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In a digitalising Europe: Unfolding knowledge from working from home during the COVID-19 pandemic in Italy and Denmark

Christine Ipsen^{a,*}, Kathrin Kirchner^a, Ettore Bolisani^b and Enrico Scarso^b

^a*Department of Management, Technical University of Denmark, Lyngby, Denmark*

^b*Department of Management and Engineering, University of Padova, Vicenza, Italy*

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Abstract.

BACKGROUND: Digital applications have been vital to ensuring business continuity during the COVID-19 pandemic. Indeed, digital transformation is considered key to shaping Europe’s future, including the opportunity for hybrid work. Consequently, a central issue is the experience and perception of workers and the effect on their mental well-being.

OBJECTIVE: Building on the assumption that the more ‘digitalized’ and ‘experienced with working from home (WFH),’ the more positive peoples’ perceptions are, this paper explores how workers in Italy and Denmark perceived WFH during the first COVID-19 lockdown from a psychosocial perspective and what lessons could be drawn for policy and industry.

METHODS: Ranking top and bottom respectively on the European Digital Economy and Society Index (DESI) and different pre-pandemic experiences of WFH, data about WFH perceptions and mental well-being were collected among Danes and Italians via a survey from March to May 2020. The data were analyzed using descriptive statistics, t-Tests, and ANOVA.

RESULTS: The combination of high rank and pre-experience of WFH did not result in a positive perception of WFH. Mental well-being of Danes were mostly affected and they experienced WFH to be more challenging than the Italians, where the key disadvantages were related to “Home office constraints” and the isolation that followed.

CONCLUSION: When digitalizing Europe and workplaces are likely to offer people the opportunity to have hybrid work, the results highlight how national conditions affect the prospects of the new ways of working including people’s mental well-being and where actions are most needed for policy and industry.

Keywords: Well-being, teleworking, social isolation, policy, gender

1. Introduction

Working from home (WFH) has increased in recent years, especially in industrialized countries [1]. The

COVID-19 crisis has also shown that this working modality can be extended to more and more sectors and jobs [2]. Consequently, as stated by some authors [3–6], companies and governments may be pushing toward the continued use of WFH. Supranational institutions, such as the European Union (EU), are also considering how these experiences can be extended [7, 8].

This ‘enthusiasm’ about WFH is due to its potential benefits, which have been emphasized in the

*Address for correspondence: Christine Ipsen, Associate Professor, PhD, Department of Management, Technical University of Denmark, Akademivej, Building 358, DK-2800, Kgs. Lyngby, Denmark. E-mail: chip@dtu.dk; ORCID: <https://orcid.org/0000-0002-2394-5571>.

literature [9–12] — from less traffic to more comfortable working conditions, from more free time for workers to reduced office costs. WFH is not a new phenomenon. Since telework was introduced as a way of working and telecommuting was defined as a concept in the 1970s by Nilles [13], research has been concerned with the positive and negative effects on climate, transport, and people. Regarding the latter, research has looked at the physical and psychosocial hazards where the physical hazards typically relate to sedentary work [14, 15] and the exposure to visual display terminal (VDT) that can affect worker’s health such as visual discomfort and musculoskeletal disorders (MSD) and related problems. The psychosocial hazards and mental well-being problems include loneliness, isolation, and poor mental health [16, 17]; however, the change in the work-life balance may also have a positive effect on the mental health [16]. A study of knowledge workers’ work situation has come to a similar conclusion; that the same work-related issue or circumstance can be experienced in different ways; as an opportunity or a source of stress affecting people’s mental well-being [18].

A key element in telework and WFH is the advancement of digital technologies. Today, low-cost and ubiquitously accessible equipment is increasingly available, and, despite the differences and risk of power concentration [19], the diffusion and interconnection of systems and networks is progressing even in peripheral areas [20]. Accessing an adequate communication infrastructure and using effective information and communications technology (ICT) systems are vital for WFH [21–23]. Therefore, the availability of ICT systems is deemed to set the right conditions for this working modality [7, 24]. The ‘new generations’ of ICT applications have further heightened the expectations for a ‘revolution in the office’ [24]. While most of these applications have been in existence for a long time, the COVID-19 crisis has accelerated their employment and raised their perceived utility [25, 26]; consequently, their significant short- and long-term impacts can be expected on work [27].

The profitable adoption of WFH cannot always be taken for granted, while the availability of efficient and modern ICT applications is a prerequisite but not a firm guarantee of success [28, 29]. The individual perception of the usefulness, effectiveness, and user-friendliness of this working modality, which can also affect the efficacy of WFH for companies and societies, also counts [30].

The COVID-19 pandemic, with imposed lockdowns in several countries and the general situation of ‘forced’ WFH, offered an unrepeatable chance to analyze the perceptions of people’s experiences and the effect on their mental well-being. In particularly interesting conditions: workers were in comparable situations even in different countries, and they ‘had’ to work from home, so this working modality involved large numbers of people well beyond the ‘volunteers’ or ‘enthusiasts,’ and this unexpected situation provided a vast amount of data.

Within the coming years, WFH will likely become a new way of working as workers wish for more flexibility and the ability to choose where to work [7, 8, 31]. Consequently, governments and companies need a better understanding of the appropriate conditions to facilitate the adoption of this modality on a large scale across and between countries.

Being a unique situation, many studies have been conducted during and post-pandemic to gain insights into people’s experiences [6, 32–34]. The majority of COVID-19 studies have had a national focus and interest, describing the experiences of the pandemic in various jobs like in healthcare [35, 36] or services [37] or different functions such as nurses [38, 39], frontline personnel [40] or teachers [41]. However, few researchers have addressed the experiences of WFH between countries. As many workplaces are international with departments in different countries and the strong international call for increased flexibility and hybrid work, there is a need for studies that understand experiences across countries and not just focus on the countries individually. As information and communication technologies (ICT) enable WFH, it is essential to understand the abovementioned effects and the prerequisites.

According to recent statistics, Denmark and Italy are placed at two extremes regarding pre-COVID-19 WFH adoption [7, 32] and digitalisation levels according to the European Digital Economy and Society Index (DESI) [42]. The DESI summarises indicators of Europe’s digital performance and tracks the progress of EU countries [43].

