work (Lombardi, 2021). With employees dispersed across various locations, the ability to effectively capture, store, and disseminate organizational knowledge becomes critical. Management control systems must evolve to facilitate knowledge sharing and collaborative learning in virtual environments, potentially through the implementation of knowledge management systems, virtual communities of practice, and digital platforms for sharing best practices and lessons learned.

The remote work environment, particularly in the context of a global pandemic, has heightened the importance of employee well-being and psychological safety. This has led to an increased focus on human-oriented control practices to motivate and reassure employees during crises (Corsi, 2021). Management control systems must now incorporate elements that address the emotional and social needs of employees, such as regular check-ins, mental

health support, and flexible work arrangements that accommodate individual circumstances.

Emerging research also points to the importance of trust-based leadership in remote work settings (Contreras *et al.*, 2020). Traditional control mechanisms based on direct supervision become less effective in distributed work environments, necessitating a shift towards trust-based management approaches. This involves empowering employees with greater autonomy, fostering open communication, and evaluating performance based on outcomes rather than observable behaviors.

Finally, the remote work context has necessitated a reevaluation of performance metrics and evaluation processes (Kaplan & Norton, 2021). Organizations are challenged to develop new key performance indicators (KPIs) that accurately reflect productivity and contribution in a remote setting. This may involve a greater emphasis on objective, quantifiable outcomes and the incorporation of peer feedback and self-assessment mechanisms.

1.2 Attitudes towards Remote Working across Socio-demographic Groups

The shift to remote work during the COVID-19 pandemic has not been a uniform experience across all segments of the workforce. Research has shown that attitudes towards and experiences of remote work vary significantly based on several socio-demographic and organizational factors, such as gender, parental status, age, responsibility roles, and workplace trust.

1.2.1 Gender and parental status

The impact of remote work during the COVID-19 pandemic has been disproportionately felt across different demographic groups, with gender and parental status emerging as significant factors. Several studies highlight that women, especially working mothers, bore the brunt of the burden when governments implemented restrictive measures in Spring 2020.

Eurofound's e-surveys conducted in 2020 provided comprehensive insights into this phenomenon across European countries. The findings revealed that women faced a dual challenge: not only did they have to adapt to radically different work patterns, but they also

experienced a significant increase in unpaid work, such as household chores, childcare, and elderly care. This combination of factors resulted in a pronounced struggle to balance work and personal life (Eurofound, 2020).

These findings were not isolated to Europe but were corroborated by studies across various regions worldwide. For instance, Otonkorpi-Lehtoranta (2021) examined the gendered aspects of boundary work among Finnish working parents during the COVID-19 lockdown, highlighting the intensified challenges faced by mothers. Similarly, Çoban (2022) investigated the experiences of teleworking professional, middle-class, married women with children in Turkey, revealing the complex interplay between gender roles and remote work. In Canada, Smith (2022) explored the experiences of mothers in the childcare sector, uncovering the additional pressures they faced. De Vita *et al.* (2022) analyzed the impacts of smart working on women in Italy, further confirming the global nature of these challenges.

The overlap of domestic and work responsibilities during the pandemic led to a cascade of negative outcomes for working mothers. Studies have reported worse overall psychological well-being (Kapoor *et al.*, 2021), deteriorated work-life balance (Clark *et al.*, 2021; de Gennaro *et al.*, 2022), increased emotional exhaustion (Bhumika, 2020), and lower perceived productivity and job satisfaction (Feng & Savani, 2020) among this group.

1.2.2 Age

The relationship between age and attitudes towards remote work presents a complex picture, with various studies highlighting different aspects of this interaction. A meta-analysis conducted by Martin and MacDonnell (2012) provided a comprehensive overview, revealing that age serves as a negative moderator in the relationship between remote work and organizational commitment. This suggests that older employees may find it more challenging to maintain a strong connection to their organization when working remotely, potentially due to established routines and preferences for traditional work environments.

However, when considering the technological aspects of remote work, a different pattern emerges. Studies investigating the relationship between age and technostress symptoms

(e.g., panic, anxiety, technophobia, mental fatigue, insomnia, poor concentration, irritability, and memory disturbances; see Tarafdar *et al.*, 2010; La Torre *et al.*, 2019) found intriguing age-related differences. Berg-Beckhoff *et al.* (2017) discovered that for younger people (up to 35 years of age), the association between ICT use and stress is small or non-existent. This could be attributed to their familiarity and comfort with digital technologies, often being described as “digital natives” (Prensky, 2001).

Interestingly, the middle age group (35-45 years) exhibits a stronger correlation between ICT use and stress symptoms. This finding suggests that this age group might be particularly vulnerable to the technological demands of remote work, possibly due to a combination of factors such as increased job responsibilities, family obligations, and the need to adapt to rapidly evolving technologies.

These age-related differences in remote work experiences highlight the importance of tailored approaches in organizational policies and support systems. While younger employees might require less technological support, they may need more assistance in maintaining organizational commitment. Conversely, middle-aged employees might benefit from additional technological support and stress management resources.

1.2.3 Responsibility roles

The shift to remote work during the COVID-19 pandemic presented unique challenges for those in managerial and leadership positions. Contrary to initial expectations, several studies have found that managers and team leaders often faced more significant difficulties than their subordinates during lockdowns (Kirchner *et al.*, 2021; Gong *et al.*, 2022).

The transition to remote leadership required a substantial adjustment in leadership behaviors. Bartsch *et al.* (2021) and Stoker *et al.* (2022) explored how leaders had to adapt their styles to a “virtual” mode of operation. This shift involved not only mastering new communication technologies but also developing new strategies to maintain team cohesion, motivation, and productivity in a distributed work environment.

One of the key challenges for managers was the need to adopt new tools and strategies to track and assess work performance in a remote setting. Palvalin *et al.* (2015) highlighted how traditional performance metrics and management techniques often proved inadequate

in the context of remote work, necessitating the development of new approaches. This adaptation process was often stressful for managers, who had to balance the need for oversight with trust in their team members' autonomy.

Moreover, managers faced the additional pressure of supporting their team members' well-being and productivity while often struggling with their own adjustment to remote work. The lack of face-to-face interactions made it more challenging to gauge team morale, identify potential issues, and provide timely support.

1.2.4 Trust in the workplace

The role of trust in the success of remote working arrangements has emerged as a critical factor in recent literature. Studies have consistently pointed out that remote working can have beneficial effects on employees' well-being, productivity, and job satisfaction, but these positive outcomes are particularly pronounced in contexts characterized by high levels of workplace trust and positive supervisory relationships (Sekhar & Patwardhan, 2021; Chatterjee *et al.*, 2022).

Trust in the workplace operates on multiple levels in a remote work context. At the organizational level, employees need to trust that their company has their best interests in mind when implementing remote work policies. At the team level, trust among colleagues facilitates effective collaboration and knowledge sharing in virtual environments. Perhaps most crucially, trust between employees and their immediate supervisors plays a pivotal role in shaping the remote work experience.

Pyöriä (2011) emphasized that an atmosphere of mutual trust and respect is the primary requirement for a successful remote working arrangement. This trust-based approach stands in contrast to more traditional, control-based management styles that may be less effective in remote settings. When employees feel trusted, they are more likely to be engaged, motivated, and productive, even when working outside the traditional office environment.

The importance of trust in remote work settings can be understood through the lens of organizational support theory (Eisenberger *et al.*, 1986) and leader-member exchange theory (Graen & Uhl-Bien, 1995). These theories suggest that when employees perceive

high levels of support and positive relationships with their supervisors, they are more likely to reciprocate with increased commitment and performance.

1.3 Remote Working and Perceived Stress

Even before the pandemic, research had identified several stressors specific to remote work. Konradt *et al.* (2000) highlighted issues such as time management problems, difficulties in reconciling work and family responsibilities, lack of informal communication, and computer-related technical issues. These findings have been corroborated and expanded upon by more recent studies. For instance, Oakman *et al.* (2020) conducted a systematic review of the impact of working from home on physical and mental health outcomes, finding that remote work was associated with both positive and negative outcomes, with stress levels often dependent on individual circumstances and organizational support.

The sudden and widespread shift to remote work during the COVID-19 pandemic intensified many of these stressors while introducing new ones. Wang *et al.* (2021) found that the blurring of boundaries between work and personal life became more pronounced, leading to increased work-family conflict and higher levels of stress. This was particularly acute for parents managing childcare responsibilities alongside work duties (Dockery and Bawa, 2020). Moreover, the pandemic introduced additional stressors related to health concerns, social isolation, and economic uncertainty. Kniffin *et al.* (2021) provide a comprehensive overview of the implications of COVID-19 for workers and workplaces, highlighting how the pandemic has exacerbated existing stressors and created new challenges for employee well-being.

However, it's important to note that the impact of remote work on stress levels is not uniformly negative. Several studies have identified factors that can mitigate stress and even lead to positive outcomes in remote work settings. Olsen *et al.* (2023) found that employees who maintained a satisfactory work-life balance and received sufficient support from their leaders exhibited a reduced propensity to report elevated stress levels, even amidst the challenging circumstances presented by the pandemic.

This finding aligns with earlier research by Gajendran and Harrison (2007), who conducted a meta-analysis of telecommuting outcomes and found that telecommuting was

generally associated with positive outcomes, including reduced work-family conflict and increased job satisfaction. The key factor in determining these positive outcomes appeared to be the degree of autonomy and flexibility afforded to remote workers.

Organizational support plays a crucial role in mitigating stress in remote work environments. Leite *et al.* (2022) found that perceived organizational support was negatively associated with technostress among remote workers during the COVID-19 pandemic. This underscores the importance of management practices that foster a supportive environment, even when employees are physically distant.

The role of technology in remote work-related stress is particularly noteworthy. While technology enables remote work, it can also be a source of stress. The concept of 'technostress,' first introduced by Brod (1984), has gained renewed relevance in the context of pandemic-induced remote work. Molino *et al.* (2020) found that technostress creators were significantly associated with work-family conflict and behavioral stress among remote workers during the COVID-19 pandemic.

1.4 Hypotheses development

Drawing upon the existing literature and our theoretical framework, we developed several hypotheses to guide our investigation.

Several studies have highlighted that women, especially working mothers, faced greater challenges in balancing work and family responsibilities during the pandemic (Eurofound, 2020; Çoban, 2022; Smith, 2022). The overlap of domestic and work responsibilities led to worse overall psychological well-being (Kapoor et al., 2021) and work-life balance (Clark et al., 2021; de Gennaro et al., 2022) for women. Based on these findings, we hypothesized:

H1: Female gender will be associated with worse attitudes toward remote working.

Research has shown that age serves as a negative moderator in the relationship between remote work and organizational commitment (Martin & MacDonnell, 2012). Additionally, studies on technostress have found that middle-aged workers (35-45 years) exhibit stronger correlations between ICT use and stress symptoms (Berg-Beckhoff et al., 2017). Therefore, we proposed that:

H2: Older age will be associated with worse attitudes towards remote working.

Managers and team leaders often faced unique challenges in adapting to remote leadership, including difficulties in maintaining team cohesion and adapting leadership styles to virtual environments (Kirchner et al., 2021; Gong et al., 2022), which led us to hypothesize:

H3: Responsibility roles will be associated with worse attitudes towards remote working.

Previous research has shown that remote working can have beneficial effects on employees' well-being, productivity, and job satisfaction, especially in contexts characterized by high levels of workplace trust and positive supervisory relationships (Sekhar & Patwardhan, 2021; Chatterjee et al., 2022). Thus, we hypothesized:

H4: High levels of workplace trust will be associated with better attitudes towards remote working.

Drawing on Schiffrin and Nelson (2010), we anticipated that individuals who experienced positive effects of remote work and developed positive feelings towards it would also report lower levels of perceived stress.

H5: Positive attitudes toward remote working will be associated with lower Perceived Stress (PSS).

Finally, considering the significant differences in Italian workers' conditions between 2020 and 2021, including greater awareness, better access to personal protective equipment, and the launch of a nationwide vaccination campaign (Ministry of Health), we hypothesized:

H6: The absolute effects of remote working attitudes on Perceived Stress will reduce across the two waves.

2. Methodology

2.1 Design, Participants, and Procedures

Our study employed a two-wave survey approach, collecting data from a total of 1861 (First wave, N=1267; Second Wave, N=594) emergency-induced remote workers across 30 Italian companies during the COVID-19 lockdowns of 2020 and 2021. This longitudinal design allowed us to capture the evolution of remote work attitudes and experiences over time.

Participants were recruited in collaboration with an HR consulting company specializing in Assessment, Empowerment, and Wellbeing of human resources. The research program targeted medium- and large-sized companies (with no fewer than 50 employees) that had activated or intended to activate remote, flexible working modes, and maintain them even after the emergency situation throughout the Italian territory and across industries.

To incentivize participation, each company was offered a personalized report comparing their performance to the whole sample population. A final, free-of-charge meeting for presentation and discussion of the results was also scheduled for interested companies.

Questionnaires were administered throughout April-July 2020 (first wave) and January-June 2021 (second wave), corresponding to the two main restriction waves in Italy. Participants accessed the survey through a link redirecting them to our questionnaire hosted on Qualtrics. All participants were informed of the University Ethical approval and data storage and processing procedures, adherent to Regulation (EU) 2016/679 GDPR. Following the ethical standards of the 1964 declaration of Helsinki, participants were informed of their right to refuse participation or withdraw consent at any time without reprisal.

The demographic and work-related characteristics of our sample are summarized in Table 4. As shown in the table, male respondents constituted the majority of the sample (60.83%), compared to 38.26% female respondents, with 0.91% preferring not to disclose their gender. The mean age of the sample was 43.79 years (SD = 9.9 years) and age distribution primarily spanned two generations: Generation X and Generation Y/Millennials, which together comprised 86.67% of the total sample. Specifically, 50.67%

of respondents belonged to Generation X (born 1965-1980), while 36.00% were Millennials (born 1981-1996). Baby Boomers (born 1946-1964) made up 9.19% of the sample, with Generation Z (born 1997-2012) representing only 1.24%.

Regarding family responsibilities, the majority of respondents (59.11%) reported having children. The distribution of children was as follows: 40.89% had no children, 24.23% had one child, 29.02% had two children, 5.21% had three children, and 0.64% had four or more children.

In terms of professional roles, about a quarter of the respondents (24.93%) held positions of responsibility towards other employees, while the majority (74.21%) did not have such responsibilities.

Table 4. Socio-demographic characterization of the sample

		n	%
Socio-demographic variables	Gender		
	Female	712	38.26%
	Male	1132	60.83%
	Prefers not to answer	17	0.91%
	Age range		
	Boomer (1946-1964)	171	9.19%
	Gen X (1965-1980)	943	50.67%
	Millennials (1981-1996)	670	36.00%
	Gen Z (1997-2012)	23	1.24%
	Number of children		
	0	761	40.89%
Work-related variables	1	451	24.23%
	2	540	29.02%
	3	97	5.21%
	4+	12	0.64%
	Responsibility		
	Responsible for others	464	24.93%
	Not responsible for others	1381	74.21%

The geographical distribution of our sample reflected a concentration in Northern Italy, with 55% of completed questionnaires (1027) coming from the North-East, primarily from the Emilia-Romagna region. An additional 23% (431 questionnaires) came from North-West Italy, predominantly from Lombardy and Piedmont. The remaining participants were distributed across South Italy (12%, 227 questionnaires), Central Italy (6%, 120 questionnaires), and Sicily (0.3%, 5 questionnaires).

2.2 Measures

The questionnaire was developed through a series of interdisciplinary brainstorming sessions involving Business Administration and Behavioral Economics Experts, Clinical and Experimental Psychologists. This collaborative approach ensured the capture of a broad spectrum of relevant variables, aligning with prior literature on organizational wellbeing. The final questionnaire comprised five main parts:

1. **Demographic variables:** This section collected comprehensive information on participants' backgrounds, including *Gender* (coded as 0 for female and 1 for male), *Age* (collected on a continuous scale and later grouped into generations: Boomers, Gen X, Millennials, Gen Z), *Education level*, *Mode of travel used to commute to work*, *Travel times* (Time To Work), *Responsibility role* (measured through the yes/no question "Are you responsible for other workers?"), and *Amount of work* currently done remotely (measured as a percentage).
2. **Impact of Remote Working (Remote Working Effect):** Participants were asked to assess how remote working affected various aspects of their work life. The question posed was "How has Remote Working affected the following aspects of work?" and responses were recorded on a 3-point Likert scale (*improvement, worsening, no change*) for the following areas: Productivity at work, Relationship with family members and in the private sphere, Proposed innovations, Relation with colleagues, Relation with management, Relation with collaborators, Relation with clients, and Workload. A composite measure, the "Remote Working Effect" index, was developed based on these variables: $RWeff_i = \sum_{(n=1 \text{ to } 8)} RWeff_{(n,i)} / \text{Max}$

reachable_i. The index consisted of 8 items with a Cronbach's Alpha of $\alpha = .70$, indicating acceptable internal consistency.

3. **Workers' Expectations and Attitudes (Remote Working Opinion):** This section examined employees' general opinions about the implementation of emergency remote working in their company, measuring on a 5-point Likert scale the Quality of their own workstation, Perception of colleagues' remote work, Perception of the company in general, Intention to continue working remotely after the emergency, and Intention to recommend implementing remote working. A "Remote Working Opinion" index was calculated as: $RWop_i = \sum(\text{workstation}_i + \text{envir}_i + \text{coll}_i + \text{contin}_i + \text{recommend}_i) / \text{Max reachable}_i$. The index consisted of 5 items with a Cronbach's Alpha of $\alpha = .87$, indicating good internal consistency.
4. **Perceived Stress:** This section included validated psychological measures to assess factors that might have affected the appreciation of the new remote work mode and highlight any problematic levels related to the subjective perception of stress. The primary measure used was the Perceived Stress Scale (PSS; Cohen, 2004): Participants indicated how frequently they experienced negative feelings on a 5-point Likert scale ranging from "Never" to "Very Frequently".
5. **Trust Measures:** Included in the second wave of data collection, this section assessed workplace trust using the Workplace Trust Survey Scale (WTS; Connell *et al.*, 2003). It measured three dimensions of trust on a 5-point Likert scale:
 - Trust in Organization (e.g., "There is a widely held belief that [Organization] is moving forward for the better");
 - Trust in Co-workers (e.g., "I feel I can trust my co-workers to do their jobs well");
 - Trust in Immediate Manager(s) (e.g., "I feel that my supervisor listens to what I have to say").

2.3 Analytic Plan

To address our research questions and test our hypotheses, we employed a multi-step analytical approach. All analyses have been conducted via Matlab.

2.3.1 Preliminary Analysis

Our analytical approach was designed to comprehensively examine the factors influencing remote work attitudes and their relationship with perceived stress. We began with preliminary analyses to explore the basic relationships in our data before moving on to more complex modeling techniques.

Initially, we conducted descriptive statistical analyses to understand the characteristics of our sample and the distribution of key variables. This provided us with a foundational understanding of the data and helped identify any potential outliers or anomalies that might influence our subsequent analyses.

To test our hypotheses regarding the influence of demographic and organizational factors on remote work attitudes, we first employed t-tests and one-way ANOVA analyses. These techniques allowed us to examine differences in remote work attitudes across various groups, such as gender, age categories, and responsibility roles. For instance, we used t-tests to compare Remote Working Opinion and Remote Working Effect scores between men and women, and between those with and without responsibility roles. ANOVA was utilized to investigate age-related differences, comparing Boomers, Gen X, and Millennials (excluding Gen Z due to small sample size).

Following these preliminary analyses, we developed two main regression models to address our primary research questions.

2.3.2 Model 1: Opinion prediction model towards Remote Working

We used multiple linear regression to predict Remote Working Opinion (RWop) and Remote Working Effect (RWeff) using the following equation:

$$RWop_i = \alpha_i + \beta_1 Gender_i + \beta_2 Age_i + \beta_3 TTW_i + \beta_4 Resp_i + \beta_5 Childs_i + \beta_6 RW_share_i + \beta_7 TR1_i + \beta_8 TR2_i + \beta_9 TR3_i + U_i + \varepsilon_i$$

Where Gender, Age, TTW (Time to Work), Resp (Responsibility), Childs (Number of children), and RW_share (Share of remote work) are predictor variables; TR1, TR2, and TR3 represent trust in organization, co-workers, and immediate manager(s) respectively;

U_i is the firm-specific term (dummy variable); ε_i is the residual error term. An identical equation was used for $RWeff_i$ as the dependent variable.

2.3.3 Model 2: Relation of Remote Working attitudes on Perceived Stress

We used multiple linear regression to examine the relationship between Remote Working attitudes and Perceived Stress (PSS):

$$PSS_i = \alpha_i + \beta_1 Gender_i + \beta_2 Age_i + \beta_3 RWop_i + \beta_4 RWeff_i + U_i + \varepsilon_i$$

2.3.4 Comparison between wave 1 and 2

Lastly, to examine potential differences between the two waves of data collection, we conducted a separate analysis using the following equation:

$$PSS_{w_i} = \alpha_i + W_1\beta_1 Gender_i + W_1\beta_2 Age_i + W_1\beta_3 RWop_i + W_1\beta_4 RWeff_i + W_2\beta_5 Gender_i + W_2\beta_6 Age_i + W_2\beta_7 RWop_i + W_2\beta_8 RWeff_i + \varepsilon_i$$

Where W_1 and W_2 represent dummy variables for the two waves, allowing us to identify potential heterogeneous effects between the two time periods.