A survey on working conditions and experiences of telework before the pandemic shows that the experiences vary across countries. While Italy recorded just 8% of workers doing telework/ICT-based mobile work before the pandemic, Denmark counted 36% of teleworkers [44]. Thus, with a high digitalization level and an experienced workforce in terms of telework and WFH, one would expect that Danish

workers experience WFH more positively than Italian workers do.

In light of the above, the purpose of this paper is to compare two countries, Italy and Denmark, with different pre-COVID-19 WFH conditions and experiences, focusing on the experiences of WFH in knowledge work from a psychosocial perspective, i.e., mental well-being. Our first aim is to identify key learnings, i.e., potentials and barriers of WFH, from two extreme cases and contribute to discussing digitalization strategies across Europe. Secondly, we want to explore whether prior experience with WFH, telework, or digitalization would be an advantage for workers where existing digital structures and tools were the only way to give continuity to work.

2. Background

The potential benefits of WFH have dominated the discussions of the new normal, post-Covid-19, in which advancement in digital technologies is a key focus. Despite the vast knowledge about technologies and digitalization, learnings from WFH during the COVID-19 pandemic should be considered cautiously. Therefore, this paper combines three topics: defining WFH, the role of technology in telework, and the potentials and barriers of WFH.

2.1. Defining working from home (WFH)

WFH can be defined as 'a working arrangement in which a worker fulfills the essential responsibilities of their job while remaining at home, using ICT' [31]. Indeed, different terms describe similar cases, such as 'telework.' Although there is no universal agreement [45], this term refers to working practices, such as 'homeworking,' 'remote working,' or 'smart working,' in which people work anywhere away from the 'usual' office through electronic connections [46]. This paper focuses on the restricted case of telework when workers are asked to or are offered the opportunity to work from home. However, although WFH differs slightly from telework (and related terms), literature that refers to either of them will generally be considered in the following sections.

2.2. Centrality of technology

Digital technology is at the core of WFH. It acts as a prerequisite and a pushing factor [47] and allows workers to be dispersed yet accomplish at

least some tasks effectively and efficiently [48] across time, geography, and culture [10, 49]. Accessing an adequate communication infrastructure and using effective ICT systems are considered vital for any form of telework [21]. There is often an emphasis on the spread of ICT access, which is deemed to set the right conditions for WFH where workers can 'positively accommodate the latest information technology environment without being constrained by time and place' [50]. The 'new generations' of ICT applications have further raised the expectations for a 'revolution in the office' [51].

The existence of a correlation between the availability of appropriate remote electronic communications and the likelihood of WFH adoption has long been emphasized [52]. The COVID-19 crisis and the keeping of social distance [25] gave further impetus to this idea. The pandemic emergency has shown that it is possible to work from home and ensure the continuity of the work. Therefore, efforts by governments to reduce technical or financial barriers to the exploitation of electronic communication have been welcomed. This 'technological determinism' is not new and has already been publicly questioned [52]. There is a risk of overestimating the beneficial effects of 'technology itself': Indeed, WFH is a revolution that requires a mix of supporting measures to be widely accepted in society; ICT must be not only available but also be user-friendly and fit the real needs of workers [53]. To sum up, digital technologies are essential for WFH and are of significant importance in digitalising Europe; however, like any other technology, it is essential to understand its effects on people and work.

2.3. Potential benefits, enabling factors, and barriers to WFH

Before the COVID-19 pandemic, several studies on the potential advantages, challenges, and barriers to WFH for individuals and organizations were conducted [10, 31]. WFH is expected to provide benefits for individuals, companies, and societies, such as reduction in costs for travel and office space, reduction in pollution and time wasted in commuting, more freedom to adjust the time of work with personal life, increased work flexibility, increased efficiency combined with the comfort of workers, less land consumption for offices [12]. The literature has also examined the factors influencing the successful adoption of WFH for both workers and firms. Hassan and Geleel argued that success depends on the nature of

the job, clearly defined goals and policies that fit the immediate needs of workers, and respect for their personal lives [54]. Kang and Kwon demonstrated that some facilitating factors are at the level of the individual, for example, the capability of people to self-organize their work; others are at the firm level, such as innovation climate, style of personnel evaluation, or characteristics of the information system [50].

The efficacy of WFH can depend on the way work is organized [55]. For instance, teamwork is possible in the WFH modality, but it can be challenging when too many team workers are at home [56]. Job position [57] and leadership style [58] also play a role. WFH can have an impact on socialization processes and personal work habits [59, 60]: it can change the forms of interaction between colleagues, which in turn can modify the processes of knowledge sharing and transfer [61], especially (but not only) for intellectual jobs [62].

The literature has also detected potential problems and implementation obstacles at the organizational and workers' levels, which can counterbalance the expected positive effects. While some studies highlighted increased flexibility and better work conditions [63], others have pointed to its complex implementation and negative impact [64]. Possible obstacles to successful implementation can also come from technical issues, e.g., the required investments in ICT or organizational aspects, including difficult coordination and cooperation among workers, complex management of knowledge transfer, fear of loss of control by top management, or anxiety related to work in isolation [65]. The impact on private life can be particularly critical [66]. WFH commonly provides a better trade-off between work and private life; however, it is sometimes associated with longer working hours and more significant intrusion of working issues into the private space. The recent COVID experience has exacerbated this risk of 'psychological stress' for workers who may feel 'stuck at work' even though they are at home [67]. Another stream of research regarding disadvantages of working from home concerns the lower level of physical activities and physical pain, e.g., in the back [68, 69]. A recent study provides insights into the six advantages and disadvantages of WFH during the pandemic across different countries and how these six factors can be interpreted as the 'common denominator' of peoples' experience of WFH. Where previous studies of telework listed the advantages and disadvantages in random order or focused on single items, Ipsen et

al. showed that the different experiences were inter-related and could be grouped into six main factors: (i) work-life balance, (ii) improved work efficiency, and (iii) greater work control. The main disadvantages were (iv) home office constraints, (v) work uncertainties, and (vi) inadequate tools [70].