3. Results

To evaluate our hypotheses, we performed preliminary T-tests and ANOVA analyses on Matlab, prior to conducting regression models. Our analyses revealed several key findings regarding the factors influencing remote work attitudes and their relationship with perceived stress. We'll present these results in a structured manner, starting with descriptive statistics, moving through our preliminary analyses, and then detailing the outcomes of our two main regression models. These models examine the factors influencing remote work attitudes and the relationship between these attitudes and perceived stress levels, respectively. Finally, we'll explore how these relationships evolved across the two waves of data collection during the COVID-19 pandemic in Italy.

3.1 Descriptive Statistics

Descriptive statistics are presented in Table 5, alongside the mean (M) and standard deviation (SD) for each variable.

The Remote Working Opinion index showed a mean of 3.89 (SD = 0.66) on a 5-point scale, indicating a favorable view of remote work. Similarly, the Remote Working Effect index had a mean of 2.13 (SD = 0.32) on a 3-point scale, suggesting that participants perceived mostly positive effects of remote work on various aspects of their work life.

The mean Perceived Stress Scale (PSS) score for our sample was 14.94 (SD = 6.60), which is slightly higher than the normative scores of 12.1 for men and 13.7 for women reported by Cohen (2004). This elevated stress level likely reflects the challenging circumstances of the pandemic period.

Table 5. Descriptive statistics and correlation matrix for main variables, (N = 1861).

	Mean (SD)	1	2	3	4	5	6
1 Remote Working Opinion	0.78 (0.13)						
2 Remote Working Effect	0.71 (0.11)	.65*					
3 Perceived Stress	14.94 (6.60)	-.33*	-.29*				
4 Trust in Organization	71.28 (17.59)	.07	.07	.01			
5 Trust in Colleagues	63.32 (19.56)	.06	.04	.00	.76*		
6 Trust in Immediate Supervisor(s)	61.64 (22.43)	-.02	.07	.02	.44*	.51*	

Note: * $p < .001$.

3.2 Preliminary Analyses

To explore the initial relationships between our key variables and demographic factors, we conducted a series of t-tests and ANOVA analyses.

First, we examined gender differences in attitudes towards remote working. Our t-tests revealed no significant differences between men and women regarding Remote Working Opinion ($t = 0.78$, $p = .44$). However, when looking at the Remote Working Effect, we found a significant difference ($t = 2.40$, $p = .016$), with women showing a more positive perception than men. This finding was contrary to our initial hypothesis (H1) that female gender would be associated with worse attitudes toward remote working.

Next, we investigated the impact of responsibility roles on remote work attitudes. Our analysis showed no significant effect of having responsibility for others on Remote Working Opinion ($t = 1.65$, $p = 0.11$). However, a significant difference was found for Remote Working Effect ($t = 3.07$, $p = 0.002$), with workers in roles of responsibility exhibiting lower scores, albeit still on the positive side of the Likert scale. This partially supports our hypothesis (H3) that responsibility roles would be associated with worse attitudes towards remote working, but only in terms of perceived effects rather than overall opinion.

To test our hypothesis regarding age effects (H2), we conducted a one-way ANOVA comparing Boomers, Gen X, and Millennials (excluding Gen Z due to the small sample size). We found no significant differences regarding opinions towards remote working ($F(2,1762) = 1.63$; $p = 0.20$). However, we observed a significant age effect on the perception of the Remote Working Effect ($F(2, 1762) = 7.704$; $p < .001$).

Post-hoc analyses revealed that Millennials reported higher satisfaction with remote working effects, while Gen X and Boomers reported on average a more “neutral” or “no change” perception. This finding supports our hypothesis of an age effect on the perception of remote working, with older age associated with less positive attitudes.

3.3 Model 1: Factors Influencing Remote Work Attitudes

To comprehensively examine the factors influencing remote work attitudes, we conducted multiple regression analyses for both Remote Working Opinion (RWop) and Remote Working Effect (RWeff). The results of these analyses are presented in Table 6.

Table 6. Opinion prediction model towards Remote Working (model 1).

Regressors	(1) RWop	(2) RWeff	(3) RWop	(4) RWeff
Gender	0.05	0.00	0.04	0.00
Age	-0.11***	-0.17***	-0.11***	-0.16***
TTW	0.08*	0.08*	0.08*	0.09*
Resp	-0.00	-0.03	-0.00	-0.03
Childs	0.09*	0.05	0.08*	0.05
RW_Share	0.29***	0.28***	0.27***	0.27***
Tr1	-	-	0.02	-0.06
Tr2	-	-	0.06	0.03
Tr3	-	-	0.02	0.13***
R2	0.15	0.16	0.16	0.18

Note: Standardized beta coefficients. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. (3) and (4) refer only to the second wave.

3.3.1 Remote Working Opinion (RWop)

Our analysis revealed several significant predictors of Remote Working Opinion. Age emerged as a significant negative predictor ($\beta = -0.114$, $p < 0.01$), indicating that older employees tended to have less favorable opinions about remote work. This finding further supports our hypothesis H2 regarding age effects.

Contrary to our hypothesis H1, gender did not emerge as a significant predictor of Remote Working Opinion ($\beta = 0.050$, $p > 0.05$). This suggests that, when controlling for other factors, men and women did not significantly differ in their overall attitudes towards remote work.

The number of children ($\beta = 0.090$, $p < 0.05$) and the share of work activities carried out remotely (RW_share, $\beta = 0.287$, $p < 0.01$) were both positively associated with Remote Working Opinion. This indicates that employees with more children and those who spent a larger proportion of their time working remotely tended to have more positive opinions about remote work.

Lastly, the time required to reach the workplace (TTW) showed a small but significant positive relationship with Remote Working Opinion ($\beta = 0.081$, $p < 0.05$), suggesting that those with longer commutes tended to view remote work more favorably.

3.3.2 Remote Working Effect (RWeff)

The analysis of Remote Working Effect yielded similar patterns, with some notable differences. Age again emerged as a significant negative predictor ($\beta = -0.168$, $p < 0.01$), with older employees reporting less positive effects of remote work.

As with Remote Working Opinion, the share of remote work (RW_share, $\beta = 0.276$, $p < 0.01$) and time to work (TTW, $\beta = 0.080$, $p < 0.05$) were positively associated with perceived Remote Working Effect.

Unlike the results for Remote Working Opinion, the number of children was not a significant predictor of Remote Working Effect ($\beta = 0.054$, $p > 0.05$). This suggests that while having more children is associated with more positive opinions about remote work, it doesn't necessarily translate to perceiving more positive effects.

Gender and responsibility roles did not significantly predict Remote Working Effect, mirroring the findings for Remote Working Opinion.

3.3.3 Trust Measures (Wave 2 only)

In the second wave of data collection, we included measures of trust. Our analysis showed that trust in immediate manager(s) (TR3) was a significant positive predictor of Remote Working Effect ($\beta = 0.126$, $p < 0.01$), supporting our hypothesis H4 that high levels of workplace trust would be associated with better attitudes towards remote working. However, trust measures did not significantly predict Remote Working Opinion.

Overall, our model explained 15.3% of the variance in Remote Working Opinion and 16.3% of the variance in Remote Working Effect ($R^2 = 0.153$ and 0.163 respectively),

indicating that while our identified factors play a significant role in shaping remote work attitudes, there are likely other influential factors not captured in our model.

3.4 Model 2: Relationship between Remote Work Attitudes and Perceived Stress

To investigate the relationship between remote work attitudes and perceived stress, we conducted a series of regression analyses, whose results are presented in Table 7.

Table 7. Relation of Remote Working attitudes on the Perceived Stress – PSS (model 2).

Regressors	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	PSS	PSS	PSS	PSS_w1	PSS_w1	PSS_w2	PSS_w2
Gender	-0.12*	-0.13*	-0.14*	-0.15*	-0.16*	-0.19*	-0.20*
Age	-0.09*	-0.11*	-0.11*	-0.15*	-0.16*	-0.11*	-0.12*
RWop	-	-0.32*	-0.22*	-0.35*	-0.25*	-0.30*	-0.21*
RWeff	-	-	-0.15*	-	-0.16*	-	-0.14*
R2	0.18	0.27	0.28	0.16	0.18	0.14	0.15
N	1793	1793	1793	1206	1206	574	574

Note: Standardized beta coefficients. * $p < 0.01$. The models report a smaller number than the total number of participants in the questionnaires, due to the lack of answers to some questions of the survey by the participants.

3.4.1 Overall model results

Our initial model, which included only gender and age as predictors of Perceived Stress (PSS), explained 17.7% of the variance in stress levels ($R^2 = 0.177$). When we added Remote Working Opinion (RWop) to the model, the explained variance increased to 26.9% ($R^2 = 0.269$). Finally, including both Remote Working Opinion and Remote Working Effect (RWeff) further improved the model, explaining 28.1% of the variance in perceived stress ($R^2 = 0.281$).

3.4.2 Specific Effects of Remote Working Opinion and Remote Working Effect

Both Remote Working Opinion and Remote Working Effect emerged as significant negative predictors of Perceived Stress. Remote Working Opinion had a stronger effect ($\beta = -0.223$, $p < 0.001$) compared to Remote Working Effect ($\beta = -0.146$, $p < 0.001$). This supports our hypothesis H5, indicating that positive attitudes toward remote working are indeed associated with lower Perceived Stress. Gender and age remained significant predictors of Perceived Stress across all models. Being male was associated with lower stress levels ($\beta = -0.139$, $p < 0.001$), and older age was also associated with lower stress ($\beta = -0.111$, $p < 0.001$).

3.4.3 Temporal Changes (Wave 1 vs. Wave 2)

To examine potential changes in these relationships over time, we analyzed the data separately for each wave. In both waves, Remote Working Opinion and Remote Working Effect remained significant negative predictors of Perceived Stress. However, we observed some differences.

In the first wave, Remote Working Opinion emerged as a strong negative predictor of Perceived Stress ($\beta = -0.249$, $p < 0.001$), indicating that more positive opinions about remote work were associated with significantly lower stress levels. Similarly, Remote Working Effect also showed a substantial negative relationship with stress ($\beta = -0.160$, $p < 0.001$), suggesting that perceiving positive effects from remote work was linked to reduced stress.

As we moved to the second wave of data collection, these relationships persisted but showed a slight attenuation. The negative association between Remote Working Opinion and Perceived Stress, while still robust, decreased in magnitude ($\beta = -0.206$, $p < 0.001$). Likewise, the relationship between Remote Working Effect and Perceived Stress also weakened somewhat ($\beta = -0.140$, $p < 0.001$). This subtle shift suggests a potential habituation effect, where the impact of remote work attitudes on stress levels may have diminished over time as employees became more accustomed to their new work arrangements.

These results support our hypothesis H6, showing that the absolute effects of remote working attitudes on Perceived Stress reduced slightly across the two waves. This suggests a potential habituation effect, where the impact of remote work attitudes on stress levels may have diminished over time as employees adapted to the new work arrangements. The influence of demographic factors also showed some changes across waves. The effect of gender on Perceived Stress appeared to strengthen in Wave 2 ($\beta = -0.195$, $p < 0.001$) compared to Wave 1 ($\beta = -0.158$, $p < 0.001$), while the effect of age remained relatively stable.

4. Discussion

Our study provides valuable insights into the dynamics of remote work attitudes and their relationship with perceived stress during the COVID-19 pandemic in Italy. The findings offer a nuanced understanding of how demographic and organizational factors influence remote work experiences and how these, in turn, affect employee well-being.

Contrary to our initial hypothesis (H1), we did not find consistent evidence that female gender was associated with worse attitudes toward remote working. In fact, our results suggest that women showed a more positive perception of the effects of remote work than men. This finding contrasts with several studies conducted during the early stages of the pandemic, which reported that women, especially working mothers, faced greater challenges in balancing work and family responsibilities (Eurofound, 2020; Çoban, 2022; Smith, 2022). Our results may indicate that, despite initial difficulties, women in our sample may have found ways to adapt to remote work arrangements that ultimately benefited them. This aligns with more recent research suggesting that flexible work arrangements can have positive outcomes for women's work-life balance and job satisfaction (Feng and Savani, 2020).

Our hypothesis regarding age effects (H2) was partially supported. While we didn't find significant age differences in overall opinions towards remote working, older employees reported less positive effects of remote work. This aligns with the findings of Martin and MacDonnell (2012), who found that age negatively moderates the relationship between remote work and organizational commitment. The age effect we observed could be related

to the technological challenges faced by older workers, as suggested by Berg-Beckhoff *et al.* (2017), who found stronger associations between ICT use and stress symptoms in middle-aged workers.

The impact of responsibility roles on remote work attitudes (H3) was also partially supported. While having responsibility for others didn't significantly affect overall opinions about remote work, it was associated with less positive perceptions of remote work effects. This finding echoes the challenges for managers in remote settings identified by Kirchner *et al.* (2021) and Gong *et al.* (2022), such as difficulties in maintaining team cohesion and adapting leadership styles to virtual environments.

Our results strongly support the importance of trust in shaping remote work experiences (H4). Particularly in the second wave of our study, trust in immediate managers emerged as a significant predictor of positive remote work effects. This aligns with recent literature emphasizing the crucial role of trust-based leadership in remote work settings (Contreras *et al.*, 2020) and the positive outcomes associated with high levels of workplace trust in remote environments (Sekhar & Patwardhan, 2021).

The relationship between remote work attitudes and perceived stress (H5) was clearly supported by our findings. Both positive opinions about remote work and perceived positive effects of remote work were associated with lower stress levels. This relationship persisted across both waves of data collection, although it slightly weakened over time, supporting our final hypothesis (H6). These findings align with the Job Demands-Resources model (Bakker and Demerouti, 2017), suggesting that positive attitudes towards remote work may serve as a resource that helps employees cope with the demands of their work environment.

The observed attenuation of the relationship between remote work attitudes and stress over time is particularly interesting. It may reflect a process of adaptation, where the initial novelty and challenges of remote work gave way to more established routines and coping strategies. This finding contributes to our understanding of how employees adjust to significant changes in work arrangements over time.

An unexpected finding was the positive relationship between the number of children and remote work opinions. This contrasts with studies highlighting the increased burden on

working parents during lockdowns (Kapoor *et al.*, 2021; Clark *et al.*, 2021). Our result might suggest that, for parents in our sample, the benefits of remote work (such as increased flexibility and time with family) outweighed the challenges, at least in terms of overall attitudes.

The positive association between commute time (TTW) and remote work attitudes aligns with logical expectations but provides empirical support for the idea that those with longer commutes may particularly value remote work options. This finding could have implications for how organizations approach remote work policies, especially in urban areas with long average commute times.

The strong positive relationship between the share of remote work (RW_share) and both remote work opinions and effects suggests a potential self-reinforcing cycle. Those who spend more time working remotely may develop more positive attitudes towards it, which in turn might lead them to choose to work remotely more often when given the option.

5. Conclusion

5.1 Implications

Our findings have significant implications for both organizational practice and policy-making. The complex interplay between demographic factors, organizational trust, and remote work attitudes underscores the need for nuanced, flexible approaches to remote work policies. Organizations should recognize that one-size-fits-all solutions are unlikely to be effective given the varied experiences and attitudes of different employee groups.

The positive relationship we found between trust in immediate managers and remote work attitudes highlights the critical role of leadership in successful remote work arrangements. Companies should invest in developing their managers' remote leadership skills, focusing on building and maintaining trust in virtual environments. This might involve training programs on virtual communication, remote team building, and outcome-based performance management.

Our results also suggest that organizations need to pay particular attention to older employees and those in managerial roles, who may find the transition to remote work more challenging. Targeted support, such as additional technology training for older workers or

resources for managing remote teams, could help these groups adapt more effectively to remote work settings.

The finding that women in our sample generally had more positive attitudes towards remote work, contrary to some earlier pandemic studies, suggests that remote work could potentially be a tool for enhancing gender equality in the workplace. However, organizations must be cautious to ensure that remote work doesn't inadvertently reinforce traditional gender roles or create a "two-tier" workforce where in-office employees (more likely to be men) have advantages over remote workers (more likely to be women).

From a policy perspective, our findings support the value of promoting flexible work arrangements beyond the pandemic context. Policymakers might consider incentives for companies to offer remote work options or invest in digital infrastructure to support widespread remote work. However, policies should also address potential downsides, such as the risk of increased work-life conflict or the digital divide between those who can and cannot work remotely.

5.2 Limitations of the study

While our study provides valuable insights into remote work attitudes and their relationship with stress during the COVID-19 pandemic in Italy, it is important to acknowledge several limitations that may affect the generalizability and interpretation of our findings.

Firstly, our sample, although large and diverse, was predominantly from Northern Italy, particularly the Emilia-Romagna region. This geographical concentration may limit the generalizability of our findings to the entire Italian workforce, as different regions may have experienced varying degrees of pandemic impact and have different work cultures. In addition to that, our focus on the Italian context, while providing valuable insights into a specific cultural and organizational environment, may limit the direct applicability of our findings to other countries with different work cultures, pandemic responses, or remote work policies.

Secondly, the cross-sectional nature of our data collection at two time points, while providing some insight into temporal changes, does not allow for true causal inferences. The relationships we observed between variables may be influenced by unmeasured factors

or reverse causality. Moreover, while our study captured data during two significant waves of the pandemic, it represents a snapshot of a rapidly evolving situation. The long-term implications of remote work attitudes and their impact on stress may require further longitudinal investigation.

Also, our study relied on self-reported measures, which can be subject to common method bias and social desirability bias. Thus, participants' responses may have been influenced by their perceptions of what is socially acceptable or desirable, particularly given the unique circumstances of the pandemic.

Lastly, while we included several important variables in our models, the explained variance suggests that there are other factors influencing remote work attitudes and stress that were not captured in our study. These might include personality traits, specific job characteristics, or organizational culture elements beyond trust.

Despite these limitations, our study provides a robust foundation for understanding the dynamics of remote work attitudes and stress during a unique period of widespread, enforced remote work.

5.3 Future Research

While our study provides valuable insights, it also opens up several avenues for future research. Longitudinal studies tracking remote work attitudes and their impacts over extended periods would be valuable to understand long-term effects and adaptation processes. Such studies could explore whether the attenuation we observed in the relationship between remote work attitudes and stress continues over time or stabilizes at a certain point.

Future research could also delve deeper into the mechanisms through which trust influences remote work experiences and a qualitative approach might be particularly useful in uncovering the specific behaviors and practices that build trust in remote settings.

Moreover, the unexpected positive relationship we found between the number of children and remote work attitudes warrants further investigation. Studies focusing specifically on working parents could explore how remote work affects work-family

balance and whether these effects differ based on factors such as child age or availability of childcare.

Cross-cultural comparisons would be valuable to understand how the relationships we observed might vary in different cultural contexts. This could include comparisons between countries with different work cultures, social norms, or levels of technological infrastructure.

Finally, as organizations increasingly adopt hybrid work models combining remote and in-office work, research examining the dynamics of these arrangements would be timely. This could include exploring how employees navigate the transitions between remote and in-office work, how hybrid models affect team dynamics and organizational culture, and what factors contribute to successful implementation of hybrid work policies.

Chapter 2: Sense and Sensitivity

Executive Summary:

This study investigates the role of environmental sensitivity in the complex interplay between job stressors, leadership styles, and subjective well-being in the workplace. Using responses from 318 employees across two medium-large-sized Italian companies, we examined how these factors interact to influence employee well-being, with a particular focus on highly sensitive individuals.

Key Findings:

1. Higher levels of job stressors and sensitivity are associated with lower subjective well-being scores.
2. Democratic and let-it-be leadership styles are positively associated with well-being for all employees, but particularly for highly sensitive individuals.
3. Leadership styles moderate the relationship between job stressors and well-being, with democratic and let-it-be styles mitigating the negative impact of stressors, especially for highly sensitive individuals.
4. There is a three-way interaction between job stressors, leadership style, and environmental sensitivity in predicting subjective well-being, supporting the differential susceptibility hypothesis.

Implications:

Our findings suggest that organizations should consider individual differences in sensitivity when designing workplace policies and practices, and that leadership training should emphasize democratic and participative styles, as these appear beneficial for all employees, and particularly those high in sensitivity. Moreover, this study contributes to the growing body of literature on environmental sensitivity in the workplace and offers practical insights for creating more inclusive and supportive work environments that cater to the diverse needs of all employees.

Introduction

Environmental sensitivity is a well-established construct in Psychology, pertaining to individual differences in susceptibility and responsiveness to environmental stimuli (Pluess, 2015; Greven *et al.*, 2019). It captures individual variability in response to negative and positive experiences, with a significant minority of individuals, around 25 to 30%, being highly sensitive to stimuli as reported across multiple studies (Lionetti *et al.*, 2018; Pluess *et al.*, 2018). Empirical evidence showed that Environmental Sensitivity is partially heritable (Assary *et al.*, 2021), has specific genetic correlates (Keers *et al.*, 2016), and from a phenotypic point of view is captured by the trait of Sensory Processing Sensitivity (SPS) (Aron & Aron, 1997; Pluess *et al.*, 2023).

Recent studies have begun to examine how highly sensitive individuals may experience significantly different outcomes in the workplace compared to those who are not as sensitive. For instance, Evers *et al.* (2008) found that highly sensitive individuals may experience more work-related stress, while Vander Elst *et al.* (2019) reported that these individuals may also experience higher levels of job resources and well-being when those resources were available compared to their less sensitive counterparts.

The present chapter describes the results of the study conducted by Onesti, Bellante, Lionetti, Fasolo, and Palumbo, (2024), which aimed to investigate the role of leadership style in the complex interplay between individual differences in sensitivity, stress at work, and general well-being. We administered a comprehensive questionnaire to a sample of 317 individuals from two medium-large-sized Italian companies, which included measures to assess individual sensitivity, perceived leadership styles, job stressors, and subjective well-being.

The remainder of this chapter is structured as follows: first, we provide a comprehensive review of the literature on environmental sensitivity, job stressors, and leadership styles, focusing on their interplay and impact on employee well-being. Next, we detail our methodology, including participant recruitment, measures used, and our analytical approach. We then present our findings, highlighting the moderating role of leadership styles on the relationship between job stressors and well-being for highly sensitive

individuals. Following this, we discuss the implications of these findings for organizational practices and leadership development. Finally, we conclude with a summary of key insights and suggest directions for future research in the field of workplace sensitivity and well-being.

1. Theoretical Background and Hypotheses Development

1.1 Environmental Sensitivity and Sensory Processing Sensitivity

Environmental Sensitivity refers to the extent to which an individual is affected by their environment, both in terms of susceptibility to negative experiences and responsiveness to positive ones (Pluess, 2015). This construct is phenotypically captured by the trait of Sensory Processing Sensitivity (SPS), which refers to the depth of processing of sensory input (Aron & Aron, 1997; Pluess *et al.*, 2023).

SPS can be relatively easily assessed at a phenotypic level with self-report questionnaires, such as the Highly Sensitive Person Scale (Aron & Aron, 1997; Pluess *et al.*, 2023). Importantly, multiple pieces of evidence showed that Environmental Sensitivity, as captured by the SPS trait, does not fully overlap with other existent and traditionally considered personality traits and temperamental variables, though correlations have been found with both Neuroticism and Openness (Lionetti *et al.*, 2019; Bröhl *et al.*, 2020; Schaefer *et al.*, 2022). Moreover, it predicts social and emotional aspects such as interpersonal sensitivity over and above the Big Five personality traits (Tabak *et al.*, 2022).

Individuals with increased sensitivity to stimuli tend to have a higher reactivity and responsivity, meaning that if the environment is negative they tend to suffer more, report more often internalizing symptoms, and have a less positive development, as shown both in adult and child samples (Liss *et al.*, 2008; Lionetti *et al.*, 2022). However, importantly, if the environment is positive they flourish and benefit from available resources to a greater extent than low-sensitive individuals, suggesting an advantage effect (Pluess & Belsky, 2013; de Villiers *et al.*, 2018).

This differential susceptibility has been demonstrated in various contexts. For example, intervention studies have shown that highly sensitive individuals are more likely to benefit from psychological support programs than low-sensitive individuals (Pluess & Boniwell,

2015; Nocentini et al., 2018). Laboratory evidence has also shown that highly sensitive individuals exceptionally benefit from contact with nature and positive family environments (Slagt *et al.*, 2018; Setti *et al.*, 2022), and show more positive emotions when confronted with positive-eliciting emotional stimuli (Lionetti *et al.*, 2018).

In the workplace context, environmental sensitivity has emerged as a promising factor in organizational research focused on workplace well-being (Evers *et al.*, 2008; Vander Elst *et al.*, 2019). These studies suggest that highly sensitive employees may experience work environments more intensely, potentially leading to both increased vulnerability to workplace stressors and enhanced benefits from positive work conditions.

1.2 Job Stressors and Well-being

The literature on work-related stress suggests that it emerges from a mismatch between the available resources and the job demands (Bakker & Demerouti, 2017), resulting in a disequilibrium between the person and the environment (Caplan, 1987). Accordingly, situations that are traditionally considered stress-inducing are not inherently stressful but rather become so when workers perceive an inadequate allocation of resources to deal with job demands that have certain contextual, task, or role characteristics.

Empirical evidence in the work stress literature consistently points to several key factors, such as work overload, work-family conflict, and role ambiguity, as the most prevalent sources of work-related stress and subsequent exhaustion (Weinert, 2015). With specific regard to remote workers, even pre-pandemic literature has shown that this working mode is associated with peculiar stressors, such as time management problems and difficulties in reconciling work and family responsibilities, lack of informal communication with colleagues, supervisors and customers, and computer-related technical issues (Konradt et al., 2000).

However, these factors are not stressful per se but are only so in those instances where workers feel they do not have the necessary resources to cope with them. Indeed, as found by Olsen et al. (2023), employees who maintained a satisfactory work-life balance and received sufficient support from their leaders (attributes that can be identified as job

resources), exhibited a reduced propensity to report elevated stress levels, even amidst the challenging circumstances presented by the pandemic.

The impact of job stressors on well-being has been well-documented in the literature. Thompson and Prottas (2006) found that job autonomy and perceived control were positively related to employee well-being, while job stress was negatively associated with well-being. This relationship between job stressors and well-being may be particularly pronounced for highly sensitive individuals. Evers et al. (2008) found that individuals high in sensory-processing sensitivity reported more work-related stress, suggesting that they may be more vulnerable to the negative effects of job stressors on well-being.

However, the relationship between job stressors, sensitivity, and well-being is not straightforward. Vander Elst *et al.* (2019) found that while highly sensitive individuals were more susceptible to the negative effects of job insecurity, they also benefited more from social support at work. This suggests that the impact of job stressors on well-being may be moderated by both individual differences in sensitivity and the presence of job resources, such as supportive leadership.

1.3 Leadership Styles: Autocratic, Democratic, and Let-it-be

Leadership styles, defined as sets of behaviors that leaders adopt to influence their subordinates (Bass & Riggio, 2006), have gained significant attention in organizational behavior research due to their considerable impact on employee outcomes. Among the several conceptualizations proposed by researchers, the present study focuses on the three primary leadership styles identified by Lewin, Lippit, and White in 1939 and revisited by Scheidlinger in 1994: autocratic (or authoritative), democratic (or participative), and let-it-be (or 'laissez-faire').

Extant literature has consistently found that leadership styles can influence a wide range of work outcomes, such as job satisfaction (Chan, 2019), work engagement (Tuckey *et al.*, 2012), and psychological well-being (Inceoglu *et al.*, 2018). Numerous studies have reported that leadership styles based on control are associated with poor job well-being and psychological health among employees (Inceoglu *et al.*, 2018; Nyberg, 2009; Kuoppala *et al.*, 2008). Specifically, autocratic and self-centered leadership styles have been connected

to adverse employee mental health, vitality, and increased behavioral stress (Nyberg, 2009), higher levels of job strain and lower levels of job satisfaction (Schyns & Schilling, 2013).

On the other hand, participative management styles have been shown to be associated with higher levels of job satisfaction, affective commitment, and employee engagement (Chan, 2019; Bhatti *et al.*, 2012). Democratic leadership, which encourages employee participation in decision-making, has been linked to improved job satisfaction and organizational commitment (Bhatti *et al.*, 2012).

The impact of let-it-be leadership is more complex: Skogstad *et al.* (2007) found that let-it-be leadership has been associated with employee psychological distress and elevated levels of burnout. However, the relationship varies depending on the organization's structure and personnel's skills. The impact of let-it-be leadership on stress was revealed to be mediated by specific workplace stressors, such as exposure to workplace bullying.

It's worth noting that the majority of literature examining the relationship between leadership and well-being has primarily focused on transformational and transactional leadership styles (Nyberg, 2009; Braun *et al.*, 2013), as defined by Bass in 1985. Moreover, these studies have often taken into account aspects of well-being that are strictly related to the work context, such as job satisfaction (Bhatti *et al.*, 2012; Braun *et al.*, 2013; Hobman *et al.*, 2009). Thus, the relationship between autocratic, democratic, and let-it-be leadership and employees' general well-being remains understudied in recent literature, as these leadership styles have mostly been explored in terms of their impact on job performance (Huang *et al.*, 2010; Ahmed Iqbal *et al.*, 2021).

1.4 Hypotheses development

Based on the literature on job stress and environmental sensitivity, we expect that job stressors will negatively impact subjective well-being, with this effect being more pronounced for highly sensitive individuals due to their heightened reactivity to environmental stimuli (Thompson & Prottas, 2006; Evers *et al.*, 2008).

H1: Job stressors will be negatively associated with subjective well-being for all employees, with this relationship being stronger for individuals high in environmental sensitivity.

Leadership styles have been shown to significantly influence employee outcomes, including well-being (Inceoglu et al., 2018). Given the differential susceptibility of highly sensitive individuals to both positive and negative environmental factors (Pluess & Belsky, 2013), we expect that the impact of different leadership styles on well-being will vary based on an individual's level of environmental sensitivity.

H2a: Democratic leadership style will be positively associated with subjective well-being, with this relationship being stronger for individuals high in environmental sensitivity.

H2b: Let-it-be leadership style will have a complex relationship with subjective well-being, moderated by environmental sensitivity. For highly sensitive individuals, let-it-be leadership may be associated with higher well-being in low-stress environments but lower well-being in high-stress environments.

H2c: Autocratic leadership style will be negatively associated with subjective well-being, with this relationship being stronger for individuals high in environmental sensitivity.

Integrating the various strands of research discussed, we propose a complex interplay between individual differences, leadership, and workplace stressors in determining employee well-being. We expect that positive leadership styles may serve as a buffer against the negative effects of job stressors, particularly for highly sensitive individuals who are more responsive to both positive and negative environmental influences (Vander Elst et al., 2019).

H3: There will be a three-way interaction between job stressors, leadership style, and environmental sensitivity in predicting subjective well-being. Specifically, positive leadership styles (democratic and potentially let-it-be) will buffer the negative effects of job stressors on well-being, particularly for highly sensitive individuals.

2. Methodology

2.1 Design, Participants, and Procedures

Given our window of time and available contacts and resources, participants were recruited in collaboration with an HR consulting company specializing in the Assessment, Empowerment, and Well-being of Human Resources in Italy. Questionnaires were administered between May and July 2022 and involved two medium-large-sized Italian companies that also had offices abroad.

Participants were directed to our questionnaire by clicking on a provided link, which was hosted through Qualtrics. Prior to participation, participants were provided with information regarding the University's Ethical approval and data storage and processing procedures, ensuring compliance with Regulation (EU) 2016/679 GDPR. The study adhered to the ethical standards outlined in the 1964 Declaration of Helsinki, and participants were explicitly informed of their right to refuse participation or to withdraw their consent at any time without facing any negative consequences or reprisals. After being provided with all the above information, participants explicitly declared their informed consent to participation by selecting the relevant opt-in option before beginning to fill out the survey.

Our study sample consisted of 317 participants. The age distribution spanned across four generations, with Gen X (born 1965-1980) representing the largest group at 39.75% of the sample, followed closely by Millennials (born 1981-1996) at 34.70%. Boomers (born 1946-1964) made up 22.71% of the sample, while Gen Z (born 1997-2012) had the smallest representation at 2.84%.

Regarding tenure, the majority of participants (41.95%) had been with their current employer for more than 10 years, indicating a sample with substantial work experience. The second largest group was those with 1-3 years of tenure (21.45%), followed by those with 6-10 years (15.46%). Participants with less than one year of tenure made up 11.36% of the sample, while those with 4-5 years of tenure represented 9.78%.

Table 8. Socio-demographic characterization of the sample

		n	%
Socio-demographic variables	Gender		
	Female	107	33.75%
	Male	204	64.35%
	Prefers not to answer	6	1.89%
	Age range		
	Boomer (1946-1964)	72	22.71%
	Gen X (1965-1980)	126	39.75%
	Millennials (1981-1996)	110	34.70%
	Gen Z (1997-2012)	9	2.84%
Work-related variables	Tenure		
	< 1 year	36	11.36%
	1-3 years	68	21.45%
	4-5 years	31	9.78%
	6-10 years	49	15.46%
	> 10 years	133	41.95%

2.2 Measures

The questionnaire was developed through the integration of existing validated scales and comprised five sections.

1. **Demographic variables:** These included questions about gender, age, current occupational status, tenure in current workplace and role, and leadership responsibilities.
2. **Environmental Sensitivity:** Environmental sensitivity was assessed using the 12-item Highly Sensitive Person Scale (Aron & Aron, 1997; Pluess *et al.*, 2023), recently validated in an Italian population (Lionetti *et al.*, 2024). The questionnaire fits a bifactor structure, with a general sensitivity factor and three subscales, namely aesthetic sensitivity, low sensory threshold, and ease of excitation. Each item is rated on a 7-point Likert scale from “1 - Not at all” to “7 - Extremely” (e.g., “Do you seem to be aware of subtleties in your environment?”, “Do you get rattled when you have a

lot to do in a short amount of time?”). The internal consistency of the current sample has a Cronbach’s Alpha of $\alpha = .97$, higher than the value (.80) reported in the original validation paper by Pluess et al. (2023).

3. **General Well-being:** Subjective well-being was assessed through the use of the WHO-5 Well-being Index (WHO, 1998), where participants were asked to indicate on a 6-point Likert scale (from “0 - At no time” to “5 - All of the time”) how often they experienced certain feelings during the previous two weeks (e.g., “I have felt calm and relaxed,” “I woke up feeling fresh and rested”). The Cronbach’s Alpha for our sample is $\alpha = .85$, in line with the values (between .82 and .89) found by Topp *et al.* (2015).
4. **Job Stressors:** To assess job-related stressors, we employed a subset of the Job Stressor and Job Satisfaction Scale developed by Clarke *et al.* (2008), comprising six items formulated to gauge job stressors such as excessive workload, physical strain, and time constraints. We excluded the sixth item, “I have very little freedom to decide how to do my work,” from our analysis due to its potential overlap with measures captured in our questionnaire pertaining to autocratic leadership style. Participants were asked to rate on a 6-point Likert scale from “1 - Strongly disagree” to “6 - Strongly agree” how much they agreed with the proposed affirmations (e.g., “I often feel bothered or upset in my work”, “I am under constant time pressure due to a heavy workload”). The Cronbach’s Alpha for our sample is $\alpha = .72$, in line with the value of .75 found by Clarke *et al.* (2008).
5. **Leadership Style:** We assessed participants’ perception of leadership styles through a set of eighteen closed questions adapted from the Leadership Style Questionnaire by Northouse (2014). Participants were asked to indicate on a 6-point Likert scale how much they agree with certain affirmations (e.g., authoritative: “In my experience, employees are closely supervised to make sure they do their job”; democratic: “In my experience, employees play an active role when it comes to making decisions”; let-it-be: “In complex situations, the supervisors let the employees solve their own problems.”). The Cronbach’s Alpha in the current sample is $\alpha = .96$ for the Democratic Leadership sub-scale, .94 for the Let-it-be Leadership sub-scale, and .86 for the Autocratic Leadership sub-scale.

2.3 Analytic Plan

To address our research questions and test our hypotheses, we employed a multi-step analytical approach, adopting the statistical software R.

2.3.1 Preliminary analysis

We conducted descriptive statistical analyses to understand the characteristics of our sample and the distribution of key variables. We performed bivariate correlation analyses to explore the relationships between our main variables of interest: environmental sensitivity, job stressors, leadership styles, and subjective well-being. This allowed us to identify initial patterns and potential multicollinearity issues.

2.3.2 Main effect regression models

We ran multiple linear regression models to examine the main effects of environmental sensitivity, job stressors, and leadership styles on subjective well-being. These models took the form:

$$\text{Well-being} = \beta_0 + \beta_1(\text{Sensitivity}) + \beta_2(\text{Job Stressors}) + \beta_3(\text{Democratic Leadership}) + \beta_4(\text{Let-it-be Leadership}) + \beta_5(\text{Autocratic Leadership}) + \varepsilon$$

Where β_0 is the intercept, β_1 - β_5 are the regression coefficients, and ε is the error term.

2.3.3 Interaction models

We then conducted a series of two-way interaction regression models to investigate how environmental sensitivity interacts with job stressors and leadership styles separately in predicting well-being. These models took the form:

$$\text{Well-being} = \beta_0 + \beta_1(\text{Sensitivity}) + \beta_2(\text{Job Stressors}) + \beta_3(\text{Leadership Style}) + \beta_4(\text{Sensitivity} \times \text{Job Stressors}) + \beta_5(\text{Sensitivity} \times \text{Leadership Style}) + \varepsilon$$

Finally, we tested three-way interaction models to explore the simultaneous interaction between sensitivity, job stressors, and leadership styles in predicting well-being. These models took the form:

$$\text{Well-being} = \beta_0 + \beta_1(\text{Sensitivity}) + \beta_2(\text{Job Stressors}) + \beta_3(\text{Leadership Style}) + \beta_4(\text{Sensitivity} \times \text{Job Stressors}) + \beta_5(\text{Sensitivity} \times \text{Leadership Style}) + \beta_6(\text{Job Stressors} \times \text{Leadership Style}) + \beta_7(\text{Sensitivity} \times \text{Job Stressors} \times \text{Leadership Style}) + \varepsilon$$

Again, we ran separate models for each leadership style. Model selection was based on Akaike Information Criterion (AIC) values (Akaike, 1974; McElreath, 2020), with lower values indicating better model fit. We compared the AIC values of the main effect, two-way interaction, and three-way interaction models to determine which best fit our data.

3. Results

3.1 Descriptive statistics

Descriptive statistics, presented in Table 9 alongside the mean (M) and standard deviation (SD) for each variable, indicated some small, yet significant, correlations. In particular, we observed a positive correlation between job stressors and Sensory Processing Sensitivity (SPS) as well as a negative correlation between job stressors and subjective well-being. SPS also negatively correlated with well-being at a bivariate level while no associations were found between SPS and perceived team leadership. Furthermore, we identified significant positive correlations between Democratic Leadership and subjective well-being ($r = .326$), and Let-it-be leadership and subjective well-being ($r = .225$).

Table 9. Descriptive statistics, correlation matrix, and Cronbach's Alpha coefficients for main variables, (N = 317).

	Mean (SD)	1	2	3	4	5	6
1 Job stressors	3.25 (0.92)	(.72)					
2 SPS	3.15 (0.56)	.22*	(.97)				
3 Democratic Leadership	4.53 (0.78)	-.08	-.08	(.96)			

4 Let-it-be Leadership	4.33 (0.66)	.00	.07	.58*	(.94)
5 Autocratic Leadership	2.92 (0.68)	.08	.05	-.11*	-.21* (.86)
6 Subjective Well-being	4.10 (0.81)	-.27*	-.27*	.33*	.23* .03 (.85)

Note: * $p < .001$. Values on the diagonal represent Cronbach's Alpha for each scale.

3.2 Main effect regression model

To examine how job stressors, leadership style, and Sensory Processing Sensitivity influence individual well-being, we conducted a linear regression analysis using the statistical software R. Regression parameters and associated significance levels are reported in Table 10. Results showed that SPS and job stressors were both related to lower levels of general well-being, whereas democratic and let-it-be leadership styles contributed to well-being positively. A positive effect also emerged for autocratic leadership on well-being, but the parameter was very low and the SE comparatively high.

Table 10. Main effect regression model: SPS, Job stressors, and team leadership predicting well-being.

	B(SE)
SPS	-0.32(.07)***
Job stressors	-0.17(.04)***
Democratic leadership	0.23(.06)***
Let it be leadership	0.16(.08)**
Autocratic leadership	0.12(.07)**

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

3.3 Interaction models

Afterward, as we were interested in exploring how these variables interact with each other in predicting the individual's adjustment, considering different sensitivity levels, we explored first a series of two-way (SPS x leadership; SPS x Job stressors) and subsequently of three-way interaction models (SPS x Job stressors x leadership), considering the different leadership styles in different univariate regression models. The main, two-way and three-way interaction models were compared considering Akaike Information Criteria, with lower values providing higher support to a model against the other tested models. Then, we explored parameters and interaction effects for the model receiving most support.

3.3.1 *Interaction with Democratic leadership*

AIC values for the main effect model and for the two-way (SPS x leadership; SPS x Job stressors) and three-way (SPS x Job stressors x leadership) interaction models were, respectively, 696.49; 694.73; 698.08 and 693.47, hence providing support to the three-way interaction model as fitting data comparatively better than the other models. The three-way interaction parameter was significant, $B(SE) = .15(.07)$, $p = .03$ and is graphically represented in Fig. 2 for medium, above, and below one standard deviation level for the SPS and democratic leadership style variables. The figure suggests that the higher the democratic style, the higher the well-being of everyone. But, importantly, in the presence of a high team democratic style, the bolstering effect of high-sensitivity individuals on stressors and well-being was reduced. That is, for those high-sensitivity individuals under high democratic leadership, the impact of the stressors on well-being is lower compared to those high-sensitivity individuals under low democratic leadership. Such findings support our hypothesis (H2a) that a democratic leadership style may decrease the detrimental impact of job stressors on well-being, particularly for highly sensitive individuals.