Balancing the possible advantages and disadvantages of WFH, it is the perception of workers that may be, ultimately, central in their acceptance and, consequently, their success. This perception depends on how individuals see their working experience in combination with their expectations and private lifestyle and local regulatory, cultural, or social conditions [71]. Thus, to extend our knowledge about the factors that affect the diffusion of WFH, we need to investigate workers' perceptions during their WFH experience.

2.4. Cross-country comparisons of WFH perception

An interesting point that can provide insights into the possible mechanism of WFH and its success is whether it can detect different conditions in distinct national contexts and how these differences can lead to divergent perceptions. This issue has been addressed in the literature, but with some limitations; Higa et al. (1996) compared the US and Japan and found that workplace organization is a direct reflection of the cultural characteristics of countries, which also influences the pattern of adoption of telework. However, these data are more than two decades old and refer to a completely different context from the present [72]. Peters et al. used a broader sample of countries but focused on specific task controls in different cultures. Recently, Milasi et al. detected the differences between EU countries regarding the penetration of telework before COVID-19, while Sostero et al. also demonstrated the impact of COVID-19 from real-time questionnaire surveys [73]. They concluded that, in general, some jobs might be much more 'tele-workable' than others, substantially in all EU countries. Ollo-Lopez et al., Rubin et al., and van der Lippe and Lippényi analyzed data from several countries (pre-COVID) but did not focus on specific inter-country differences. Consequently, the limited number of cross-country studies and the international trait of work allowed and demanded by digital technologies call for studies that understand the importance of WFH across national differences.

2.5. WFH before COVID-19: differences between Italy and Denmark

Italy and Denmark, which are the targets of this study, are countries in two opposite situations regarding national ICT diffusion and WFH adoption. According to the last European working condition survey [44], the percentage of workers engaged in telework work varied. In particular, Denmark had 37% of teleworkers and was in the first position within the EU28, while Italy, with 7% of teleworkers, was in the last position. Eurostat confirmed these data in 2019 (Denmark had 28.5% and Italy had 4.7% of WFH workers aged 15 to 64 years). The two nations were placed in fifth and nineteenth places among EU countries (the average EU percentage was 16.1%). In both countries, the total percentage of ‘regular’ or ‘occasional’ WFH people was similar to 2010. According to Sostero et al., the industrial structure can explain these differences, especially the percentage of workers in knowledge and ICT-intensive services—exceeding 30% in Denmark and less than 25% in Italy. This offers only a partial explanation since the percentage of homeworkers in Italy in 2019—approximately 5%—was low compared to Denmark, which had more than 25%—even in those sectors. In conclusion, the lower diffusion of WFH in Italy compared to Denmark is a structural characteristic. This situation rapidly changed due to the COVID-19 lockdown: according to recent Eurofound statistics, individuals who worked only from home were 58.9% in Denmark and 53.3% in Italy.

Another element of difference is the level of digitalisation. According to the DESI [42], which summarises various features of the penetration and use of digital technologies in societies, this level was about 70 for Denmark (placing it in the third position among EU countries) and about 42 for Italy (placing it fourth to the last), just before the pandemic. This relevant divide was mainly due to Italy’s bad performance regarding human capital in ICT (last position) and the use of internet services (third to the last position). At the same time, Denmark stood out in connectivity (first position), use of internet service (fourth position), and digital public services (third position). Specifically, on a scale (zero to 100), Denmark scored better than Italy by more than 30 points regarding the integration of digital technology into businesses, by approximately 30 points in the use of internet services and human capital, by approximately 19 points in digital public services, and by approximately 15 points in connectivity. A final important aspect is work engage-

ment and its underlying factors. Recent surveys show that countries’ social contexts and habits can make a difference in WFH perceptions.

Based on the above, it is interesting to compare how workers of the two countries, which differed in their starting conditions, have evaluated their WFH experience during the first COVID-19 lockdown.

In summary, the presented literature provides the foundations of our study. First, it is argued that a punctual analysis of how workers perceive the usefulness and challenges of WFH in their cases is crucial to understanding the real prospects of this working modality. Second, the COVID-19 situation provides a unique opportunity for analysis. Due to the sudden changes imposed by the pandemic, many workers (even those that would not have volunteered for or spontaneously accepted WFH) were forced to adopt it; making it easier to single out specific perceptions of WFH beyond the restricted group of ‘enthusiastic adopters’ and providing insights into what can happen when this working modality is impelled. Third, the difference between Denmark and Italy in the starting conditions, especially regarding digitalisation, can help understand how much the availability of an easy-to-access ICT infrastructure can be a determinant for workers’ positive perceptions of WFH.

Previous telework research with international datasets rarely focused on specific inter-country differences or issues of analysis. In the COVID-19 context, few studies compare different strategies and impacts on workers, and little inter-country comparative research on perceptions of WFH workers during the COVID pandemic. Although digital platforms and tools allowed people across Europe to continue their work from home, little attention has focused on how digitalisation was perceived during the pandemic across countries. However, studying the experience during the pandemic can provide lessons for the future of WFH, even after the COVID-19 era.

3. Methods

A dominant topic during the pandemic was the future work, with an expectation that more people would work from home, as technology has shown. In this exploratory study, we investigated Danish and Italian workers’ perceptions of WFH during the first phase of the lockdown between March and May 2020, examining what distinguished Italian from Danish perceptions of WFH, the effect on mental well-being, and how this is connected to the degree of digitalisation of the countries.

3.1. Sample

The data source is an online questionnaire with 23 questions, including perceived advantages and disadvantages and the use of technologies to connect to colleagues [70]. To capture the immediate impact of COVID-19 lockdowns on people's lives and mental well-being, an online survey in Danish and Italian was published on social media platforms and disseminated via email from 21 March 2020. The survey included information on the study, the anonymity of the collected data, the future use of the data, and the respondents' right to delete their answers.

To approach respondents, we sent out the link to the survey via email to the researchers' industry and research networks in Denmark and Italy and social media channels, primarily LinkedIn. Data were thus collected using snowball sampling [74] because this exploratory study required rapid access to data during the COVID-19 lockdowns. Data collection in Denmark started on 21 March 2020 and in Italy on 24 March 2020 (shortly after the lockdown in both countries) and finished on 11 May 2020 when the countries slowly opened up again. The final dataset in this paper includes only workers; thus, managers and students were excluded, with 1771 responses from workers,

i.e., 723 responses from Italy and 1048 from Denmark.

At the time of data collection, most workers in the two countries were forced to work from home, and schools and kindergartens were closed. Table 1 gives a demographic overview of the study participants. Of Danish respondents, 67.9% were female, and 44.7% of Italian respondents were female. Most participants had a university degree in both countries (76.2% in Denmark and 64% in Italy). Before COVID-19, most Danish participants (83.8%) had already worked from home to some extent, while most Italian participants (70.7%) had never worked from home. The presence of children below 15 years of age at home was somewhat similar in the two groups.

3.2. Measures

We measured the advantages and disadvantages of working from home across the two countries based on the research results on the advantages and challenges of home-based telecommuting [49], on work or positive experiences [11] and disadvantages [29, 75, 76] of telework. The six factors for the perceived advantages and disadvantages of WFH are the following [70]: i) work-life balance, ii) improved work

Table 1
Demographic overview of study participants

	Denmark (N = 1048)		Italy (N = 723)	
Gender	Female	67.9%	Female	44.7%
	Male	30.8%	Male	54.4%
	Other/prefer not to say	1.1%	Other/prefer not to say	0.9%
Age	18-30	9.8%	18-30	13.3%
	31-40	21.8%	31-40	26.1%
	41-50	28.1%	41-50	33.9%
	51-60	30.2%	51-60	21.9%
	Above 60	9.6%	Above 60	4.6%
	Prefer not to say	0.5%	Prefer not to say	0.3%
Work from home before COVID-19 per week	Never	16.2%	Never	70.7%
	Less than 1 day	59.6%	Less than 1 day	8.0%
	1 day	16.4%	1 day	3.2%
	More than 1 day	8.2%	More than 1 day	18.1%
Work from home. under COVID-19	Only work from home.	93.1%	Only work from home	81.6%
	Sometimes work from home	6.9%	Sometimes work from home	18.4%
Young people and adults at home (including yourself).	1	30.3%	1	23.7%
	2	32.5%	2	26.4%
	3	15.5%	3	24.9%
	4 or more	20.2%	4 or more	24.2%
	not given	1.4%	Not given	0.8%
Children below 15 at home	0	62.0%	0	62.9%
	1	14.2%	1	19.2%
	2 or more	23.9%	2 or more	18.0%

486 efficiency, and iii) greater work control) and iv) home
 487 office constraints, v) work uncertainties, and vi) inad-
 488 equate tools. An overview of the factors and items is
 489 given in Supplementary Table 1.

490 The six factors were derived in an international
 491 study that investigates the experiences of working
 492 from home [70] using a principal component analysis,
 493 where three factors represented the main advantages
 494 and three factors the main disadvantages. The authors
 495 propose using the six factors for comparing the WFH
 496 situations of different groups, particularly countries
 497 with different prerequisites for WFH. The questions
 498 asked applied a 5-point Likert scale (1-*strongly dis-*
 499 *agree* to 5-*strongly agree*). The survey also included
 500 demographic questions and a few open-answer ques-
 501 tions for further information.

502 3.3. Analytical strategy

503 In the data analysis, we applied descriptive statis-
 504 tics to get an overview of the collected data. Cronbach's
 505 alpha was used for validating the scales for the six
 506 factors of advantages and disadvantages of WFH,
 507 and *t*-tests were used to compare Italian and
 508 Danish workers' perceived advantages and disadvan-
 509 tages of WFH. To analyze the differences between
 510 the two countries in-depth, we applied analysis of
 511 variance (ANOVA) to compare workers from Italy
 512 and Denmark regarding age and gender. These differ-
 513 ences were further explored using Cohen's *d*, and Eta
 514 squared for the effect size and the Scheffe Post-hoc
 515 test for significant differences between groups. We
 516 also analyzed the answers to open questions and pro-
 517 vided examples to explore our quantitative findings
 518 further.

519 4. Results

520 Both Danish and Italian participants used various
 521 tools to communicate and collaborate with their col-
 522 leagues, among them traditional means like telephone
 523 and email, and conference systems (Skype, Zoom)
 524 and groupware (MS Teams, Slack). Figure 1 pro-
 525 vides an overview of the percentage used for each tool
 526 category. There is no remarkable difference between
 527 the participants, except for text messaging (Danish
 528 workers preferred more SMS and fewer communica-
 529 tion apps like WhatsApp than Italians) and Facebook
 530 groups (used more extensively in Denmark).

531 The perception of life's situation under COVID-
 532 19, was more challenging for Danes (mean = 3.3130;
 533 SD = 1.03674) than for Italians (mean = 2.9571;
 534 SD = 1.02711) compared to before COVID-19
 535 (Fig. 2). A *t*-test showed a significant result ($t = 7.139$;
 536 $p = .000$) with lower effect size (Cohen's $d = .345$).

537 4.1. Advantages and disadvantages of working 538 from home

539 The perceptions of the previously mentioned
 540 advantages and disadvantages (see Supplementary
 541 Table 1 for detail) were calculated. Cronbach's alpha
 542 was evaluated for all the factors. The disadvantage
 543 factors have Cronbach's alpha values above 0.7,
 544 showing acceptable reliability. The advantage factors
 545 have Cronbach's alpha values between 0.5 and 0.7,
 546 which requires an improvement of these factors with
 547 modifications and additions in the future. Further-
 548 more, the mean values of all six factors for Denmark
 549 and Italy were compared. The *t*-Tests revealed signifi-
 550 cant differences between the two countries, as Italians