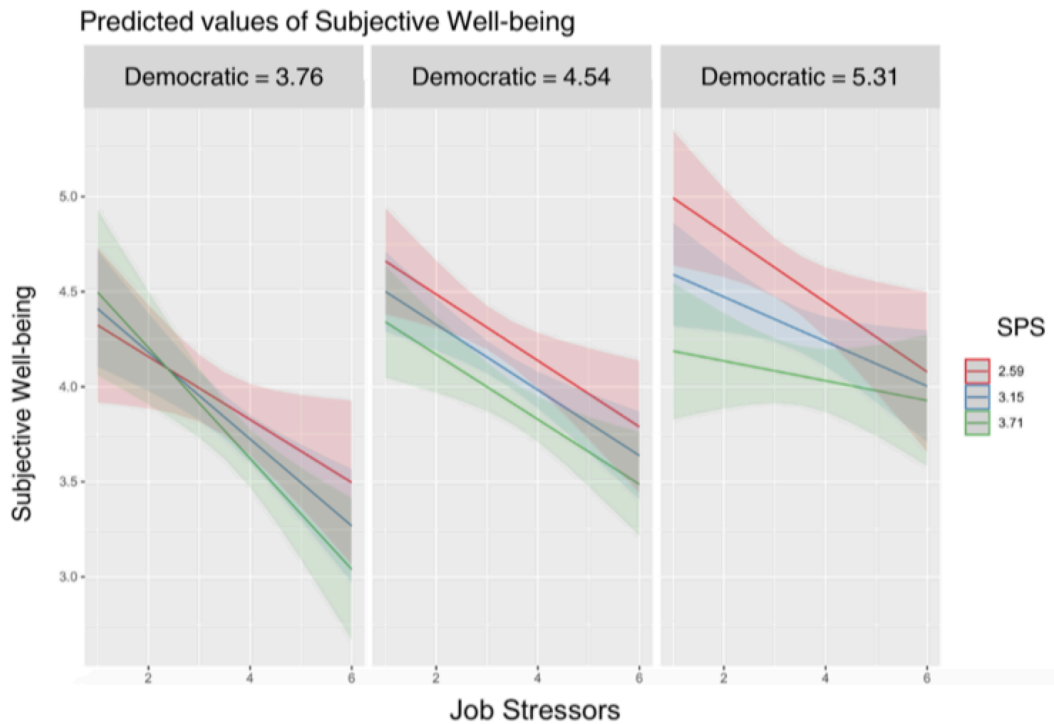


Figure 3. Three-way interaction model (Democratic Leadership).

3.3.2. Interaction with Let-it-be leadership

Findings were comparable when considering the let-it-be leadership style. Specifically, AIC values for the main model and for the two-way (SPS x leadership; SPS x Job stressors) and three-way (SPS x Job stressors x leadership) interaction model were, respectively, 707.10; 708.70; 709.01, and 696.26, hence again providing support to the three-way interaction model as fitting data comparatively better than the main effect and two-way interaction models. The three-way interaction parameter was significant, $B(SE) = .23(.08)$, $p = .004$, and is graphically represented in Figure 4. As we also found for the democratic style, the let-it-be style seems to protect highly sensitive individuals from carrying on the effects of stress at work on their general well-being. That is, for those high-sensitivity individuals under high let-it-be leadership, the impact of the stressors on well-being is lower - and almost non-existent - compared to those high-sensitivity individuals under low let-it-be leadership. Such findings partially support our hypothesis (H2b) that a leadership style characterized by a let-it-be approach protects highly sensitive individuals from the impact of stress on well-being.

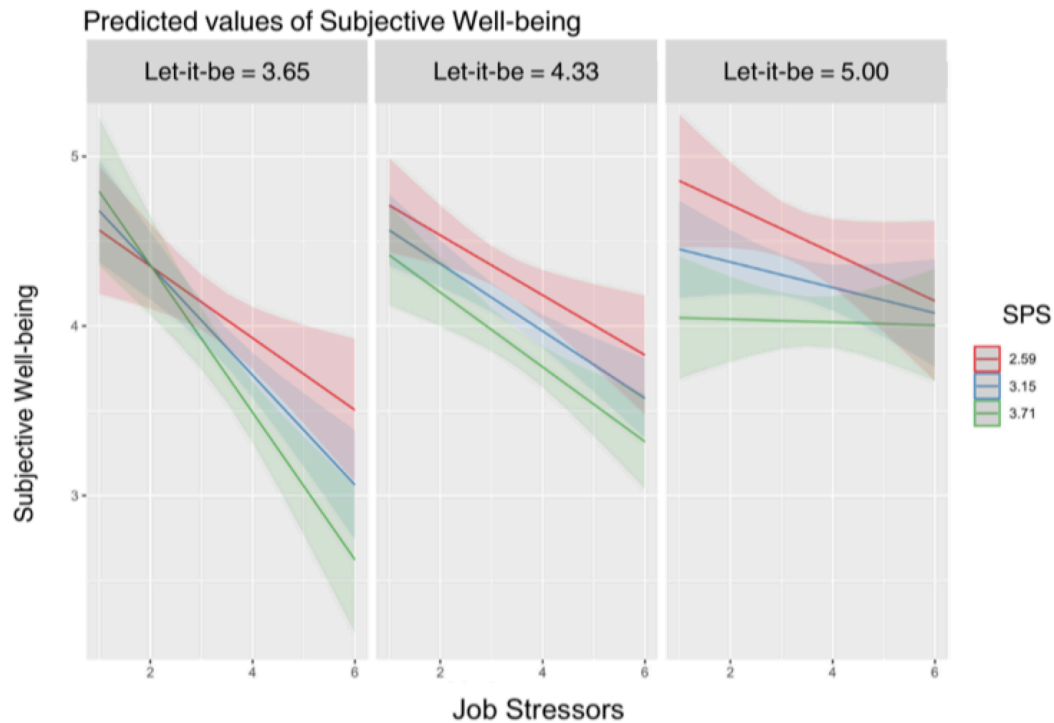


Figure 4. Three-way interaction model (*Let-it-be Leadership*)

3.3.3. Interaction with Autocratic Leadership

The three-way interaction model was the most supported also for the autocratic leadership style. AIC values for the main effect model and the two-way (SPS x leadership; SPS x Job stressors) and three-way (SPS x Job stressors x leadership) interaction models were, respectively 727.79, 727.42, 729.54, and 725.68. The three-way interaction term was again significant and equal to $B(SE) = 0.21(0.07)$, $p = .006$. However, the follow-up interpretation of the findings was not so straightforward. Specifically, individuals with low scores in autocratic leadership tend to report a weaker effect of job stressors on well-being, particularly for those who are less sensitive. However, contrary to what we hypothesized (H2c), for highly sensitive individuals, autocratic leadership does not appear to play a significant role in influencing subjective well-being.

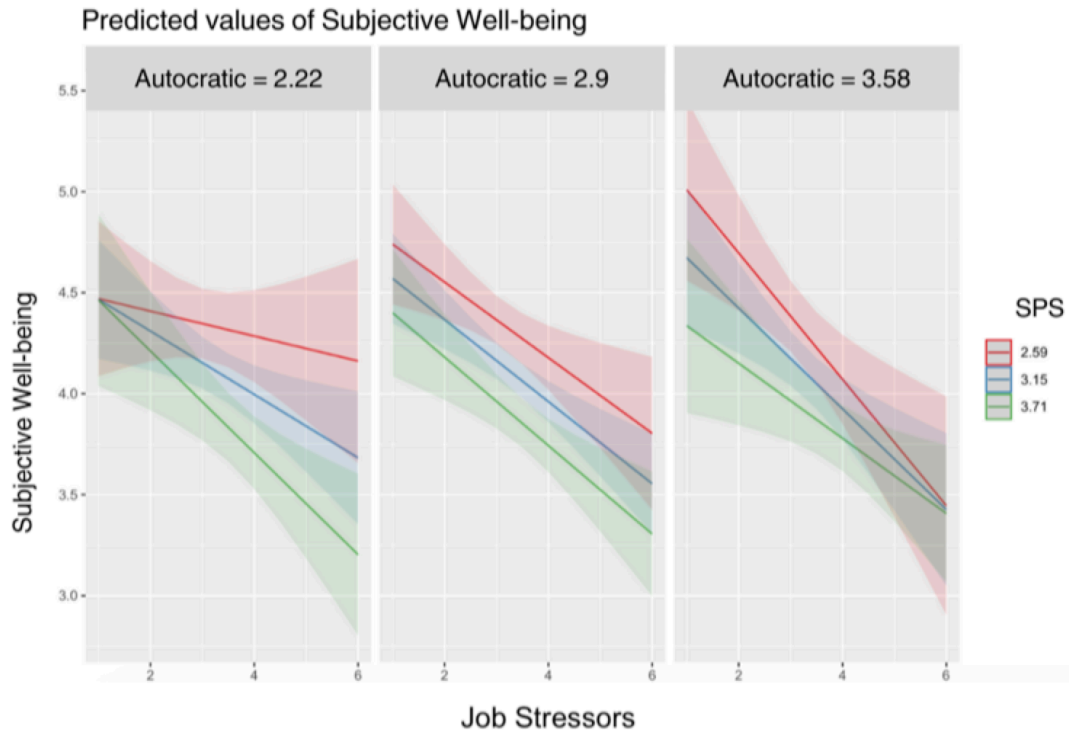


Figure 5. Three-way interaction model (Autocratic Leadership).

4. Discussion

Our study provides valuable insights into the complex interplay between job stressors, sensitivity, and team-level leadership styles in influencing subjective well-being. Our main effect regression models revealed that higher levels of job stressors and overall sensitivity were significantly associated with lower subjective well-being scores. These findings align with existing research, emphasizing the detrimental impact of job stressors on individual well-being and the relevance of sensitivity as a factor contributing to subjective well-being outcomes (Evers et al., 2008; Vander Elst et al., 2019).

Specifically, pertaining to sensitivity, our study aligns with previous findings that report a small correlation between sensitivity and both negative affect and lower well-being in adulthood (Liss et al., 2005; Lionetti et al., 2024). However, this correlation is not observed in childhood, where higher sensitivity does not seem to impact well-being unless combined with an unfavorable environment, consistent with the differential susceptibility perspective (Belsky & Pluess, 2009; Slagt et al., 2018). This finding suggests the need to explore how

environmental, cultural, or job-related factors in adulthood may pose additional challenges for highly sensitive individuals. Alternatively, the small correlation between sensitivity and neuroticism found in several studies may explain this relationship. Nonetheless, even when controlling for neuroticism, sensitivity still appears to predict lower well-being in adult samples (Lionetti et al., 2024).

What emerged to promote well-being for all was experiencing higher levels of democratic and let-it-be leadership styles, suggesting that leadership practices promoting participative decision-making and autonomy within teams may foster positive well-being outcomes among individuals. This finding is consistent with previous studies highlighting the importance of supportive and empowering leadership styles in promoting employee well-being (Spreitzer & Porath, 2012).

Findings from our two-way and three-way regression models showed that individuals with a high sensitivity, who have been reported in the empirical literature to be more at risk for stress at work (Evers *et al.*, 2008; Vander Elst *et al.*, 2019), and reported less well-being also in our sample, were more able to benefit from positive leadership styles. More specifically, for highly sensitive individuals more than for others, experiencing lower levels of positive leadership styles increased the impact of stress at work on general well-being.

On the contrary, higher levels of democratic and let-it-be leadership were found to mitigate the impact of stressors experienced at work (which are part of the everyday experience of many workers) on their well-being.

Hence, this suggests that highly sensitive individuals may be particularly attuned to relational and leadership aspects. Improving specific job-related variables could impact their well-being, with potential implications for their quality of life, organizational aspects, and productivity at work. This finding aligns with theories on environmental sensitivity, posing that highly sensitive individuals are more receptive to the quality of their environment while also suggesting some specific aspects that could be targeted for intervention programs (Pluess, 2015).

Interestingly, in our sample also the let-it-be leadership style demonstrated a strong ability to mitigate the impact of job stressors on well-being, particularly in highly sensitive ones highlighting its potential as a protective factor, especially for more sensitive

individuals. The hands-off approach of let-it-be leadership may offer employees more autonomy and control over their work, thereby reducing the negative impact of job stressors on well-being (Lazarus & Folkman, 1984; Vander Elst et al., 2019), and this seems to be particularly true for highly sensitive individuals. This may be explained by the slightly higher levels of anxiety and stress often reported by highly sensitive individuals, for whom a let-it-be style may be especially protective in work contexts.

A less expected pattern of findings emerged for the autocratic style. In this case, it was for low-sensitive individuals that lower levels of autocratic style seem to count most and be more protective for lower levels of sensitivity. Lower levels of an autocratic style still do not necessarily suggest a positive environment, and it may be that for highly sensitive individuals the absence of a negative attitude is not enough and they need higher levels of a positive one. It is to be noted, moreover, that in comparison to the other two leadership styles considered, participants reported overall lower scores on the autocratic leadership style which may also suggest that this style was not sufficiently represented in our sample.

Thus, to gain a deeper understanding of the specificity of autocratic leadership, additional investigation might be warranted in organizational contexts with a higher variability about this negative leadership style.

5. Conclusion

In this study, we aimed to investigate the combined impact of job stressors, environmental sensitivity, and leadership styles on subjective well-being. Our findings revealed significant associations between these variables and shed light on their complex interplay.

Consistent with previous research, higher levels of job stressors and overall higher levels of sensitivity were linked to lower subjective well-being scores. On the other hand, however, the presence of democratic and let-it-be leadership styles was associated with higher well-being scores and was found to mitigate the effect of job stressors on well-being, especially for highly sensitive people. This finding aligns with the concept of environmental sensitivity in the sense that for higher sensitivity levels the impact of the environment seems to increase. It further suggests that leadership may be a target variable for improving the well-being of all individuals, particularly those more at risk of stress and

consequently potentially of burnout, with ethical implications for the individual and practical implications for the work context. Lower levels of autocratic style were not sufficient to protect individuals more at risk of stress in the work contexts, as highly sensitive ones.

Overall, our findings provide valuable insights for organizations and leaders seeking to promote employee well-being and highlight how acknowledging and accommodating individual differences in sensitivity can help tailor leadership practices to the unique needs of employees, ultimately contributing to a healthier and more productive work environment. They specifically suggest an advantage effect and further seems to suggest that sensitivity is not to be interpreted only as a mere vulnerability to negative stimuli but also as a heightened receptivity to positive ones, offering theoretical and practical implications for both researchers and practitioners in the field of organizational behavior.

5.1 Implications

From a theoretical and academic perspective, our study enriches the existing literature by highlighting the significance of sensitivity as a crucial factor in influencing well-being outcomes. It further suggests that although higher levels of sensitivity may be associated with lower well-being, there are specific variables of the work context, such as leadership styles, that could be targeted for improving the well-being of all individuals, particularly of those potentially more at risk of stress. This contributes to a deeper comprehension of individual differences within the workforce and how they interact with various work-related factors, and provides a foundation for further investigations into the complexities of sensitivity and its impact on individual outcomes in the organizational context.

From a practical standpoint, our results carry essential implications for managers and human resources professionals. Recognizing the importance of environmental sensitivity in the workplace, leaders can adopt a more tailored approach to their leadership styles, considering the individual differences in sensitivity among team members. Empowering and participative leadership styles may be particularly beneficial for highly sensitive individuals, as they respond positively to both supportive and “laissez-faire” work

environments. By creating an atmosphere that acknowledges and embraces sensitivity, organizations can foster a more engaged, motivated, and satisfied workforce.

Furthermore, our study highlights the significance of addressing job stress in the workplace, particularly for highly sensitive individuals who may be more susceptible to its negative impact. Managers can proactively implement stress-reduction strategies and support mechanisms to promote the well-being of all employees, with particular attention to the needs of highly sensitive team members.

5.2 Limitations of the study

While our study has provided valuable insights, it is essential to acknowledge its limitations. One significant limitation is that all participants involved in the study reported relatively low scores of perceived autocratic leadership. This circumstance hindered our ability to adequately analyze the complex interplay of job stressors, leadership style, and sensitivity in more autocratic contexts. To gain a comprehensive understanding of how these variables interact in such settings, further investigation with a dedicated study would be warranted.

Additionally, our study relied on self-reported measures for the variables of interest (e.g., well-being, sensitivity, and job stressors). While the psychological scales we employed are validated and widely used, it is important to acknowledge the inherent limitation of relying solely on explicit answers from participants. Future research could address this issue by incorporating alternative methods to assess well-being, sensitivity, and job stressors, such as implicit measures or observational techniques.

5.3 Future research

Building on the findings and limitations of our study, several avenues for future research emerge. First, longitudinal studies tracking remote work attitudes and their impacts over extended periods would be valuable to understand long-term effects and adaptation processes. Such studies could explore whether the attenuation we observed in the relationship between remote work attitudes and stress continues over time or stabilizes at a certain point.

Future research could also further explore the mechanisms through which trust influences remote work experiences. A qualitative approach might be particularly useful in uncovering the specific behaviors and practices that build trust in remote settings.

Moreover, it would be important to explore whether and how higher levels of well-being have actual implications on other variables, such as productivity at work, creativity, and better well-being of people part of a team. Combining multiple data collection approaches and exploring the actual impact of these processes on work outcomes could provide a more robust and comprehensive understanding of the relationships between these variables.

Lastly, cross-cultural comparisons would be valuable to understand how the relationships we observed might vary in different cultural contexts. This could include comparisons between countries with different work cultures, social norms, or levels of technological infrastructure.

By addressing these areas, future research can build upon our findings to further elucidate the complex interplay between individual sensitivity, leadership styles, and workplace well-being, ultimately contributing to more effective and inclusive organizational practices.

Chapter 3: Ready Worker One

Executive Summary:

This study investigates the role of trust in the adoption of Virtual Reality (VR) technology in the workplace, examining the interplay between trust in technology, organizational trust, and motivational factors. Using responses from 1049 US workers, we examined how these factors interact to influence attitudes towards VR adoption.

Key Findings:

1. Trust in technology was found to have a significant indirect effect on VR adoption intentions, mediated by Trust Motivation.
2. Trust in top management, rather than immediate supervisors, was positively associated with Trust Motivation, which in turn strongly predicted VR adoption intentions.
3. Trust Motivation emerged as a crucial factor, having the strongest direct effect on VR adoption intentions.
4. Demographic factors such as age, gender, and prior VR experience were found to influence both Trust Motivation and VR adoption intentions.
5. The relationship between trust in technology and VR adoption was more complex than initially hypothesized, highlighting the importance of considering both individual and organizational factors in technology adoption processes.

Implications:

Our findings suggest that organizations should focus on fostering Trust Motivation to facilitate VR adoption. This could involve creating enthusiasm around VR technology through demonstrations, training sessions, or pilot programs. The importance of trust in top management underscores the need for visible support and clear communication from leadership about the potential benefits of VR initiatives.

Introduction

The landscape of work has undergone significant transformations in recent years, accelerated by the global COVID-19 pandemic and the rapid advancement of digital technologies. As explored in the previous chapters of this thesis, the shift towards remote work has presented both opportunities and challenges for organizations and employees alike. While remote work offers increased flexibility and potential for improved work-life balance (Felstead & Henseke, 2017; Galanti *et al.*, 2021), it also introduces new complexities in workplace dynamics, particularly in terms of communication, collaboration, and organizational culture (Kniffin *et al.*, 2021).

Building on our findings from Chapter 1, which examined the effects of mandatory remote working during the pandemic on stress and remote working opinions among Italian workers, and Chapter 2, which investigated the role of environmental sensitivity and leadership styles in workplace well-being, this chapter turns its focus to an emerging solution in the realm of remote work: Virtual Reality (VR) technology.

Indeed, VR technology emerges as a promising approach to address some of the challenges associated with remote work, particularly the lack of face-to-face interaction that can lead to feelings of isolation and reduced team cohesion (Galanti *et al.*, 2021). By providing a more accurate simulation of co-presence, VR has the potential to enhance social dynamics and mimic real-life interactions in virtual environments (Williamson *et al.*, 2021; Williamson *et al.*, 2022). This aligns with the findings from our previous chapters, which highlighted the importance of social connections and effective leadership in remote work settings.

However, the adoption of VR technology in the workplace is not without its challenges. As with any new technology, its acceptance and effective use depend on various factors, including technical considerations such as digital skills and access to stable internet connections (ILO, 2020), as well as psychological factors such as resistance to change (Grama & Todericiu, 2016). Moreover, as our previous chapters have shown, individual differences in sensitivity and attitudes towards remote work can significantly influence workplace experiences and outcomes.

In this context, trust emerges as a crucial factor that can significantly influence the success or failure of VR introduction in the workplace. Specifically, this chapter aims to address the following research question:

1. How does trust in technology, the organization and the immediate manager(s), and Trust Motivation affect VR adoption in the workplace?

To investigate this question, we conducted a survey of 1049 US workers, examining the effects of these psychosocial and organizational factors on the relationship between trust in technology and VR adoption. This study contributes to the growing body of literature on remote work and technology adoption, while also providing practical insights for organizations considering the implementation of VR technologies in their remote work strategies.

The findings of this study have significant implications for both theory and practice. From a theoretical perspective, this research extends our understanding of technology adoption in the context of remote work, integrating insights from trust theory, technology acceptance models, and motivational psychology. From a practical standpoint, the results can inform organizational strategies for implementing VR technologies, highlighting the importance of fostering trust at multiple levels within the organization.

The remainder of this chapter is structured as follows: first, we provide an in-depth review of the literature on technology adoption in the workplace, with a specific focus on Virtual Reality (VR) and the role of trust in this process. We then detail our methodology, including our survey design, participant recruitment, and analytical procedures. Following this, we present our findings, emphasizing the indirect effects of trust in technology and top management on VR adoption intentions. We then discuss the implications of these findings for organizations considering the implementation of VR technologies. The chapter concludes with a summary of key insights and suggestions for future research directions in the rapidly evolving field of workplace technology adoption.

1. Theoretical background and hypotheses development

1.1 From Remote Work to Virtual Presence

The transition from traditional office-based work to remote work, and now to virtual presence, represents a significant evolution in workplace practices. Traditional remote work, characterized by the use of communication tools such as emails, video conferencing, and collaboration platforms, has enabled employees to perform tasks from locations outside the traditional office environment (Vartiainen, 2021). While this arrangement offers benefits such as increased flexibility and potential improvements in work-life balance (Felstead & Henseke, 2017), it also presents challenges, particularly in terms of social interaction and team cohesion.

Recent research by Park, Ahn, and Lee (2023) highlights both the advantages and challenges associated with remote work. They emphasize efficiency gains, financial benefits, and improved employee well-being as positive outcomes. However, they also note concerns such as reduced interactions, obstacles to organizational culture formation, and privacy issues as significant challenges. Indeed, while remote work offers flexibility and autonomy (Becker *et al.*, 2022), it often lacks the sense of presence and immersion that comes with physical co-location (Yang *et al.*, 2022), as traditional remote work tools often fail to replicate the spontaneity and serendipity of in-person interactions, hindering creativity and innovation. Remote workers may, thus, feel isolated or disconnected from their colleagues, leading to challenges in communication, collaboration, and team cohesion.

The shift towards a metaverse workspace introduces opportunities for enhanced HR management, increased collaboration, and improved well-being, aiming to overcome the limitations of traditional remote work by creating immersive digital environments where remote teams can collaborate, communicate, and interact in a more lifelike manner.

Virtual Reality (VR) technology emerges as a potential solution to address these challenges by creating immersive digital environments where remote teams can collaborate, communicate, and interact in a more lifelike manner. VR technologies, such as immersive headsets, spatial audio, and haptic feedback, simulate a shared physical space, allowing remote workers to feel as if they are in the same room. This sense of presence enhances

communication and collaboration by enabling non-verbal cues, spatial awareness, and natural interactions that can be lacking in traditional remote work settings (Williamson *et al.*, 2021; 2022).

Aufegger and Elliott-Deflo (2022) discuss the impact of virtual reality on productivity in knowledge workers, highlighting the potential of VR technologies to enhance collaboration, creativity, and task performance. By providing a shared virtual space where remote teams can brainstorm, ideate, and co-create in real time, VR technologies foster a sense of co-presence and shared purpose that transcends physical distance. Virtual whiteboards, 3D modeling tools, and spatial audio enable collaborative problem-solving and innovation, facilitating the exchange of ideas and knowledge among remote team members.

Another distinguishing feature of the virtual workplace is the potential for enhanced collaboration and creativity. Abramczuk *et al.* (2023) explore the use of VR space to help remote teams connect, presenting findings from a seven-week study with horizon workrooms. By simulating a shared physical space, VR technologies bridge the gap between remote workers, fostering a sense of presence and connection that is lacking in traditional remote work settings. However, technical barriers such as hardware requirements, network latency, and software compatibility can hinder the adoption and usability of VR technologies. Moreover, privacy concerns, data security risks, and ethical considerations must be addressed to ensure the responsible use of VR in the workplace.

Furthermore, the virtual workplace offers opportunities for customization and personalization that are not available in traditional remote work settings. Remote workers can customize their virtual workspace, choosing virtual environments that suit their preferences and work styles. From serene nature settings to futuristic cityscapes, VR technologies offer a wide range of immersive environments that cater to diverse preferences (Ruvimova *et al.*, 2023).

However, the adoption of VR technology in the workplace introduces new challenges, including technical considerations such as digital skills and access to stable internet connections (ILO, 2020), as well as psychological factors such as resistance to change (Grama & Todericiu, 2016).

1.2 The role of trust in VR Adoption

The adoption of new technologies in the workplace, particularly immersive technologies like Virtual Reality (VR), may present significant challenges for organizations. Employees often exhibit resistance to change, stemming from concerns about job security, privacy, and the potential for increased surveillance (Grama & Todericiu, 2016). In the context of VR adoption, these concerns are amplified due to the technology's capacity for extensive data collection, including behavioral patterns, eye movements, and even physiological responses (Uddin *et al.*, 2023).

Recent research on metaverse workspaces has highlighted specific privacy and surveillance concerns, as some people describe the metaverse as “Big Brother” and “Panopticon,” expressing hesitation about working in an environment where all digital traces can be easily datafied (Park, Ahn, & Lee, 2023).

To overcome these challenges and facilitate the adoption of VR technology, trust emerges as a critical factor, as it serves as a foundational element in interpersonal relationships, organizational dynamics, and technological adoption (Uddin *et al.*, 2023). In this context, the Technology Acceptance Model (TAM) proposed by Davis, Bagozzi, and Warshaw (1989) provides a valuable framework for understanding the role of trust in technology adoption.

The TAM posits that perceived *usefulness* and perceived *ease of use* are key determinants of users' attitudes towards technology adoption. Trust is often conceptualized as an antecedent to these perceptions, influencing how users evaluate the potential benefits and risks of new technologies (Gefen, Karahanna, & Straub, 2003).

Recent studies have provided empirical support for the importance of trust in VR adoption, finding that trust is a positive predictor of behavioral intention to embrace the metaverse for remote work (Jin, 2004). Trust was also found to mediate the relationship between digital inequality and the propensity to adopt virtual work environments, highlighting the complex interplay between trust, digital literacy, and technology adoption.

The role of organizational trust, particularly trust in top management, is also crucial in overcoming adoption challenges. Research has shown that when employees trust their organization's leadership, they are more likely to engage positively with new technologies

introduced by the organization (Clegg *et al.*, 2002). This organizational trust can help mitigate concerns about privacy and surveillance by assuring employees that the technology will be implemented ethically and responsibly.

Despite the challenges, studies have shown that the benefits of VR in workplace settings can outweigh the concerns for many users when trust is established. Aufegger and Elliott-Deflo (2022) found that shared virtual spaces supported teams in aligning on tasks and projects, while personalized avatars contributed to team cohesiveness. Similarly, a seven-week study with Horizon Workrooms reported that participants found VR meetings to be better than video meetings, with increased conviction in VR's usefulness for various workplace activities (Abramczuk *et al.*, 2023).

1.3 Hypotheses development

Grounding in the Technology Acceptance Model (Davis *et al.*, 1989) and subsequent research on trust in technology (McKnight *et al.*, 2011), we expect that employees' perceptions of technology's functionality, reliability, and helpfulness will be a critical determinant of their attitudes and willingness to embrace VR technology in their workplace.

H1: Trust in technology will be positively associated with attitudes towards VR technology in the workplace.

On the basis of Social Exchange Theory (Blau, 1964; Cropanzano & Mitchell, 2005) and research on organizational trust (Mayer *et al.*, 1995), we anticipate that the quality of the exchange relationship between employees and their managers, as well as the overall organization, will shape employees' trust in the organization's technological initiatives.

H2a: Trust in the immediate manager will be positively associated with attitudes towards VR technology in the workplace.

H2b: Trust in top management will be positively associated with attitudes towards VR technology in the workplace.

Drawing on the concept of Trust Motivation proposed by van der Werff et al. (2019), we propose that when employees have high levels of trust in their managers and the organization, they will be more motivated to invest in and utilize the VR technology, as they will perceive it as a means to achieve their trust-related objectives.

H3a: Trust Motivation will mediate the effects of managerial trust on attitudes toward VR technology in the workplace.

H3b: Trust Motivation will mediate the effects of organizational trust on attitudes toward VR technology in the workplace.

H3c: Trust Motivation will mediate the effects of trust in technology on attitudes toward VR technology in the workplace.

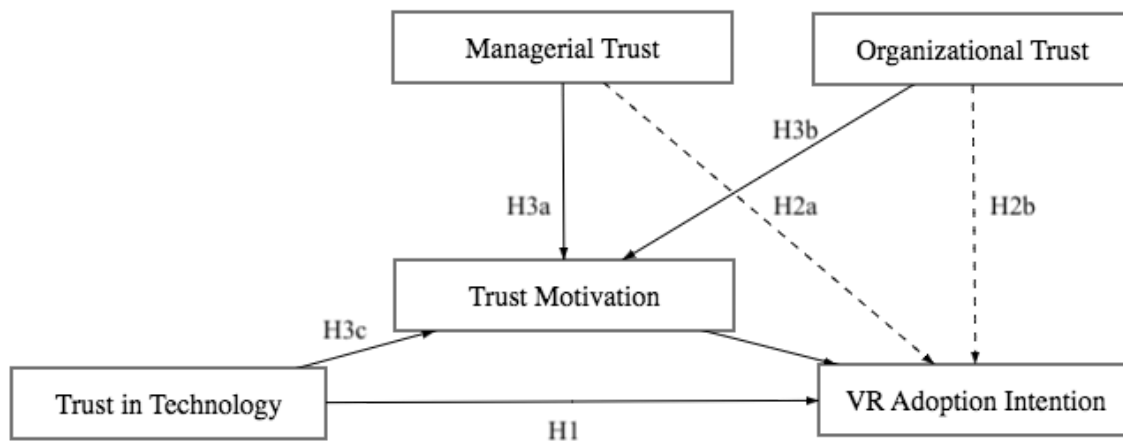


Figure 6. Graphical representation of the model

2. Methodology

2.1 Design, participants, and procedures

Our study employed a quantitative approach using an online survey hosted on Qualtrics. Participants were recruited through Qualtrics' panel services, with panel members invited to participate. Respondents came from traditional, actively managed market research panels. The study was approved by the University of Galway Research Ethics Committee, ensuring adherence to ethical research standards.

Our sample consisted of 1049 individual workers aged 18 to 60 years old, currently living in the United States, with a balanced gender distribution (47.9% female, 51.1% male, 1% non-binary or preferred not to say).

The age distribution was fairly even across categories, with a slight overrepresentation in the 55+ age range (17.3%). The majority of respondents were employed full-time (80.3%) and had been with their current employer for more than 5 years (34.2%). Regarding VR experience, 46.1% had no prior experience, while 39.3% had personal experience only. Approximately one-third of the participants (31.7%) held team leader positions.

Table 11. Socio-demographic characterization of the sample

		n	%
Socio-demographic variables	Gender		
	Female	502	47.85%
	Male	536	51.10%
	Non-binary	10	0.95%
	Prefers not to answer	1	0.10%
	Age range		
	18-24	128	12.20%
	25-29	127	12.11%
	30-34	130	12.39%
	35-39	138	13.16%
	40-44	119	11.34%
	45-49	111	10.58%
	50-54	114	10.87%
	55+	182	17.35%
Work-related variables	Employment status		
	Part-time	178	16.97%
	Full-time	842	80.27%
	Self-employed	29	2.76%

Leadership role			
Team leader	333	31.74%	
Non team leader	716	68.26%	
Tenure			
< 1 year	134	12.77%	
1 year	111	10.58%	
2 years	174	16.59%	
3 years	146	13.92%	
4 years	69	6.58%	
5 years	56	5.34%	
> 5 years	359	34.22%	
VR experience			
No experience	484	46.14%	
Personal experience	412	39.28%	
Professional experience	51	4.86%	
Both personal and professional experience	102	9.72%	

2.2 Measures

The questionnaire was developed through the integration of existing scales, with minor wording amendments to adapt some items to the context of VR technology in the workspace. The questionnaire comprised 6 sections:

1. **Demographic questions:** These included questions about gender, age, current occupational status, tenure in current workplace and role, leadership responsibilities, and previous experience with Virtual Reality Technology.
2. **Trust in technology:** We used an adapted version of the general propensity to trust in technology subscale from McKnight *et al.* (2011). This scale consists of 4 items measured on a 7-point Likert scale (e.g., “I believe that most technologies are effective at what they are designed to do”). The Cronbach’s Alpha for our sample was $\alpha = .89$.

3. **Managerial Trust:** This was assessed using an adapted version of the scale developed by Hubbell and Chory-Assad (2005), measuring on a 5-point Likert scale perceptions of managers' behavioral consistency, integrity, manner and quality of information communicated, and demonstration of concern. The Cronbach's Alpha for our sample was $\alpha = .95$.
4. **Organizational Trust:** We employed an adapted version of the scale from Mayer and Davis (1999) to measure employees' trust in their organization's top management. The scale assesses perceptions of ability, benevolence, integrity, and overall trust. Items were rated on a 5-point Likert scale. The Cronbach's Alpha for our sample was $\alpha = .95$.
5. **Trust Motivation:** We assessed Trust Motivation through an adapted measure from multiple sources including Shu, Tu, and Wang (2011), Wu, Tsui, and Kinicki (2010), and Ryan, Mimis, and Koestern (1983). The scale assesses various aspects of motivation related to VR technology use. Items were rated on a 7-point Likert scale. The Cronbach's Alpha for our sample was $\alpha = .92$.
6. **VR technology adoption:** We used items adapted from the Performance Expectancy and Behavioral Intention to Use subscales of the Unified Theory of Acceptance and Use of Technology (UTAUT) model by Venkatesh *et al.* (2003). Items were rated on a 7-point Likert scale. The Cronbach's Alpha for our sample was $\alpha = .94$.

2.3 Analytic Plan

We conducted our analyses using R Studio and the lavaan package (version 0.6-19) for structural equation modeling, following the steps presented in the next sub-paragraphs.

2.3.1 Preliminary Analysis

We began by examining descriptive statistics for all variables, including means, standard deviations, and ranges. This step allowed us to check for any anomalies in the data, such as out-of-range values or unexpected distributions. We then calculated bivariate correlations among the study variables using Pearson's correlation coefficient. This preliminary analysis

provided an initial understanding of the relationships between our variables and helped identify potential multicollinearity issues.

2.3.2 Measurement Model

To ensure the validity and reliability of our measures, we conducted a Confirmatory Factor Analysis (CFA) using the lavaan package. This step is crucial in establishing construct validity and assessing whether the observed variables adequately represent the latent constructs (Brown, 2015). We evaluated model fit using several standard indices, as recommended by Hu and Bentler (1999). We also examined factor loadings, with values above .70 considered ideal (Hair et al., 2010).

2.3.3 Structural Model

Following the establishment of a satisfactory measurement model, we employed Structural Equation Modeling (SEM) to test our hypotheses and examine the complex relationships among trust in technology, managerial trust, organizational trust, Trust Motivation, and attitudes toward VR technology adoption. We used the same fit indices as in the CFA to evaluate the structural model. Additionally, we examined path coefficients and their statistical significance to test our hypotheses. We also calculated R^2 values for endogenous variables to assess the explanatory power of the model.

2.3.4 Additional Analyses

To provide a more comprehensive understanding of VR adoption attitudes, we conducted additional analyses to explore potential differences based on demographic factors and prior VR experience. These analyses included:

- Independent samples t-tests to compare VR adoption attitudes between genders and between those with and without team leader status.
- One-way ANOVAs to examine differences in VR adoption attitudes across age groups, tenure categories, and levels of prior VR experience.
- Post-hoc tests (e.g., Tukey's HSD) for significant ANOVA results to identify specific group differences.

3. Results

3.1 Descriptive Statistics

Descriptive statistics, presented in Table 12 alongside the mean (M) and standard deviation (SD) for each variable, indicated small, yet significant, correlations. Trust in Technology showed the highest mean score (M = 5.402, SD = 1.055), while Trust Motivation had the lowest (M = 4.267, SD = 1.233).

Table 12. Descriptive statistics, correlation matrix, and Cronbach's Alpha coefficients for main variables (N = 1049).

Variable	Mean (SD)	1	2	3	4	5
1. Trust in Technology	5.40 (1.06)	(.89)				
2. Trust in Immediate Manager	4.56 (1.05)	.31*	(.95)			
3. Trust in Top Management	4.56 (1.23)	.27*	.67*	(.95)		
4. VR Adoption	4.35 (1.73)	.29*	.11*	.17*	(.94)	
5. Trust Motivation	4.27 (1.23)	.34*	.14*	.20*	.76*	(.92)

Note: * $p < .001$. Values in parentheses on the diagonal represent Cronbach's Alpha coefficients.

All correlations were statistically significant ($p < .001$). Trust in Technology showed moderate positive correlations with VR Adoption ($r = .288$) and Trust Motivation ($r = .335$). Trust in Immediate Manager and Trust in Top Management were strongly correlated with each other ($r = .668$), but showed weaker correlations with VR Adoption ($r = .109$ and $r = .165$, respectively). Notably, Trust Motivation demonstrated the strongest correlation with VR Adoption ($r = .759$), suggesting a strong relationship between these constructs. The Cronbach's alpha coefficients, ranging from .889 to .950, indicate excellent internal consistency reliability for all scales.

3.2 Measurement Model

We initially conducted a Confirmatory Factor Analysis (CFA) to assess the measurement model. The results were as follows: $\chi^2(1758) = 11609.101$, $p < .001$; CFI = 0.822; TLI = 0.815; RMSEA = 0.073 (90% CI [0.072, 0.074]); SRMR = 0.057. While the SRMR value was below the recommended cutoff of .08, indicating good fit (Hu & Bentler, 1999), other fit indices suggested room for improvement.