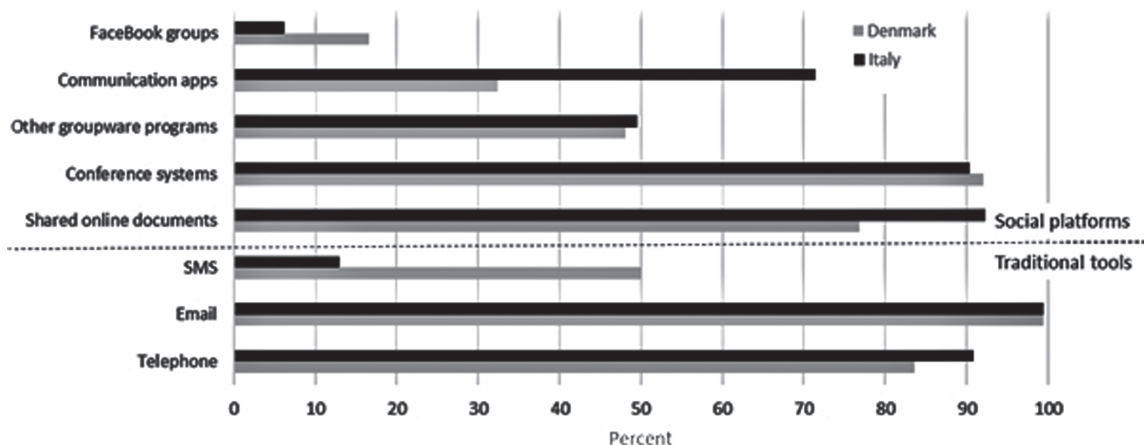


Fig. 1. Percentages of respondents who used a communication tool at least sometimes. Source: authors.

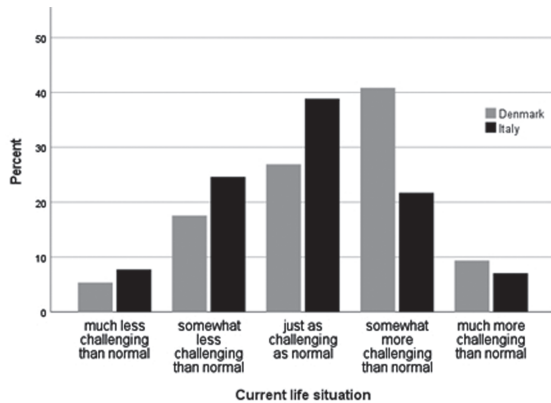


Fig. 2. Perception of the current life situation of Danish and Italian respondents Source: authors.

perceived higher advantages and lower disadvantages than Danes, which is consistent with their evaluation of their current life situation. According to Cohen's

d , the most significant difference is disadvantage one (Table 2).

4.2. Zooming in 'Home office constraints' and 'Work-life balance'

The most considerable differences were found among the advantages in AF1 (work-life balance) and the disadvantages in DF1 (home-office constraints); therefore, these factors were further investigated in more detail. Indeed, Danes scored lower than Italians did in all items concerning AF1 and higher in items concerning DF1 (Table 3). However, the most prominent effect, according to Cohen's d , are in 'I do not get to see my colleagues' and 'The physical conditions in my home do not afford a good working environment,' where the latter is further confirmed in Italians saying 'I like the atmosphere of my home' more than Danes. Therefore, Danes miss their colleagues and think that

Table 2
Mean and statistical tests for the three advantages and the three disadvantage factors

	Cronbach's alpha	Denmark Mean value (SD)	Italy Mean value (SD)	t -Value	p -Value	Cohen's d
AF1: Work-Life balance	0.632	3.184 (0.638)	3.511 (0.680)	-10.223	0.000	-0.500
AF2: Work efficiency	0.572	3.092 (0.857)	3.377 (0.857)	-6.888	0.000	-0.333
AF3: Work control	0.510	3.324 (0.748)	3.166 (0.743)	4.391	0.000	0.212
DF1: Home office constraints	0.767	3.323 (0.669)	2.502 (0.718)	24.332	0.000	1.192
DF2: Work uncertainties	0.759	2.127 (0.755)	1.733 (0.642)	11.820	0.000	0.555
DF3: Inadequate tools	0.727	2.596 (0.927)	2.329 (0.982)	5.740	0.000	0.280

Table 3
Mean and statistical tests for the AF1 and DF1 items

Factors	Items	Denmark Mean value (SD)	Italy Mean value (SD)	t -Value	p -Value	Cohen's d
AF1 Work-Life balance	I like the atmosphere in my home better	2.686 (.988)	3.192 (1.128)	-9.704	0.000	-0.481
	I save on the normal commute time	4.220 (1.015)	4.553 (.758)	-7.915	0.000	-0.363
	It is easier to get in contact with people.	2.586 (1.043)	2.607 (1.061)	-0.426	n.s.	-
	I break my old habits and change my routines.	3.331 (1.010)	3.603 (1.019)	-5.541	0.000	-0.268
DF1 Home office constraints	I can be close to my family and friends.	3.094 (1.255)	3.600 (1.136)	-8.839	0.000	-0.420
	I do not get to see my colleagues... as much.	4.235 (.887)	2.761 (1.224)	27.741	0.000	1.420
	I miss the food or other benefits.	2.499 (1.228)	1.582 (.881)	18.296	0.000	0.735
	I miss getting out of my home.	3.956 (1.085)	3.501 (1.334)	7.607	0.000	0.382
	I do not get enough exercise.	3.367 (1.318)	2.542 (1.316)	12.966	0.000	0.627
	The physical conditions in my home do not afford a good working environment.	3.669 (1.249)	2.246 (1.247)	23.584	0.000	1.140
	It requires more effort from me that I cannot use my normal routines.	2.878 (1.201)	2.401 (1.113)	8.579	0.000	0.409
	I feel tied to my computer.	3.245 (1.239)	2.895 (1.337)	5.584	0.000	0.274
I get disturbed by other people in my home.	2.739 (1.427)	2.086 (1.156)	10.602	0.000	0.493	