Table 13. Standardized Factor Loadings from CFA

Construct	Item		Std.rw g	Mean	SD
Immediate manager consistency (7-point agreement scale adapted from Hubbell, A. P., & Chory-Assad, 2005)	<i>ImmCons1</i>	<i>I believe that my superior is predictable</i>	.427	4.96	1.34
	<i>ImmCons2</i>	I believe that my superior is consistent in his/her behaviors	.819	5.40	1.35
	ImmCons3	I believe that my superior acts as I expect him/her to	.836	5.36	1.35
Immediate manager integrity (7-point agreement scale adapted from Hubbell, A. P., & Chory-Assad, 2005)	<i>ImmInt1</i>	I believe that my superior is honest with me	.881	5.33	1.47
	<i>ImmInt2</i>	I believe that my superior is not straightforward	.518	4.78	1.82
	<i>ImmInt3</i>	I believe that my superior generally tells the truth	.870	5.40	1.34
	ImmInt4	I believe that my superior keeps his/her promises	.897	5.17	1.47
	ImmInt5	I believe that my superior is someone I can rely on to keep his/her promises	.897	5.17	1.53
Immediate manager	<i>ImmInfo1</i>	I believe that my superior is a person that I can tell anything	.725	4.25	1.78

information (7-point agreement scale adapted from Hubbell, A. P., & Chory-Assad, 2005)	<i>ImmInfo2</i>	<i>I believe that my superior is not someone I can freely discuss job-related ideas and feelings with</i>	.179	4.20	1.90
	<i>ImmInfo3</i>	I believe that my superior listens to me when I tell him/her about things that are bothering me	.787	5.04	1.54
	ImmInfo4	I believe that my superior is someone whom I usually understand why he/she does the things (s)he does	.833	5.07	1.42
	<i>ImmInfo5</i>	I believe that my superior usually clearly communicates what (s)he wants	.808	5.30	1.46
	<i>ImmInfo6</i>	I believe that my superior is someone who I usually know what (s)he wants	.792	5.32	1.29
Immediate manager concern (7-point agreement scale adapted from Hubbell, A. P., & Chory-Assad, 2005)	<i>ImmConc1</i>	<i>I believe that my superior claims my ideas as his/her own</i>	.387	5.28	1.66
	<i>ImmConc2</i>	I believe that my superior would “stab” me in the back”	.696	5.35	1.72
	<i>ImmConc3</i>	I believe that my superior would communicate harmful information about me if he/she would benefit from it	.619	5.28	1.75
	<i>ImmConc4</i>	I believe that my superior is genuinely interested in my welfare	.789	4.96	1.60
	<i>ImmConc5</i>	I believe that my superior tries to help when he/she can	.859	5.37	1.44
	ImmConc6	I believe that my superior works to further my interests	.902	4.92	1.56
	<i>ImmConc7</i>	I believe that my superior does things to further my interests	.890	4.86	1.60

Trust in immediate manager	Immediate manager consistency		.814	5.24	1.09
	Immediate manager integrity		.938	5.17	1.28
	Immediate manager information		.969	4.86	1.13
	Immediate manager concern		.904	5.14	1.28
Top management ability (7-point agreement scale adapted from Mayer and Davis, 1999)	TopAb1	Top management is very capable of performing its job.	.874	5.16	1.50
	TopAb2	Top management is known to be successful at the things it tries to do.	.895	5.14	1.47
	TopAb3	Top management has much knowledge about the work that needs done.	.866	5.17	1.56
	TopAb4	I feel very confident about top management's skills.	.913	5.04	1.62
	TopAb5	Top management has specialized capabilities that can increase our performance.	.880	4.99	1.57
	TopAb6	Top management is well qualified.	.897	5.23	1.55
Top management benevolence (7-point agreement scale adapted from Mayer and Davis, 1999)	TopBen1	Top management is very concerned about my welfare.	.881	4.32	1.79
	TopBen2	My needs and desires are very important to top management.	.927	4.23	1.80
	TopBen3	Top management would not knowingly do anything to hurt me.	.795	4.79	1.71

	TopBen4	Top management really looks out for what is important to me.	.931	4.41	1.75
	TopBen5	Top management will go out of its way to help me.	.901	4.33	1.77
Top management integrity (7-point agreement scale adapted from Mayer and Davis, 1999)	TopInt1	Top management has a strong sense of justice.	.847	4.66	1.59
	TopInt2	I never have to wonder whether top management will stick to its word.	.763	4.51	1.72
	TopInt3	Top management tries hard to be fair in dealings with others.	.857	4.85	1.62
	<i>TopInt4</i>	<i>Top management's actions and behaviors are not very consistent.</i>	.396	4.19	1.80
	TopInt5	I like top management's values.	.889	4.77	1.63
	TopInt6	Sound principles seem to guide top management's behavior.	.850	4.82	1.56
Top management trust (7-point agreement scale adapted from Mayer and Davis, 1999)	<i>TopTrust1</i>	<i>If I had my way, I wouldn't let top management have any influence over issues that are important to me.</i>	.478	3.97	1.76
	TopTrust2	I would be willing to let top management have complete control over my future in this company.	.597	3.36	1.75
	<i>TopTrust3</i>	<i>I really wish I had a good way to keep an eye on top management.</i>	.387	3.93	1.65
	TopTrust4	I would be comfortable giving top management a task or problem which was critical to me, even if I could not monitor their actions.	.695	4.32	1.64
Trust in top	Top		.868	5.12	1.40

management	management ability				
	Top management benevolence		.909	4.42	1.60
	Top management integrity		.993	4.63	1.32
	Top management trust		.939	4.07	1.23
Trust in technology (7-point agreement scale adapted from McKnight et al. 2011)	TrustTech1	I believe that most technologies are effective at what they are designed to do.	.810	5.35	1.24
	TrustTech2	A large majority of technologies are excellent.	.841	5.35	1.24
	TrustTech3	Most technologies have the features needed for their domain.	.825	5.33	1.20
	TrustTech4	I think most technologies enable me to do what I need to do.	.791	5.59	1.20
VR adoption (7-point agreement sub-scale <i>Behavioral intention to use the system</i> by Venkatesh et al., 2003)	VrAdopt1	I intend to use VR technology if available in my workplace.	.937	4.40	1.82
	VrAdopt2	I plan to use VR technology if available in my workplace.	.968	4.40	1.81
	VrAdopt3	I predict I will use VR technology if available in my workplace.	.846	4.24	1.86
Trust Motivation (7-point agreement scale adapted from	<i>MtTrust1</i>	<i>VR technology is likely to become part of the daily routine in the office.</i>	.480	3.76	1.75
	<i>MtTrust2</i>	<i>It would be difficult to imagine my work without VR in the future.</i>	.379	3.05	1.71

Shu, Q., Tu, Q., & Wang, K., 2011; Wu, Tsui, & Kinicki, 2010; Ryan, Mimis, & Koestern, 1983)	MtTrust3	A lot of knowledge sharing and information transferring are likely to be carried out through VR in my organization.	.523	3.60	1.76
	MtTrust4	I identify myself as someone who uses new technologies like VR.	.762	3.88	1.86
	MtTrust5	I am glad to be someone who uses VR.	.891	4.50	1.69
	MtTrust6	I identify with other people who use new technologies like VR.	.812	4.11	1.72
	MtTrust7	I enjoy using VR very much.	.914	4.64	1.67
	MtTrust8	VR activities are fun to do.	.879	4.84	1.58
	<i>MtTrust9</i>	<i>I think working in VR is a boring activity.</i>	.388	4.73	1.58
	MtTrust10	I would describe using VR as very interesting.	.833	4.94	1.50
	MtTrust11	I think using VR is quite enjoyable.	.872	4.87	1.52

Note: All loadings are significant at $p < .001$

Based on these results, we refined our model by removing items with factor loadings below 0.5, a common practice to improve model fit and construct validity (Hair et al., 2010).

3.3 Model Refinement and Structural Equation Modeling

After refinement, we conducted a Structural Equation Modeling (SEM) analysis that included the adjusted measurement model and incorporated control variables based on demographic and organizational factors (team leader status, gender, and age).

The refined model demonstrated improved fit indices: $\chi^2(1589) = 5155.329$, $p < .001$; CFI = 0.930; TLI = 0.926; RMSEA = 0.046 (90% CI [0.045, 0.048]); SRMR = 0.038. These fit indices indicate good model fit, according to commonly accepted criteria (Hu & Bentler, 1999; MacCallum et al., 1996). Table 14 presents the direct and indirect effects

from our structural model and fig. 7 shows a graphical representation of the resulting model.

Table 14. Direct and indirect effects of Trust in Technology, Trust in Immediate Manager, Trust in Top Management and Trust Motivation on VR adoption

Path	Standardized regression weight	SE	p-value
Direct Effects			
Trust in Technology → VR Adoption	0.021	0.044	.433
Trust in Immediate Manager → VR Adoption	-0.036	0.068	.320
Trust in Top Management → VR Adoption	0.030	0.053	.401
Trust Motivation → VR Adoption	0.785	0.097	<.001
Trust in Technology → Trust Motivation	0.346	0.033	<.001
Trust in Immediate Manager → Trust Motivation	-0.028	0.047	.540
Trust in Top Management → Trust Motivation	0.124	0.036	.008
Indirect Effects			
Trust in Technology → VR Adoption	0.272	0.046	<.001
Trust in Immediate Manager → VR Adoption	-0.023	0.070	.540
Trust in Top Management → VR Adoption	0.097	0.055	.008
Controls			
Gender → VR Adoption	-0.081	0.076	<.001
Team Leader → VR Adoption	0.028	0.079	.197
Age (55-64) → VR Adoption	0.077	0.138	.012

Note: Only significant age category shown for brevity. Full model fit: $\chi^2(1647) = 5325.403$, $p < .001$

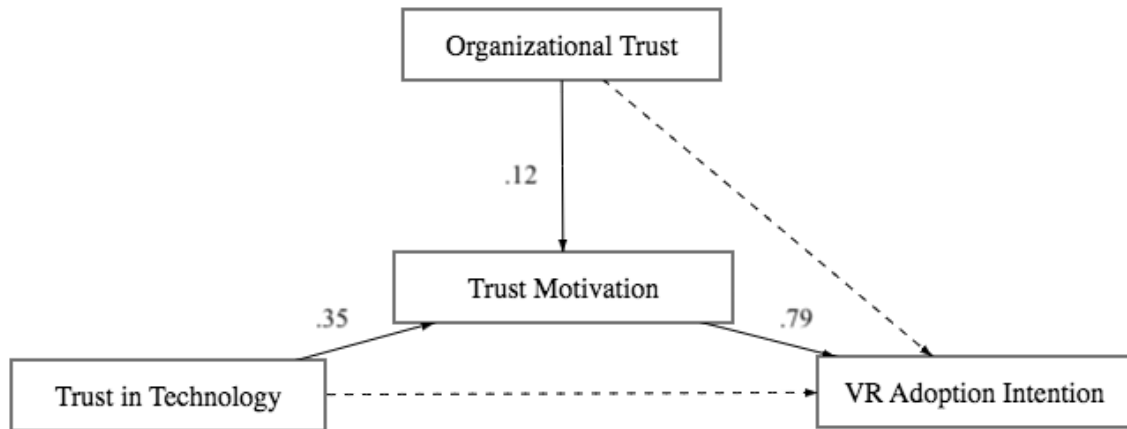


Figure 7. Graphical representation of the model

These results suggest that while trust in technology and organizational factors may not directly influence VR adoption, they play a crucial role in shaping Trust Motivation, which in turn strongly predicts VR adoption intentions.

3.4 Additional Analyses

To further explore potential differences in VR adoption and Trust Motivation based on demographic and experiential factors, we conducted a series of independent samples t-tests and one-way ANOVAs. Results are reported in Table 15.

Table 15. Summary of Additional Analyses

	VR Adoption	Trust Motivation
Gender	$t(1036) = -3.317^{***}$	$t(1036) = -6.849^{***}$
Team Leader	$t(1036) = -5.185^{***}$	$t(1036) = -6.179^{***}$
Age	$F(7, 1030) = 1.235$	$F(7, 1030) = 4.160^{***}$
Tenure	$F(6, 1031) = 1.384$	$F(6, 1031) = 4.275^{***}$
VR Experience	$F(3, 1034) = 48.49^{***}$	$F(3, 1034) = 105.7^{***}$

Note: *** $p < .001$

Gender differences were observed for both VR adoption ($t(1036) = -3.317, p < .001$) and Trust Motivation ($t(1036) = -6.849, p < .001$), indicating significant variations between male and female participants. Similarly, team leader status showed significant differences in both VR adoption ($t(1036) = -5.185, p < .001$) and Trust Motivation ($t(1036) = -6.179, p < .001$).

Age-related differences were not significant for VR adoption ($F(7, 1030) = 1.235, p = .280$), but were significant for Trust Motivation ($F(7, 1030) = 4.160, p < .001$). Post-hoc Tukey tests revealed that the 55-64 age group had significantly higher Trust Motivation compared to the 18-24 ($p = .001$) and 25-29 ($p < .001$) age groups.

While tenure did not significantly affect VR adoption ($F(6, 1031) = 1.384, p = .218$), it did have a significant effect on Trust Motivation ($F(6, 1031) = 4.275, p < .001$).

Prior VR experience showed significant effects on both VR adoption ($F(3, 1034) = 48.49, p < .001$) and Trust Motivation ($F(3, 1034) = 105.7, p < .001$). Post-hoc analyses revealed that participants with both personal and professional VR experience had significantly higher VR adoption scores compared to those with only personal use ($p < .001$) or no experience ($p < .001$). Similarly, for Trust Motivation, those with both types of experience scored significantly higher than all other groups (all $p < .001$).

4. Discussion

This study aimed to investigate the role of trust in the adoption of Virtual Reality (VR) technology in the workplace, examining the interplay between trust in technology, organizational trust, and motivational factors. Our findings provide several important insights that contribute to the literature on technology adoption, trust in organizations, and the emerging field of VR in workplace settings.

Our results partially supported Hypothesis 1, which posited a positive association between trust in technology and attitudes towards VR technology in the workplace. While we did not find a significant direct effect, we observed a substantial indirect effect mediated by Trust Motivation. This finding aligns with previous research on technology acceptance, such as the Technology Acceptance Model (Davis *et al.*, 1989) and its extensions

(Venkatesh *et al.*, 2003), which emphasize the importance of perceived usefulness and ease of use in technology adoption.

The indirect effect of trust in technology on VR adoption through Trust Motivation suggests a more complex relationship than initially hypothesized. This finding resonates with recent literature emphasizing the multifaceted nature of trust in technology adoption (Söllner *et al.*, 2016). It indicates that while general trust in technology is important, its impact on adoption intentions is primarily channeled through increased motivation to engage with the specific technology in question.

Contrary to our expectations in Hypothesis 2a and 2b, neither trust in immediate managers nor trust in top management are directly associated with VR adoption. This finding diverges from some previous research that has emphasized the role of organizational trust in technology adoption (e.g., Clegg *et al.*, 2002). However, our results did reveal an interesting indirect effect: trust in top management positively influenced Trust Motivation, which in turn strongly predicted VR adoption intentions.

This finding partially supports Hypothesis 3 and aligns with the concept of Trust Motivation proposed by van der Werff *et al.* (2019), suggesting that when employees trust their organization's leadership, they may be more motivated to engage with new technologies introduced by the organization. This result highlights the importance of considering the broader organizational context in technology adoption processes, supporting the arguments made about the social embeddedness of technology in organizations (Orlikowski, 1992; DeSanctis *et al.*, 1994).

Perhaps the most striking finding of our study is the strong direct effect of Trust Motivation on VR adoption intentions. This result underscores the importance of intrinsic motivation in technology adoption, a factor that has been highlighted in self-determination theory (Ryan & Deci, 2000) and its applications to technology use (Lee *et al.*, 2015). The central role of Trust Motivation in our model suggests that fostering enthusiasm and positive expectations about VR technology may be crucial for its successful implementation in workplaces, aligning with recent research on VR in organizational settings, which has emphasized the importance of user engagement and perceived benefits (Aufegger & Elliott-Deflo, 2022).

Our additional analyses also revealed significant differences in VR adoption and Trust Motivation across various demographic and experiential factors, aligning with and extending previous research in this area.

The observed gender differences in both VR adoption and Trust Motivation are consistent with prior studies on technology acceptance. For instance, Venkatesh and Morris (2000) found that men and women differ in their technology adoption processes, with men more strongly influenced by their perception of usefulness and women by ease of use and subjective norms. This could explain the gender disparities in our study, suggesting that organizations may need to tailor their VR implementation strategies to address gender-specific concerns and motivations.

The significant differences based on team leader status in both VR adoption and Trust Motivation highlight the crucial role of leadership in technology acceptance. This aligns with findings by Neufeld et al. (2007), who demonstrated that transformational leadership behaviors positively influence technology adoption through enhanced performance and effort expectations. Our results suggest that team leaders may be more open to VR adoption, possibly due to their role in driving organizational change and innovation.

While age did not significantly affect VR adoption, it did impact Trust Motivation, with older participants (55-64) showing higher levels of trust compared to younger groups. This contrasts with some previous research suggesting that older adults are generally less trusting of new technologies (Chopik, 2016). However, it aligns with findings by Hauk et al. (2018), who found that older workers can develop high technology-related self-efficacy when they perceive organizational support. This suggests that older workers' higher Trust Motivation might be linked to their longer tenure and deeper organizational relationships.

The strong effect of prior VR experience on both adoption intentions and Trust Motivation is particularly noteworthy. This finding supports the technology acceptance model (TAM) proposed by Davis *et al.* (1989), which posits that prior experience with a technology positively influences perceived usefulness and ease of use, thereby increasing adoption intentions. Our results extend this model to the context of VR in the workplace, suggesting that providing employees with opportunities to gain VR experience, both

personally and professionally, could significantly enhance adoption rates and trust in the technology.

5. Conclusion

This study investigated the role of trust in the adoption of Virtual Reality (VR) technology in the workplace, examining the interplay between trust in technology, organizational trust, and motivational factors. Our findings provide valuable insights into the complex processes underlying the adoption of emerging technologies in organizational settings.

Our results revealed that while trust in technology does not directly predict VR adoption intentions, it has a significant indirect effect through Trust Motivation. Trust in top management, rather than immediate supervisors, was found to influence Trust Motivation, which in turn strongly predicted VR adoption intentions. These findings highlight the complex nature of trust in technology adoption processes and underscore the crucial role of motivational factors.

5.1 Implications

Our findings have significant implications for both theory and practice. From a theoretical perspective, this study contributes to the literature on technology adoption, trust, and VR implementation in several ways.

First, it extends our understanding of how different forms of trust interact in shaping attitudes toward new technologies. The indirect effect of trust in technology through Trust Motivation suggests a more nuanced relationship than previously considered in technology acceptance models. This finding aligns with recent calls for more complex models of technology adoption that consider both individual and organizational factors (Venkatesh *et al.*, 2016).

Second, our findings contribute to the growing body of literature on motivational factors in technology adoption. The strong effect of Trust Motivation on VR adoption intentions emphasizes the importance of intrinsic motivation and positive expectations in the adoption of immersive technologies like VR. This aligns with self-determination theory

(Ryan & Deci, 2000) and its applications to technology use (Lee *et al.*, 2015), highlighting the importance of considering psychological needs in technology adoption processes.

Third, this study adds to the literature on organizational trust by highlighting the specific role of trust in top management in technology adoption processes. This finding underscores the importance of considering broader organizational factors in understanding individual-level technology adoption decisions, supporting arguments about the social embeddedness of technology in organizations (Orlikowski, 1992; DeSanctis *et al.*, 1994).

From a practical standpoint, our findings suggest several strategies for organizations seeking to implement VR technology. Organizations should focus on fostering Trust Motivation by creating enthusiasm around VR technology, which might involve providing demonstrations, training sessions, or pilot programs that allow employees to experience the potential benefits of VR firsthand.

The importance of trust in top management also suggests that visible support from leadership for VR initiatives could be crucial, as clear communication about the potential benefits of VR from top management could help build Trust Motivation among employees.

5.2 Limitations of the study

While our study provides valuable insights, it is important to acknowledge its limitations. First, our study focused on intentions to adopt VR technology rather than actual adoption behavior. While behavioral intentions are a good predictor of future behavior (Ajzen, 1991), they do not always translate directly into actions, particularly in organizational settings where adoption decisions may be influenced by factors beyond individual control.

Second, our sample was drawn from the United States, which may limit the generalizability of our findings to other cultural contexts. Trust and technology adoption processes may operate differently in cultures with different norms around organizational hierarchy or technology use.

Finally, while we focused specifically on VR technology, the rapidly evolving nature of this field means that our findings may not apply equally to all forms of VR or to future iterations of this technology.

5.3 Future research

These limitations point to several promising avenues for future research. Longitudinal studies could provide more robust evidence of the causal relationships between trust, motivation, and VR adoption, and could track how these factors evolve over time as employees gain more experience with VR technology.

Future research could also examine actual VR use in workplace settings, rather than adoption intentions. This could provide insights into the factors that influence not just the decision to adopt VR, but also how it is used and integrated into daily work practices.

Cross-cultural studies could explore how the relationships we've observed vary across different cultural contexts. This could provide valuable insights for multinational organizations considering VR implementation across diverse global workforces.

Given the central role of Trust Motivation in our findings, future research could delve deeper into the antecedents and consequences of this construct in technology adoption contexts. This could involve exploring how different organizational practices or individual characteristics influence the development of Trust Motivation.

Finally, comparative studies could examine whether similar patterns hold for other emerging technologies in the workplace, such as augmented reality or artificial intelligence. This could help develop a more general model of trust and motivation in the adoption of novel workplace technologies.

Chapter 4: Great (*virtual*) Expectations

Executive Summary:

This pilot study investigates the effectiveness of chat-based structuring interventions in electronic brainstorming (EBS) sessions compared to traditional voice-based facilitation. Using a sample of 36 participants divided into 12 virtual teams, we examined how different facilitation methods affect idea generation and participant satisfaction in a problem-solving oriented brainstorming task.

Key Findings:

1. Contrary to our hypotheses, participants in the chat-based condition reported slightly lower levels of satisfaction with the process and outcomes, particularly in the initial divergent thinking phase.
2. While not statistically significant, small differences in fluency, flexibility, and elaboration favored the chat-based condition, suggesting potential benefits for idea quality.
3. The study suggested a potential dissociation between idea quality and participant satisfaction in virtual brainstorming sessions.

Implications:

These findings suggest that chat-based interventions may be a viable alternative to voice-based facilitation in terms of idea generation outcomes. This has implications for the design of virtual collaboration tools and the facilitation of remote creative processes. The results also highlight the complexity of designing effective structuring interventions for virtual team collaboration and underscore the need for further research in this area.

While the study's limitations, including small sample size and non-ecological setting, necessitate cautious interpretation, it provides valuable insights into the challenges and opportunities of virtual team creativity. These findings contribute to our understanding of how organizations can effectively facilitate creative processes in increasingly digital and remote work environments.

Introduction

The contemporary workplace is undergoing a profound transformation, driven by both technological advances and evolving communication dynamics. A pivotal shift in the modern workforce lies in the increasing specialization of skills, often necessitating collective efforts and the amalgamation of diverse expertise (Cortes & Salvatori, 2019). As the demands of the job market become more complex, teamwork has become a cornerstone of productivity and innovation, emphasizing the significance of effective collaboration among team members. Yet, coordinating teams in a virtual context brings forth its own set of challenges. The physical dispersion of team members, coupled with the intricate web of digital communication, demands effective strategies to ensure seamless collaboration (Hertel, *et al.* 2005).

As explored in the previous chapters, the shift towards remote work has presented both opportunities and challenges for organizations and employees alike. While remote work offers increased flexibility and potential for improved work-life balance (Felstead & Henseke, 2017; Galanti *et al.*, 2021), it also introduces new complexities in workplace dynamics, particularly in terms of communication, collaboration, and organizational culture (Kniffin *et al.*, 2021).