Table 4
Mean and statistical tests for the DF1 items by gender

Items in DF1	Denmark Female (<i>N</i> = 712) Mean value (SD)	Denmark Male (<i>N</i> = 323) Mean value (SD)	Italy Female (<i>N</i> = 323) Mean value (SD)	Italy Male (<i>N</i> = 393) Mean value (SD)	<i>F</i> -Value	<i>p</i> -Value	Eta Squared
I do not get to see my colleagues... as much..	4.303 (.889)	4.087 (.866)	2.765 (1.164)	2.761 (1.188)	289.018	0.000	0.332
I miss the food or other benefits	2.473 (1.237)	2.545 (1.203)	1.508 (.809)	1.651 (.936)	97.962	0.000	0.144
I miss getting out of my home	4.303 (.889)	4.086 (.866)	2.764 (1.264)	2.761 (1.188)	21.575	0.000	0.036
I do not get enough exercise	3.334 (1.362)	3.433 (1.211)	2.548 (1.212)	2.545 (1.309)	55.265	0.000	0.087
The physical conditions in my home do not afford a good working environment	3.764 (1.229)	3.461 (1.269)	2.415 (1.293)	2.112 (1.190)	193.201	0.000	0.249
It requires more effort from me that I cannot use my normal routines	2.876 (1.233)	2.898 (1.133)	2.464 (1.143)	2.361 (1.077)	23.979	0.000	0.040
I feel tied to my computer	3.301 (1.232)	3.112 (1.246)	2.879 (1.347)	2.921 (1.325)	11.633	0.000	0.020
I get disturbed by other people in my home	2.725 (1.459)	2.774 (1.356)	2.108 (1.194)	2.076 (1.125)	34.078	0.000	0.055

571 the physical conditions in their homes do not create a
572 positive working environment much more than Ital-
573 ians do. The effect size of items in AF1 are only on
574 the low and medium level. We repeated our analysis
575 for DF1 by categorising the workers by gender and
576 age.

577 4.3. Gender and home-office constraints (DF1)

578 ANOVA was used to investigate differences
579 between male and female Danes and Italians for all
580 items in DF1. All F-Tests showed significant results,
581 but only ‘I do not see my colleagues,’ ‘I miss the food
582 and other benefits,’ and ‘The physical conditions in
583 my home do not afford a good working environment’
584 had a significant effect size according to Eta squared
585 (Table 4).

586 A Scheffe Post-hoc test explored the differences
587 for these three items further. For item ‘I do not see
588 my colleagues,’ three groups were found: male and
589 female Italians can be grouped, with no significant
590 differences between the two genders, while male and
591 female Danes are in different groups—with female
592 Danish participants having the highest mean value
593 and therefore miss their colleagues the most. For item
594 ‘I miss the food or other benefits,’ two groups sig-
595 nificantly differ between the Italian and the Danish
596 groups (regardless of gender). Four significantly dif-

ferent groups were found for the third item (physical
conditions at home), with female Danes having the
highest mean value. The study shows that nationality
of residence has a higher weight than gender.

601 4.4. Age and home-office constraints (DF1)

602 The importance of age in the perception of DF1
603 was also explored. Participants were grouped into
604 ‘the younger’ (including millennials and generation
605 Z—with a maximum of 40 years of age) and ‘the older’
606 (generation X and baby boomers—over 40 years of
607 age). The assumption was that Millennials and Gen-
608 eration Z grew up with technologies like computers,
609 mobile devices, and social media, so an easier shift
610 to WFH using technologies might be expected. For
611 most items and in both countries, younger people had
612 a higher mean value than older people, except for ‘I
613 do not get enough physical exercise,’ where older
614 Italians complained more than the younger ones.
615 However, the mean values of Danish survey partic-
616 ipants were higher in all items than for the Italians.
617 The ANOVA analysis in Table 5 shows the statisti-
618 cally significant results, but only three items show
619 a large age effect according to the Eta squared analy-
620 sis. Using a Scheffe post-hoc test to investigate the
621 differences between the four groups in more detail,
622 two groups in all three items were found: Italians

Table 5
Mean and statistical tests for the DF1 items by age

Items in DF1	Denmark ≤ 40 years (N= 331) mean value (SD)	Denmark>40 (N= 712) mean value (SD)	Italy ≤ 40 (N= 285) mean value (SD)	Italy>40 years (N= 436) mean value (SD)	F-Value	p-Value	Eta squared
I do not get to see my colleagues . . . as much.	4.230 (.935)	4.240 (.862)	2.818 (1.257)	2.720 (1.200)	288.898	0.000	0.330
I miss the food or other benefits	2.619 (1.305)	2.448 (1.187)	1.597 (.954)	1.573 (.831)	101.523	0.000	0.148
I miss getting out of my home	4.082 (1.069)	3.899 (1.085)	3.565 (1.345)	3.452 (1.325)	23.565	0.000	0.039
I do not get enough exercise	3.526 (1.263)	3.2907 (1.33482)	2.2246 (1.25264)	2.7431 (1.31414)	68.764	0.000	0.105
The physical conditions in my home do not afford a good working environment.	3.737 (1.270)	3.645 (1.235)	2.256 (1.295)	2.239 (1.214)	187.053	0.000	0.242
It requires more effort from me that I cannot use my normal routines	3.042 (1.225)	2.806 (1.183)	2.267 (1.094)	2.493 (1.117)	29.326	0.000	0.048
I feel tied to my computer	3.245 (1.283)	3.246 (1.218)	2.912 (1.408)	2.890 (1.289)	10.446	0.000	0.017
I get disturbed by other people in my home	3.169 (1.518)	2.541 (1.341)	2.098 (1.203)	2.080 (1.127)	52.939	0.000	0.083

623 significantly differ from Danes—regardless of age.
624 Again, the study shows that nationality of residence
625 is more important than age.

626 4.5. Insights from open answers

627 The questionnaire also collected open-answer
628 comments about positive and negative experiences
629 with WFH during the first lockdown. Some Italians
630 declared that WFH can help focus more and that con-
631 tact with colleagues can be easily kept through video
632 conferences.

633 *‘It allows you to concentrate better and have a
634 better work-life balance. Remote communication
635 tools allow you to communicate with colleagues
636 as if you were in the office.’* (Male Italian ≤ 40
637 years old)

638 *‘An excellent experience. It allows me to concen-
639 trate more on activities and to waste less time; I
640 am still in contact with everyone’* (Female Ital-
641 ian >40 years old)

642 *‘I love the silence that helps me concentrate much
643 more on my work, compared to the chattering in
644 the office; and it is not so bad as relations with
645 colleagues, have even improved in some cases’*
646 (Female Italian ≤ 40 years old)

647 *‘There are no continuous distractions caused
648 by people going around in the open space, and
649 there is not that background noise that some-*

times becomes annoying and distracting’ (Female
Italian ≤ 40 years old)

652 Some respondents mentioned issues related to being
653 stuck at work at home and having childcare or family
654 members at home during work.

655 *‘It is difficult if you are not used to it. It requires
656 more discipline, and it is not easy with a small
657 child at home.’* (Female Dane ≤ 40 years old)

658 *‘Slowly, I created my spaces in a comfortable
659 way with the available tools in order to feel more
660 welcome to work inside a room; it seems triv-
661 ial, but the little things are very important (for
662 example, arranging the desk as at work, the other
663 spaces with books and small precious objects,
664 gifts, etc.).’* (Female Italian ≤ 40 years old)

665 *‘At the beginning, I had no issue, but I feel like the
666 more time I am locked at home, the less motivation
667 I have to be productive.’* (Male Dane ≤ 40 years)

668 Others signaled that WFH influenced the work-life
669 balance:

670 *‘I love being home with my family, but it is not sup-
671 porting an efficient working environment. I prefer
672 being in the office to work and being home to
673 relax.’* (Female Dane, 40 years old)

674 *‘I cook my lunch and eat better’* (Female
675 Italian ≤ 40 years old)

676 Furthermore, some respondents confirmed they
677 missed their colleagues, especially the incidental con-
678 tact that was not easily achievable in planned video
679 calls.

680 *'I miss the informal talks and surrounding things*
681 *with colleagues, which I now have to put into*
682 *writing.'* (Male Dane > 40 years old)

683 *'It is good to concentrate, but I miss contact with*
684 *colleagues and leaders. I miss a bit of motivation.*
685 *It is a bit lonely, but fortunately, my husband also*
686 *works at home.'* (Female Dane, 40 years old)

687 *'Concentration on work is even greater. On the*
688 *other hand, there is a lack of interpersonal rela-*
689 *tionships and sharing with colleagues.'* (Male
690 Italian > 40 years old)

691 Nevertheless, ICT tools helped to keep in contact and
692 work with colleagues.

693 *'Currently available tools make it possible to*
694 *perform much of the work and maintain human*
695 *relationships.'* (Male Italian > 40 years old)

696 *'By using Skype, I communicated and kept relat-*
697 *ing with colleagues as if I were in the office.'*
698 (Female Italian, 40 years old)

699 5. Discussion and conclusion

700 This study collected and compared data about
701 the experience of WFH during the early months
702 of lockdown in two countries with different levels
703 of familiarity with telework and digitalisation. This
704 study aimed to investigate the experiences of WFH
705 across two countries with different digitalization lev-
706 els and experiences of WFH prior to the Covid-19
707 pandemic. The study shows that across the two coun-
708 tries, digital tools allow for WFH but are perceived
709 differently.

710 5.1. Danes are more challenged during 711 COVID-19 than the Italians

712 The first topic addressed was the key learnings
713 and overall experience of WFH between Denmark
714 and Italy. The two countries show similarities and
715 differences. First, the respondents of both countries
716 declared that they had been working online (totally
717 or mostly) during the COVID-19 lockdown (Table 1).
718 This means that the biggest rise was for Italian work-
719 ers, who, according to the available statistics, were

720 partly accustomed to WFH and to a much lesser
721 extent than the Danes were. Though the two coun-
722 tries differed regarding their pre-COVID conditions,
723 the study indicates that workers found themselves in
724 a similar situation during the COVID-19 pandemic.

725 Although there was a marked difference in the pre-
726 COVID times regarding the availability of ICT tools,
727 Italian workers became accustomed to using tech-
728 nologies very quickly, with Denmark clearly at an
729 advantage. They did not signal particular problems
730 in their employment. Both national samples declared
731 that they used a rich mix of applications that allowed
732 accessible communication and collaboration while
733 WFH (Fig. 1). In some cases, the Italian group was
734 even more 'advanced' than the Danes (for example,
735 for text messaging, Danes used SMS more than Ital-
736 ians, who preferred communication apps).

737 A major distinction is in the perception of the
738 usefulness and convenience of WFH. The Danish
739 workers found WFH more challenging and demand-
740 ing than the usual pre-COVID work compared with
741 the Italians (Fig. 2). The detailed analysis of the
742 perceived advantages and disadvantages of WFH
743 (Table 2) shows that, while there is no statistically
744 significant difference with large effect sizes in the
745 perceived advantages, there is a significant distinction
746 with large effect size on the constraints of using the
747 home as an office. In particular, the Danes felt isolated
748 and frustrated by not having the chance to meet col-
749 leagues in person and did not appreciate the material
750 conditions of their home as an office. The survey par-
751 ticipants also responded consistently to their country
752 of residence, regardless of their age or gender.

753 The qualitative comments collected provide sub-
754 stantial confirmation of these results. Some Danish
755 respondents explicitly highlighted the lack of social
756 contact with colleagues. Conversely, some Italians
757 declared that the technology was enough to get in
758 contact with colleagues. The analysis shows that, for
759 the Danes, positive socialization with colleagues is an
760 essential factor in their work satisfaction and engage-
761 ment (as mentioned in section 2). Consequently,
762 forced WFH that does not allow a high level of social-
763 ization could be critical.