Building on our findings from Chapter 1, which examined the effects of mandatory remote working during the pandemic on stress and remote working opinions among Italian workers, and Chapter 2, which investigated the role of environmental sensitivity and leadership styles in workplace well-being, this chapter turns its focus to team dynamics in virtual environments. As we explored in Chapter 3, the adoption of new technologies like Virtual Reality (VR) in the workplace is influenced by various factors, including trust in technology and organizational leadership. However, questions remain about how these technologies affect working teams and whether traditional behavioral dynamics observed in face-to-face team environments translate to virtual settings.

Literature on work teams has identified several factors that can hinder or enhance collaboration. Social loafing, defined as the tendency for individuals to exert less effort when working in a group compared to when working alone (Latane *et al.*, 1979), and

evaluation apprehension, the fear of being judged negatively by others (Diehl & Stroebe, 1987), are recognized as potential barriers to effective teamwork. Conversely, high *organizational identification*, rooted in Social Identity Theory (Tajfel & Turner, 1979), can positively influence team performance and collaboration.

Remote workers face specific challenges that may impact these dynamics. The social isolation and lack of informal communication characteristic of remote work environments (Galanti *et al.*, 2021) can impede the formation of strong interpersonal bonds among team members. Simultaneously, the enhanced surveillance capabilities and “always-on” mentality associated with remote work (Waizenegger *et al.*, 2020) may lead to increased stress and potential resentment towards leadership figures, whose influence on employee well-being and attitudes has been demonstrated in our previous chapters.

In this context, the role of virtual team collaboration tools becomes increasingly critical. Electronic brainstorming, a method of idea generation that leverages digital technologies, has emerged as a potential solution to overcome some of the limitations of traditional face-to-face brainstorming (Dennis & Williams, 2003). While electronic brainstorming can reduce certain barriers to creativity, such as evaluation apprehension (Zhou *et al.*, 2019), it also introduces new challenges related to coordination and facilitation in virtual environments.

A promising avenue within this digital landscape is the application of structuring interventions in online meetings, specifically aimed at generating ideas through Brainstorming Techniques (Paulus *et al.*, 2013; Seeber *et al.*, 2017). Previous research has demonstrated the effectiveness of these interventions in enhancing creativity and productivity, positioning them as valuable tools for virtual team collaboration.

However, there is a crucial caveat to consider: these interventions often rely on the guidance of a trained facilitator, typically a human actor. While facilitators bring valuable expertise and guidance to the table, they also introduce a human element that can be prone to error. This reliance on human facilitators, who are often managers or supervisors, may inadvertently exacerbate social obstacles, including the fear of being judged (Kerr & Hertel, 2011). It is against this backdrop that our research sets its sights.

This chapter presents a pilot study that shifts our focus from individual-level factors to team dynamics, exploring how virtual teams approach a problem-solving oriented brainstorming task under two conditions: with a fully present facilitator providing voice instructions, and with chat-based instructions. By examining these different facilitation methods, we aim to contribute to the growing body of literature on virtual team collaboration and address the research question:

1. How chat-based structuring interventions affect EBS sessions' outcomes and participants' satisfaction?

Through this investigation, despite its inherent limitations (which will be discussed in detail in paragraph 5.2), we seek to bridge the gap between our understanding of individual responses to remote work and the collective performance of virtual teams.

The remainder of this chapter is structured as follows: first, we provide a focused review of the literature on electronic brainstorming, virtual team collaboration, and structuring interventions. We then detail our experimental methodology, including participant recruitment, task design, and our approach to data analysis. Following this, we present our findings, noting the potential benefits of chat-based interventions for idea quality in virtual brainstorming sessions. We then discuss the implications of these findings for virtual team management and creativity facilitation in remote work environments. The chapter concludes with a summary of key insights from this pilot study and outlines potential directions for more extensive future research in the area of virtual team creativity and collaboration.

1. Theoretical background and hypotheses development

1.1 Team Creativity

Creativity is a multifaceted concept that involves generating novel and valuable ideas, solutions, or outcomes. It encompasses both the generation of new ideas and the ability to connect existing ideas in innovative ways (Amabile, 1996). In the context of teams, fostering creativity is crucial for problem-solving, idea generation, and innovation.

Team creativity can be influenced by various factors, including team composition, leadership, organizational culture, and task characteristics (Paulus & Nijstad, 2003): research has shown that diverse teams, in terms of backgrounds, expertise, and perspectives, often exhibit higher levels of creativity due to the broader range of knowledge and experiences they can draw upon (Milliken *et al.*, 2003). However, diversity can also lead to challenges in communication and consensus-building, which may hinder creative processes if not managed effectively (Mannix & Neale, 2005).

Leadership also plays a critical role in fostering team creativity, with transformational leadership styles generally associated with higher levels of team creative performance (Shin & Zhou, 2003). Organizational support for creativity, including resources, encouragement, and recognition of creative efforts, has also been found to positively impact team creativity (Amabile *et al.*, 1996). Moreover, the nature of the task and how it is structured can significantly influence team creative outcomes. For instance, tasks that are challenging yet achievable, and those that allow for autonomy and experimentation, tend to promote higher levels of creativity (Shalley & Gilson, 2004).

Despite these potential benefits, team creativity also faces challenges such as social loafing, where individuals exert less effort in a group setting (Karau & Williams, 1993), and evaluation apprehension, where fear of negative judgment inhibits idea sharing (Diehl & Stroebe, 1987).

1.1.1 Social loafing

One of the significant challenges in team creativity is social loafing (Latane *et al.*, 1979), which refers to the tendency of some team members to reduce their individual efforts in a group setting. This phenomenon can hinder creativity by diminishing the motivation and contributions of team members, especially in the absence of face-to-face interactions (Chidambaram & Tung, 2005; Alnuaimi *et al.*, 2010).

Indeed, while social loafing may happen also in collocated face-to-face teams, facilitated by a lack of social control, direct supervision, and an increase in team size, technology-supported teams, particularly those with dispersed members (i.e.: members being in different physical locations and using electronic means to communicate) who

communicate electronically, face even bigger challenges. Alnuaimi *et al.* (2010) found that the primary reasons for social loafing in virtual teams are the *diffusion of responsibility*, and the *reduced visibility of individual contributions*: team members may feel less accountable for their efforts when they are not physically present with their colleagues. This reduction in perceived accountability leads to decreased motivation and effort, which get worse as the team size increases.

1.1.2 Evaluation Apprehension

Another cumbersome issue commonly faced in team performing creative tasks is Evaluation Apprehension, a psychological concept that involves the fear of negative social consequences resulting from one's actions. It can manifest as a fear of disapproval, the concern of giving a bad impression, and the protection of one's self-image. People may withhold sharing their ideas within a group due to the anticipation of these negative consequences (Diehl & Stroebe, 1987).

Evaluation apprehension has been observed to limit individuals, especially in sharing their most original ideas (Wieland *et al.*, 2022). Digital tools, however, seem to enable the benefits of collaboration, while also reducing evaluation apprehension (Dennis & Valacich, 1993; Bittner *et al.*, 2019; Tavanapour *et al.*, 2019; Geerts *et al.*, 2021). Due to the anonymity and reduced social pressure associated with electronic communication, participants may feel more comfortable sharing their unique and unconventional ideas without fear of judgment (Zhou *et al.*, 2019), thus leading to increased idea diversity and creativity. Additionally, electronic brainstorming often offers asynchronous interactions, allowing participants to contribute ideas at their own pace and convenience, which can be especially beneficial for accommodating different schedules and time zones.

1.1.3 Organizational Identification

Organizational Identification refers to the extent to which an individual defines themselves in terms of their membership in a particular organization (Ashforth & Mael, 1989). It is rooted in Social Identity Theory (Tajfel & Turner, 1979) and represents a specific form of social identification where employees perceive a sense of oneness with or belongingness to their organization. High levels of organizational identification have been associated with

numerous positive outcomes, including increased job satisfaction, organizational citizenship behaviors, and performance (Riketta, 2005).

In the context of team creativity, organizational identification can play a crucial role. Employees who strongly identify with their organization are more likely to internalize organizational goals and values, leading to increased motivation and effort in creative tasks (Hirst *et al.*, 2009).

Moreover, organizational identification can foster a sense of psychological safety within teams, which is conducive to idea sharing and risk-taking – essential components of creative processes (Carmeli *et al.*, 2010). However, excessive identification might also lead to groupthink or reduced diversity of ideas, highlighting the complex relationship between organizational identification and team creativity (Haslam *et al.*, 2003).

1.2 Traditional and Electronic Brainstorming

Traditional face-to-face brainstorming is a well-established, although questioned (Furnham, 2000), method for generating creative ideas within a group setting. In this approach, a team of individuals assembles in a physical space, such as a meeting room, to engage in collaborative idea generation (Osborn, 1957). Members typically sit together and take turns suggesting ideas related to a specific problem or topic, and engage in real-time verbal exchanges, allowing for immediate feedback and visual cues, such as body language and facial expressions.

Electronic brainstorming, also known as e-brainstorming, represents an innovative approach to idea generation that leverages digital technologies. In contrast to traditional face-to-face brainstorming, electronic brainstorming occurs in a virtual environment where participants use electronic communication tools to collaborate and share ideas, such as dedicated software, email, instant messaging, and chat-based platforms (Dennis & Williams, 2003).

The investigation into the capabilities and constraints of online brainstorming methodologies has been a central area of inquiry within diverse academic domains such as Computer Science, Business, Management and Accounting, Social Sciences, Decision Sciences, and Psychology, particularly emerging since the mid-1980s. Nevertheless,

comprehensive literature examining this subject remains somewhat constrained, with the predominant focus residing in comparative analyses between conventional face-to-face sessions and their remote counterparts (Gallupe, *et al.*, 1991; Pinsonneault, *et al.*, 1999; DeRosa, *et al.*, 2007).

Documents by year

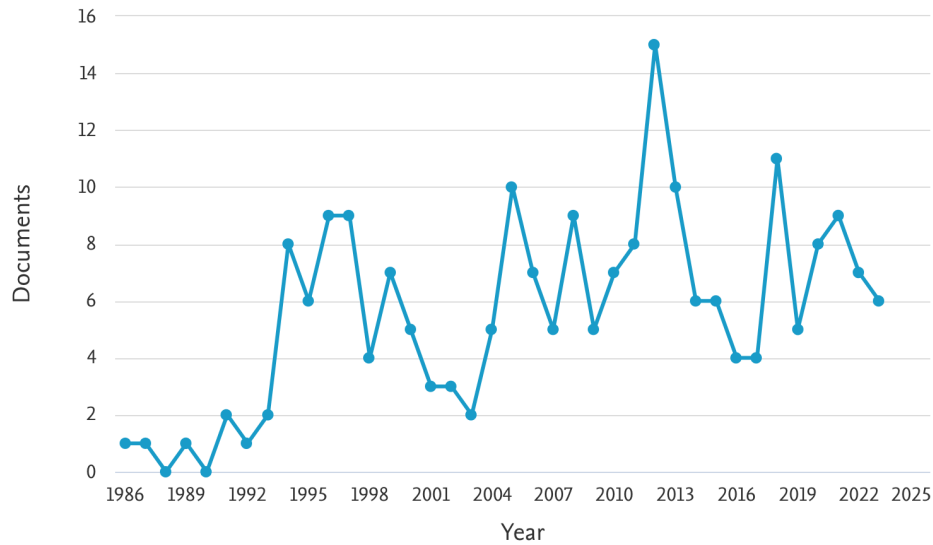


Figure 8. Number of documents mentioning relevant keywords (e.g.: “online brainstorm*”, “electronic brainstorm*”) per year of publication.

Documents by subject area

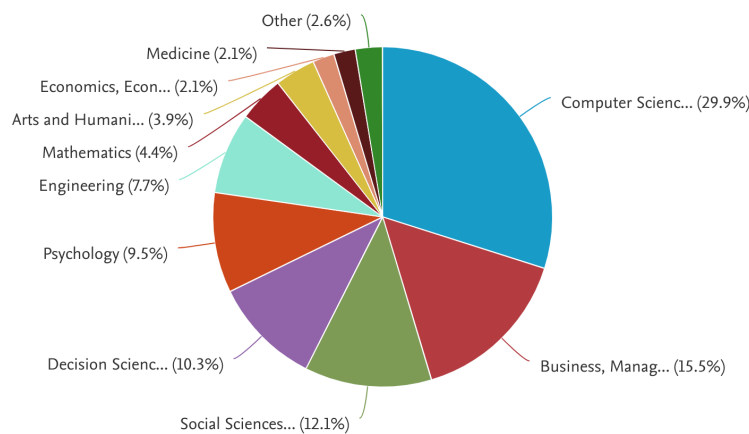


Figure 9. Percentage of documents mentioning relevant keywords (e.g.: “online brainstorm*”, “electronic brainstorm*”) per subject area.

1.2.1 The role of facilitator

A skilled facilitator plays a pivotal role in the success of brainstorming sessions: their presence is invaluable in guiding the group through the intricate processes of idea generation, evaluation, and convergence (Hertel *et al.*, 2005).

Facilitators help create an environment that fosters creativity and collaboration, ensuring that participants feel comfortable sharing their thoughts and ideas. They can also employ various techniques to stimulate divergent thinking and manage the flow of the session, such as setting clear goals, encouraging equal participation, and maintaining a focus on the topic.

Facilitators play a crucial role in mediating conflicts, resolving differences of opinion, and steering the group toward consensus when necessary. Furthermore, they assist in the convergence phase, helping the team filter through the generated ideas and select the most promising ones for further development. Thus, they are not only responsible for the overall smooth operation of the brainstorming session but also for maintaining the energy and engagement of participants. They ensure that the process remains on track and that the team can make the most of their collective creativity.

Despite the critical role facilitators play in the success of brainstorming sessions, managers, often tasked with this role, may face several challenges in effectively facilitating the process. One key challenge is the dual role managers typically hold within their teams. As both supervisors and participants, managers may find it difficult to balance these responsibilities during a brainstorming session. This dual role can create a power dynamic that inhibits open and candid idea-sharing. Team members may hesitate to express dissenting opinions or unconventional ideas for fear of retribution or judgment from their managers, thus impeding the creative process (Hertel *et al.*, 2005).

Time constraints can also hinder managers' ability to facilitate effectively: as they often have numerous responsibilities, and dedicating the time and attention required for a well-facilitated brainstorming session can be challenging. However, rushed or inefficient sessions can lead to unproductive outcomes and missed opportunities for innovative ideas (Paulus *et al.*, 2006).

1.2.2 Idea divergence and convergence

Effective team creativity often requires balancing divergent thinking (generating many diverse ideas) with convergent thinking (evaluating and selecting the best ideas), a process that can be facilitated through structured brainstorming techniques and collaborative problem-solving approaches (Paulus *et al.*, 2019).

With the advent of social media and online collaboration technologies, the potential for brainstorming productivity has been greatly amplified, enabling vast quantities of divergent ideas to be shared effortlessly (Hutchins, 2014). However, this increased idea generation may give rise to the challenge of information overload, as teams face an overwhelming number of ideas that cannot be adequately processed and evaluated individually (Ferreira & Antunes, 2008; Ferreira *et al.*, 2011).

Convergence, on the other hand, is the process of refining the pool of generated ideas to select and focus on a limited quantity of the most promising ones. It involves clarifying the meanings of ideas, identifying redundancies, and considering relevance to increase shared understanding. Successful convergence is essential for teams to allocate their limited time and cognitive resources effectively, as it allows them to thoroughly process and compare the selected ideas based on their individual merits. Without a successful convergence activity, teams may be left with an unmanageable number of ideas, various interpretations among team members, and underdeveloped solutions (Seeber *et al.*, 2017).

In order to streamline both the divergent and convergent processes, structuring interventions emerged as a potential solution: bundles of instructions, provided by either human facilitators or information technology (IT), they guide team members in engaging in productive actions while restraining unproductive behaviors throughout collaborative activities (Keller *et al.*, 2018). Such interventions can be directed toward the process, the task, or the utilization of supporting technology.

1.2.3 Chat-based structuring interventions

The use of chat-based structuring interventions in online brainstorming sessions holds the potential to enhance creativity and satisfaction among participants, as they can provide a structured framework for idea generation and help to overcome the challenges of idea

divergence and convergence that often arise in high-productivity brainstorming sessions (Paulus *et al.*, 2019). By guiding participants through the brainstorming process and encouraging them to organize their ideas systematically, chat-based interventions can enhance idea quality and coherence.

Moreover, participants may feel more comfortable sharing their ideas, including unconventional or risky ones, in an environment where they perceive lower social consequences (Wieland *et al.*, 2022). Additionally, chat-based structuring interventions may reduce the burden on managers who often facilitate online brainstorming sessions. These tools can guide the process, reducing the need for extensive facilitation and enabling managers to focus on content and idea evaluation (Hertel *et al.* 2005).

1.3 Hypotheses development

Building on the existing literature on electronic brainstorming (EBS) and structuring interventions in virtual team collaboration, we developed three hypotheses to address our research question.

H1: Chat-based structuring interventions will be associated with better results in terms of idea fluency, flexibility, and elaboration.

This hypothesis is grounded in recent research on the effectiveness of chat-based interventions in brainstorming sessions. Wieland *et al.* (2022) found that electronic brainstorming with a chatbot partner led to increased productivity and idea diversity.

Similarly, Omar *et al.* (2010) demonstrated that computer-mediated communication tools could enhance idea generation in group settings. We posit that chat-based structuring interventions will provide a more structured and less intimidating environment for idea generation, potentially reducing evaluation apprehension and encouraging more diverse and original contributions.

H2: Chat-based structuring interventions will be associated with better participants' satisfaction with the process.

This hypothesis draws from the work of Seeber *et al.* (2017), who explored the impact of structuring interventions on team convergence in electronic brainstorming. Their findings suggest that structured approaches can lead to more efficient and satisfying collaborative processes. Additionally, Wieland *et al.* (2022) reported positive user experiences with chat-based brainstorming partners. We hypothesize that the clear, consistent guidance provided by chat-based interventions will lead to a more satisfying process for participants compared to traditional facilitation methods.

H3: Chat-based structuring interventions will be associated with better participants' satisfaction with the outcome.

Our final hypothesis extends the expected benefits of chat-based interventions to outcome satisfaction. Seeber *et al.* (2017) found that structured interventions can lead to better convergence outcomes in team settings. Similarly, Wieland *et al.* (2022) reported high satisfaction with the ideas generated through chat-based brainstorming. We propose that the potentially higher quality and diversity of ideas generated through chat-based structuring interventions, as posited in H1, will translate into greater satisfaction with the overall outcome of the brainstorming session.

2. Methodology

2.1 Design, participants, and procedures

This pilot study employed a between-subjects experimental design to investigate the effects of chat-based structuring interventions on electronic brainstorming (EBS) sessions.

A total of 36 participants (24 female, 11 male, and 1 non-binary), aged between 22 and 50 ($M = 32.8$, $SD = 7.24$) completed the brainstorming task. Out of them, 19 had previous experience with brainstorming, while 17 had no previous experience.

Participants were invited to take part in 12 online brainstorming sessions, which were arranged individually via mail and took place via Google Meet and Jamboard. Google Meet is a video conferencing platform, allowing any Gmail user to connect and interact via their webcam, microphone and chat system. Jamboard was a (now discontinued) online tool that

allowed users to write their ideas on post-its and put them on a shared virtual board, so that everyone could post their contribution simultaneously.

Participants were randomly assigned to groups of three, with each group randomly allocated to either condition A (voice-based structuring interventions) or condition B (chat-based structuring interventions).

1. *Condition A (Voice-based structuring interventions)*: In this condition, a facilitator provided verbal instructions and guidance throughout the brainstorming session. The facilitator had their webcam on for the entire duration of the sessions. They introduced the task, provided prompts, managed time, and guided the transition between phases, following a script.
2. *Condition B (Chat-based structuring interventions)*: In this condition, instructions and guidance were provided through the chat interface of Google Meet. The facilitator didn't turn on their webcam nor their microphone and only provided instructions via messaging, following a script.

The script was the same for both conditions and included structuring interventions based on Briggs & De Vreede's (2001) thinkLets, specifically OnePage for phase 1 (idea divergence) and OneUp for phase 2 (idea convergence).

OnePage is a thinkLet recommended for small groups (up to 5 people), where all team members can contribute comments simultaneously to the same electronic page or list at the same time. In this thinkLet, the role of facilitator is to make sure the participants understand the brainstorming question or prompt, facilitate a verbal discussion to address any understanding difficulties, inform the participants of time limits, and let the participants contribute comments until they run out of ideas or until the time limit.

OneUp is a thinkLet recommended for idea convergence, where each member of the group is asked to thoroughly read the ideas emerged during the divergence phase, and select the most important item, offering both the idea and argument about why it has been chosen. All selected ideas are to be discussed, reframed and then posted on a public list for everyone to see.

2.2 Measures

2.2.1 Pre-task Survey

Prior to the brainstorming task, participants completed a pre-task survey that included:

1. **Demographic variables:** age, gender, and occupation.
2. **Personal creativity:** Measured using the Short Scale of Creative Self (Karwowski, 2011). This scale consists of 11 items rated on a 5-point Likert scale (from 1 = “Strongly disagree” to 5 = “Strongly agree”), with higher scores indicating higher levels of creative self-concept. The Cronbach’s alpha for our sample was $\alpha = .88$, indicating good internal consistency.
3. **Previous experience with brainstorming tasks:** Assessed through a “yes / no” question asking participants about their familiarity with brainstorming activities.