764 5.2. High digitalisation does not guarantee a 765 positive perception of WFH

766 A second goal was to examine whether prior expe-
767 rience with WFH, telework, or digitalisation would
768 be an advantage for workers where digital structures
769 and tools were the only way to give continuity to
769

work. Differences between the two countries show Danes taking advantage of their higher levels of digitalisation and familiarity with WFH technologies. Consequently, the ‘forced’ WFH condition caused by COVID-19 should have caused more trouble for Italians. However, despite their higher digitalisation (DESI) index and experience, the mental well-being among the Danes were more affected and they perceived WFH to be more challenging during COVID-19 than the Italians. This indicates that other factors may affect the perception and acceptance of WFH. In conclusion, adopting WFH may not be particularly challenging regarding the ‘technical’ changes in working modality, but it can impact personal behaviors and attitudes towards work and the balance between work and private life. The musculoskeletal strains [77] of WFH have not been in focus in this study but are recommendable in future studies.

5.3. Digitalisation and well-being

The analysis suggests that the availability of digital platforms and workers’ familiarity may be important but not enough to ensure a positive perception of WFH, which several factors may influence. A valuable lesson for public policymakers, governments, and corporate managers is that investing in the implementation of standard digital platforms and networks for WFH does not guarantee work satisfaction. To achieve the potential advantages for societies, the local needs of workers and the specific working habits should be considered, including non-business factors such as the social network and the web of peoples’ relationships.

5.3. Implications for policy makers

The vision of digitalising Europe builds on the idea that digital technologies can create better health, public health and competitive jobs. However, the analysis conducted in this paper shows an asymmetric effect between the EU Member States like Denmark and Italy. The increase in blurred boundaries between work and personal life due to the home-office constraints and the level of isolation is another pressing concern. Finally, it is surprising that digital capabilities are not straightforwardly positive regarding working conditions in countries with experience and digital capabilities.

This study draws attention to whether measures to facilitate WFH and reduce its negative impacts

on mental well-being can be effective. In particular, public investors and regulatory bodies at the national or supranational (e.g., EU) level should consider that simply providing efficient digital communication platforms may not automatically lead to easier adoption of WFH. For a positive acceptance of WFH, providing only technical support may not be enough. The local social and cultural conditions and how they act as enablers or inhibitors in the transition to digitalized work need to be addressed. The research shows that people’s attitudes and habits are essential and could be a discriminant factor in different social/national contexts.

In conclusion, an important message for public decision-makers is that access to technology may be a precondition for successful WFH, but simply investing more in communication platforms and networks is not enough. Widespread adoption of WFH may imply a profound change in social habits and personal lifestyles, and these aspects should not be neglected in the definition of appropriate policies to facilitate WFH. This requires a comprehensive discussion of job legislation and family-supporting policies. Issues such as leaving time for social contact and a right to disconnect should be considered to ensure people’s mental well-being.

5.4. Implications for management

The research also shows that the transition to WFH is not just ‘providing technology’ or ‘letting workers get accustomed to it’ for companies. To reap the benefits and achieve productivity from WFH, companies must recognize the mental well-being of workers and their positive perceptions of the benefits of this modality. Balancing worker well-being and productivity should therefore be considered in business policies.

While this study did not aim to derive managerial lessons, it still provides valuable insights for human resource management in companies willing to advance WFH for their workers. Again, ICT is a key prerequisite for enabling WFH, and its quality matters significantly for the efficiency of teleworking. However, the social part of work is important, at least for some social contexts, and it has a higher effect. Therefore, when companies discuss how to proceed post-COVID-19 and get requests for increased usage of WFH, managers should understand that simply offering the technology for WFH is not a guarantee of acceptance and adoption in all situations and social environments. The problem is even more complex for

868 multinational companies that manage international
869 teamwork and different workers' social cultures.
870 They should note that proper management of WFH
871 teams requires not a 'one-fits-all' solution; the pecu-
872 liar social conditions of the single national context
873 must be considered. Flexible and adaptive organiza-
874 tional solutions for work and job management are
875 crucial for ICT implementation. In continuation of
876 this, to be able to act in line with the change itself,
877 the organizations need to support the managers dur-
878 ing the transitions process to ensure that the managers
879 develop skills in tandem with the process, so they
880 match the new ways of working [78].

881 As our study shows, working from home can lead
882 to social and professional isolation, especially in the
883 Danish sample. It is thus essential to acknowledge the
884 social part of work and how it affects knowledge shar-
885 ing and peoples' motivation and mental well-being in
886 the hybrid work setting. Video conferencing systems
887 can help overcome the isolation. However, differ-
888 ent meeting types (e.g., for brainstorming, diving
889 work tasks, etc.) require different capabilities (hear
890 voices, share screens, see body language, experience
891 co-location) that influence how the meeting should
892 be conducted [79]. Virtual reality could be an alter-
893 native to video conferencing systems as it can create
894 a more realistic setting for spontaneous collaboration
895 and knowledge exchange. In the role of an avatar, a
896 person can walk around in the virtual office and meet
897 other avatars (colleagues) for knowledge exchange
898 [80].

899 Looking beyond the effect on peoples' mental
900 well-being when WFH, it is important to consider
901 the use of the generated behavioural data. While
902 workplace monitoring is a common practice when
903 WFH and thus can be expected to be a new way
904 to manage hybrid workplaces, the increase in gen-
905 erated data about people's behaviour comes with a
906 risk of increased remote control and surveillance
907 practices other forms of bureaucratic control [33].
908 Consequently, in a digitalising Europe, the new ways
909 of working may introduce considerations regarding
910 the ergonomic suitability of many home offices, the
911 psychosocial positive and negative effects, and digital
912 monitoring and insights into people's lives.

913 5.5. Limitations

914 A limitation of the study is that only two coun-
915 tries were considered because of their different
916 pre-COVID 19 conditions of WFH and its technol-
917 ogy. The data also has limitations: First, common

918 method bias could have influenced the results. For
919 future research, we suggest that longitudinal data
920 focusing on remote work issues should be collected.
921 Furthermore, objective data should supplement sur-
922 vey data in the study designs, which often rely on
923 self-reports only. Second, only the situation during
924 the COVID-19 lockdown was evaluated. Extend-
925 ing the analysis to a post-pandemic future situation
926 should be considered. Finally, a snowball sampling
927 method with its limitations was used. This approach
928 includes the risk of bias in the data. Consequently, the
929 generalization of the results only considers respon-
930 dents with similar personal characteristics.

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943 early in the COVID-19 pandemic.

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Supplementary material

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