2.2.2 Brainstorming Task

The brainstorming task was centered around a hypothetical scenario describing a flood emergency in a fictional city, modeled after the one proposed in Seeber *et al.* (2017).

1. **Phase 1:** Participants were instructed to generate as many ideas as possible to resolve the situation.
2. **Phase 2:** Participants were asked to evaluate the proposed ideas and select the best ones.

To assess the quality of the outcomes for the two phases, we employed the following measures, drawing upon Guilford (1967):

1. **Fluency:** The total number of unique ideas generated by each group (any duplicate has been excluded);
2. **Flexibility:** The number of distinct semantic areas of the proposed ideas, categorized with the use of the LLM Claude Sonnet 3.5 (Anthropic, 2023);
3. **Elaboration:** The level of detail of the proposed ideas, measured, drawing upon Seeber *et al.* (2017), by assessing the presence of seven dimensions: *Why* (purpose),

Who (participant), *What* (object), *How* (form), *When* (time), *Where* (place), and *If* (condition);

2.2.3 Post-task Survey

Right after completing the brainstorming task, participants were asked to fill a post-task survey assessing:

1. **Satisfaction with the process:** Measured separately for Phase 1 and Phase 2 using a 5-item scale adapted from Green and Taber (1980). Items were rated on a 5-point Likert scale (from 1 = “Strongly disagree” to 7 = “Strongly agree”). The Cronbach’s alpha for our sample was .70 for Phase 1 and .80 for Phase 2, indicating acceptable internal consistency.
2. **Satisfaction with the outcomes:** Also measured separately for Phase 1 and Phase 2 using a 4-item scale adapted from Green and Taber (1980). The Cronbach’s alpha for our sample was .68 for Phase 1 and .70 for Phase 2, indicating acceptable internal consistency.

2.3 Analytic plan

We conducted our pre-task and post-task analyses using JASP. We began by examining descriptive statistics for all variables, including means, standard deviations, and ranges. We then performed a semantic categorization through the use of the Generative AI Claude.ai. Lastly, we performed independent samples t-tests to compare results in terms of fluency, flexibility, elaboration and satisfaction between the two conditions.

3. Results

3.1 Descriptive Statistics

Descriptive statistics, presented in Table 16 alongside the mean (M) and standard deviation (SD) for each variable, indicated significant correlations between satisfaction with the process and the outcomes as well. Interestingly, however, only *Satisfaction with the convergence process* (Phase 2) showed a significant association with personal creativity.

Table 16. Descriptive statistics, correlation matrix, and Cronbach's Alpha coefficients for main variables (N = 36).

Variable	Mean (SD)	1	2	3	4	5
1. Personal Creativity	3.88 (0.56)	(.88)				
2. Satisfaction with the Process (Phase 1)	4.62 (0.45)	.14	(.70)			
3. Satisfaction with the Process (Phase 2)	4.82 (0.35)	.34**	.53***	(.80)		
4. Satisfaction with the Outcome (Phase 1)	4.57 (0.52)	.03	.34**	.34**	(.68)	
5. Satisfaction with the Outcome (Phase 2)	4.54 (0.54)	-.06	.24	.43***	.85***	(.70)

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Values in parentheses on the diagonal represent Cronbach's Alpha coefficients.

3.2 Brainstorming Session Outcomes

The brainstorming sessions produced a total of 323 proposed ideas during Phase 1 and a total of 90 selected ideas during Phase 2, with an overall average of 26.92 ideas per group during Phase 1 (SD = 8.13) and 7.50 ideas per group during Phase 2 (SD = 2.75). When considering separately Condition A (voice-based structuring interventions) and Condition B (chat-based structuring interventions), the average fluency was 24.83 (SD = 6.49) for Condition A and 29.00 (SD = 9.63) for Condition B.

A semantic categorization was conducted to measure flexibility of each item through the use of the generative AI tool Claude.ai. Results were manually supervised and optimized. Claude categorization was deemed correct for 312 out of 323 items; the remaining 11 items were re-assigned to the most appropriate existing category. Proposed ideas distribute into 12 semantic areas as follows.

Table 17. Semantic categorization of Brainstorming sessions

Categorization	# of ideas (Phase 1)	# of ideas (Phase 2)
Emergency Response and Coordination	83	21
Infrastructure and Services	58	13
Resource Management and Distribution	50	12
Shelter and Housing	35	9
Communication and Information	27	10
Health and Medical Support	21	8
Psychological Support and Community Engagement	16	6
Financial and Administrative Measures	11	1
Security and Safety	7	4
Risk Assessment	5	2
Long-Term Recovery and Planning	6	3
Education and Work	4	1

Overall, the average flexibility was 8.00 (SD = 1.76) for Phase 1 and 5.33 (SD = 1.37) for Phase 2. When considering separately Condition A (voice-based structuring interventions) and Condition B (chat-based structuring interventions), the average flexibility was 7.17 (SD = 1.17) for Condition A and 8.83 (SD = 1.94) for Condition B in Phase 1, and 4.83 (SD = 1.70) for Condition A and 5.83 (SD = 0.98) for Condition B in Phase 2.

The average elaboration was 1.98 (SD = 0.19) for Phase 1 and 1.69 (SD = 0.38) for Phase 2. When considering separately Condition A (voice-based structuring interventions) and Condition B (chat-based structuring interventions), the average elaboration was 1.90 (SD = 0.22) for Condition A and 2.05 (SD = 0.12) for Condition B in Phase 1, and 1.49 (SD = 0.35) for Condition A and 1.90 (SD = 0.32) for Condition B in Phase 2.

3.3 Independent samples t-tests

To ensure that groups assigned to condition A and conditioned B were homogeneous in terms of perceived personal creativity, we first conducted an independent sample t-test, which confirmed no significant differences ($t = 0.312$, $p = 0.757$).

Then, we performed t-tests to test our hypotheses, positing that chat-based structuring interventions would be associated with higher fluency, flexibility, and elaboration, as well as higher participants' satisfaction with the process and the outcomes.

Table 18. Independent samples t-test

	t	df	p
Fluency (Phase 1)	0.879	10.00	.400
Fluency (Phase 2)	1.056	10.00	.316
Flexibility (Phase 1)	1.802	10.00	.102
Flexibility (Phase 2)	1.303	10.00	.222
Elaboration (Phase 1)	1.541	10.00	.154
Elaboration (Phase 2)	2.094	10.00	.063
Satisfaction with process (Phase 1)	-2.024	34.00	.051 ^a
Satisfaction with process (Phase 2)	-0.759	34.00	.453
Satisfaction with outcome (Phase 1)	-2.426	34.00	.021
Satisfaction with outcome (Phase 2)	-1.574	34.00	.125

Note. Student's t-test. ^a Levene's test is significant ($p < .05$), suggesting a violation of the equal variance assumption

Our hypotheses were not confirmed as, contrary to our expectations, participants assigned to condition B (chat-based structuring interventions) reported, on average, lower levels of satisfaction with the process and the outcomes in Phase 1. Notably, however, there are no significant differences in satisfaction with the process nor the outcomes in Phase 2, nor in the quality of ideas proposed in either phase.

4. Discussion

The results of our pilot study on chat-based structuring interventions in electronic brainstorming sessions yielded some unexpected findings that challenge our initial hypotheses. While we anticipated that chat-based interventions would lead to improved outcomes in terms of idea quality and participant satisfaction, our data did not support these expectations. However, these results offer valuable insights into the complexities of virtual team collaboration and the nuances of facilitating creative processes in online environments.

With regards to our first hypothesis (H1), which posited that chat-based structuring interventions would be associated with better results in terms of idea fluency, flexibility, and elaboration, we observed some promising trends, although we found no statistically significant differences between Condition A and B.

Our second and third hypotheses (H2 and H3), which predicted higher participant satisfaction with the process and outcomes in the chat-based condition, however, were not supported by the data. In fact, we observed slightly lower levels of satisfaction in the chat-based condition, particularly for Phase 1 of the brainstorming process.

5. Conclusion

This pilot study on chat-based structuring interventions in electronic brainstorming (EBS) sessions has provided insights into the complexities of virtual team collaboration, despite not confirming our initial hypotheses. While our results did not show significant differences

between chat-based and voice-based interventions in terms of idea quality or participant satisfaction, they nonetheless offer important lessons for both researchers and practitioners in the field of virtual team management.

5.1 Implications

The implications of our findings are multifaceted and potentially far-reaching for organizational practices. Notably, the absence of strong effects of intervention type on idea quality suggests that managers might have more flexibility in how they approach virtual brainstorming sessions. For instance, the use of automated chat-based interventions, at least for initial idea divergence and convergence phases, could be a viable alternative to traditional facilitator-led sessions. This approach could potentially save time for managers and allow them to join brainstorming sessions at a later stage, focusing their efforts on idea evaluation and refinement rather than the entire process.

Furthermore, our observation of slight (albeit not statistically significant) differences favoring chat-based interventions in terms of fluency, flexibility, and elaboration, contrasted with lower satisfaction scores, points to an intriguing dissociation between process experience and outcome quality, and suggests that the most effective approach might be a hybrid method. For example, organizations could consider using chat-based interventions for task presentation and initial idea generation to capitalize on potential benefits for idea quality, while incorporating voice-based elements to enhance participant satisfaction and engagement. Such a hybrid approach could potentially leverage the strengths of both methods, addressing the apparent trade-off between idea quality and participant satisfaction observed in our study.

5.2 Limitations of the study

Our pilot study's findings must be interpreted in light of several important limitations. The small sample size of 36 participants across 12 brainstorming sessions significantly limits the statistical power of our analyses.

Another crucial limitation lies in the non-ecological nature of our experimental environment: unlike real workplace scenarios, our participants were strangers to each other, and the facilitator was a researcher rather than a work supervisor. This artificial setup likely

influenced participant behavior and perceptions in ways that may not accurately reflect real-world virtual team dynamics, as the lack of established relationships and organizational context may have affected how participants engaged with the task and responded to the interventions (Paulus & Brown, 2007), potentially masking effects that might be more pronounced in authentic workplace settings.

5.3 Future research

The limitations and unexpected findings of our study open up several promising avenues for future research. First and foremost, larger-scale studies with more substantial sample sizes are needed to overcome the statistical limitations of our pilot study. These studies should aim to replicate our findings and further explore the potential differences between chat-based and voice-based interventions in electronic brainstorming.

Future research should also strive for greater ecological validity by conducting studies in real organizational settings with established teams. This approach would allow researchers to examine how pre-existing relationships, organizational culture, and authentic work contexts influence the effectiveness of different structuring interventions in virtual brainstorming sessions.

Longitudinal studies could provide valuable insights into how the effectiveness of chat-based interventions evolves over time as teams become more familiar with the technology and develop their own strategies for virtual collaboration. Such studies could also explore the long-term impacts of different intervention types on team dynamics, creativity, and overall productivity.

The observed dissociation between idea quality and participant satisfaction warrants further investigation. Future studies could delve deeper into this phenomenon, exploring the factors that contribute to this disconnect and developing strategies to optimize both outcome quality and participant experience in virtual brainstorming sessions.

Finally, the potential of hybrid approaches combining elements of chat-based and voice-based interventions presents an exciting area for future research. Studies could systematically vary the timing and mode of different intervention elements to identify the most effective combinations for enhancing both idea quality and participant satisfaction.

Conclusion

This doctoral thesis, comprising three interconnected studies and a pilot study, provided a comprehensive examination of the evolving nature of work in the post-pandemic era.

By investigating remote work experiences during COVID-19 lockdowns, the role of environmental sensitivity in workplace well-being, the adoption of Virtual Reality (VR) technology, and creativity in virtual teams, our findings revealed several key themes that transcend individual studies and contribute to our understanding of the future of work.

1. Trust the (*leadership*) process

A central theme emerging across the three main studies presented is the critical role of trust in shaping workplace dynamics. In the first study on remote work, trust in immediate managers emerged as a significant predictor of positive remote work attitudes and lower stress levels (Eurofound, 2020). This finding aligns with recent literature emphasizing the importance of trust-based leadership in remote work settings (Contreras *et al.*, 2020). The third study on VR adoption further emphasized the importance of trust, showing that trust in top management indirectly influenced technology adoption intentions through Trust Motivation. These findings collectively support and extend existing research on the importance of trust in organizational contexts (Mayer *et al.*, 1995; Dirks & Ferrin, 2002), highlighting its relevance in both traditional and emerging work arrangements.

Leadership styles emerged as another critical factor across the studies. The study presented in Chapter 2 demonstrated that democratic and let-it-be leadership styles moderated the relationship between job stressors and well-being, particularly for highly sensitive individuals. This finding aligns with previous research on the positive impact of participative and supportive leadership styles on employee outcomes (Spreitzer & Porath, 2012). Interestingly, the findings from our first study, presented in Chapter 1, on the importance of trust in immediate managers during remote work can be seen as complementary to this, suggesting that effective leadership in various work contexts involves building trust and adopting supportive styles.

2. The human factor

Individual differences played a significant role in all three studies, revealing the complexity of modern workforces. The study we presented in Chapter 1 found unexpected gender differences, with women showing more positive perceptions of remote work effects than men, contrasting with some earlier pandemic studies (e.g., Eurofound, 2020; Çoban, 2022). Age effects were observed in both the first and third studies, with older employees generally reporting less positive effects of remote work and showing different patterns of technology adoption. The second study introduced the concept of environmental sensitivity, demonstrating how individual differences in sensitivity moderate the effects of workplace factors on well-being. These findings collectively underscore the importance of considering individual differences in workplace policies and practices, aligning with calls for more personalized approaches to management (Schwedel *et al.*, 2022).

Well-being and stress emerged as key outcome variables across the studies. The first study found that positive attitudes towards remote work were associated with lower stress levels, while the second study directly examined the impact of job stressors and leadership styles on well-being. These findings contribute to the growing body of literature on workplace well-being (e.g., Bakker & Demerouti, 2017), highlighting the complex interplay between work arrangements, individual characteristics, and employee well-being.

3. Embracing change

The theme of adaptation to change runs through all three studies, reflecting the broader context of rapid workplace transformations accelerated by the COVID-19 pandemic. The first study captured how employees adapted to sudden remote work mandates, the second examined how different individuals respond to various leadership styles, and the third investigated factors influencing adaptation to new technologies. These findings contribute to our understanding of organizational change and adaptation (e.g., Oreg & Sverdlik, 2011), highlighting the role of individual differences and organizational factors in facilitating successful transitions.

Organizational factors emerged as significant influencers of individual outcomes across the studies. The importance of trust in immediate managers and top management, the impact of leadership styles, and the role of organizational support in technology adoption all point to the critical role of organizational context in shaping employee experiences and behaviors. This aligns with theories of organizational behavior that emphasize the interplay between individual and organizational factors (Johns, 2006).

Finally, all studies touch on aspects of technology adoption and use, from the sudden shift to remote work technologies in the first study, to the focus on VR adoption in the third and the use of virtual collaboration tools in the pilot study presented in Chapter 4. These findings contribute to our understanding of technology acceptance in workplace contexts, extending existing models like the Technology Acceptance Model (Davis et al., 1989) by considering a broader range of factors including trust, leadership, and individual differences.

The findings suggest that organizations need to adopt nuanced, adaptive approaches to workplace management, considering both individual and organizational factors in navigating the challenges and opportunities of the post-pandemic work landscape. Future research could further explore these interconnections, perhaps examining how the factors identified here interact in longitudinal studies or across different cultural contexts.

4. To Infinity and Beyond

As we stand on the cusp of a new era in workplace dynamics, the future of organizational research promises to be as exciting and unpredictable as the evolving nature of work itself (Lim, 2023). The landscape that emerges from our studies paints a picture of a workplace that is increasingly flexible, technology-driven, and attuned to individual needs and preferences.

4.1 Rise of flexibility

The trend toward flexible working arrangements, including remote and hybrid work models, is set to continue its upward trajectory (Eurofound, 2023). This shift is complemented by the growing popularity of other flexible work arrangements, such as the

four-day workweek, which has shown promising results in large-scale trials (Campbell, 2023). These developments signal a move away from the traditional “one-size-fits-all” approach to work, towards a more customizable, employee-centric model.

Future research in this area will need to further explore the evolving nature of work needs, values, and expectations. As Schwedel *et al.* (2022) suggest, the very concept of an “average worker” is becoming obsolete, necessitating more nuanced, personalized approaches to workplace management. This shift calls for a reevaluation of established relationships between individual factors, organizational factors, and work outcomes. Longitudinal studies will be crucial in tracking how these relationships evolve over time and across different flexible work arrangements.

4.2 Captains of the virtual Enterprise

The changing workplace landscape places Human Resources departments and team leaders at the forefront of organizational adaptation. As our studies have shown, trust in immediate managers and leadership styles play crucial roles in shaping employee experiences and outcomes. However, while there is a general consensus on the positive effects of good leadership (Dirks & Ferrin, 2002), what constitutes “good leadership” in an increasingly hybrid, evolving, and fluid workforce remains a question ripe for exploration.

Indeed, leading in virtual and hybrid environments requires a distinct set of skills and a different approach compared to traditional in-person leadership (Contreras *et al.*, 2020; Kniffin *et al.*, 2021). Future studies should aim to develop and validate new models of leadership effectiveness that account for the unique challenges and opportunities presented by flexible work arrangements.

4.3 Harder, better, faster, smarter

Technology will undoubtedly play an increasingly central role in our work lives. The rapid advancements in artificial intelligence, exemplified by the emergence of large language models like GPT-4 (OpenAI, 2023), promise to revolutionize numerous aspects of work. Simultaneously, extended reality technologies (augmented, virtual, and mixed reality) are gradually finding their place in various industries for training, work meetings, and customer service (PwC, 2022).

However, as our research and others have shown, the pervasiveness of technology in the workplace is not without its challenges. The concepts of “technostress” (Tarafdar *et al.*, 2019) and “Zoom fatigue” (Bailenson, 2021) have gained prominence, highlighting the potential negative impacts of technology on employee well-being. Future research must continue to investigate these phenomena, developing strategies to mitigate their effects while maximizing the benefits of technological advancements.

Furthermore, as various integrated VR, document-sharing, and project management platforms emerge, comparative studies will be crucial to identify the key factors that influence perceived helpfulness, ease of use, and reliability of these technologies from an employee perspective (McKnight *et al.*, 2011).

4.4 A new hope

When my doctoral journey began, in November 2021, the world of work was in the throes of pandemic-induced upheaval, and the concepts of work-life balance and the Great Resignation dominated discourse, painting a picture of impending radical change.

Three years on, while the apocalyptic predictions have not materialized, the future of work remains in flux – volatile, evolving, and full of unknowns, yet undeniably fascinating. As we reflect on the findings from our three studies and pilot investigation, a cohesive picture of the post-pandemic work experience begins to emerge. Drawing together the diverse threads of our research, we propose a preliminary framework that integrates the individual, organizational, and technological factors that shape modern work life.

This framework, grounded in our empirical findings and existing literature about remote work (Gajendran & Harrison, 2007; Charalampous *et al.*, 2019), leadership (Inceoglu *et al.*, 2018), trust (Legood *et al.*, 2023) and technology acceptance (Venkatesh *et al.*, 2016) in the workplace, suggests that the post-pandemic work experience is fundamentally shaped by the interplay of three key dimensions:

1. **Individual Factors:** These encompass the unique characteristics and predispositions that employees bring to their work. Our research highlights the importance of demographic variables such as age and gender (Chapter 1), as well as psychological constructs like environmental sensitivity (Chapter 2) and general trust in technology (Chapter 3). These

factors align with established literature on individual differences in organizational settings (e.g., Judge & Zapata, 2015) and extend them to the post-pandemic context.

2. **Organizational factors:** This dimension captures the structural and cultural elements of the work environment. Our studies emphasize the role of managerial and organizational trust (Chapters 1 and 3), leadership styles (Chapter 2), and work arrangements such as remote or hybrid models (Chapters 1 and 4). These factors build upon existing research on organizational climate and leadership (e.g., Inceoglu et al., 2018) while addressing the unique challenges of post-pandemic work settings.
3. **Technological factors:** The third dimension acknowledges the critical role of technology in shaping modern work experiences. Our research explores elements such as experience with technology, propensity for remote work, and adoption of new technologies like VR (Chapter 3). We also consider the potential negative impacts of technology, such as techno-stress (Tarafdar et al., 2019), which has become increasingly relevant in the context of widespread remote work.

These three dimensions do not operate in isolation but interact in complex ways to shape employee experiences, attitudes, and behaviors. For instance, our research suggests that individual differences in environmental sensitivity moderate the impact of leadership styles on employee well-being (Chapter 2), while trust at both the individual and organizational level influences the adoption of new technologies (Chapter 3).

By proposing this framework, we aim not to provide definitive answers, but to offer a structured approach for future research in this rapidly evolving field, as organizations continue to navigate the changing landscape of work in the post-pandemic era.

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