

Working from home: Opportunities and risks for working conditions, leadership, and health

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Abstract – The current COVID-19 pandemic has led to a rapid increase in digital and virtual work, as well as new leadership challenges (remote work, working from home, web conferences, digital leadership etc.). It can be expected that these “new ways of working” will continue their influence on our working lives. This study is part of a larger research program “Digital Leadership and Health” which 1) investigates consequences of working from home (i.e., home-office) on commitment, engagement, and employee health, and 2) aims at identifying facilitating and obstructing design options for an effective and sustainable use of digital ways of working and takes leadership and health promotion into consideration. On this basis, 3) recommendations for an effective and sustainable use of digital working and leading will be derived (technical guidance, rules of conduct for leaders and employees, HR strategies). As a practical tool, a survey and feedback platform for leadership assistance will be developed. With this tool companies can easily evaluate their quality of digital work and leadership. In this paper the focus is on examining consequences of working from home on the basis of a survey with $N = 3652$ employees and leaders in Germany.

Keyword – Leadership, working from home, remote work, home-office, job satisfaction, commitment, health

I. INTRODUCTION

The Covid-19 crisis caused tremendous changes in the working context. To avoid getting infected and spreading the virus many employees had to work from home. For many employees, the work that used to be done in the office now takes place at home, i.e., in the home-office. Accordingly, working from home (WfH) increased significantly in most organizations [1]. WfH is supposed to bring both challenges and opportunities. Positive consequences are for example better opportunities to integrate family and work, less interruptions from colleagues and less commuting [2]. Negative consequences are reduced communication with colleagues, isolation and an inadequate home-office environment (e.g., no separate room for work activities, poor internet connection ...) [3].

Leaders experience a particularly strong transformation and challenges in their daily working life [4]. Previous literature has already suggested that leadership concepts from the traditional office setting cannot be simply transferred to the remote setting [5]. For example, leaders report an increase in working hours, additional administration and difficulties in keeping in touch with their followers [4]. Moreover, reduced contact and digital communication emerge as difficulties in motivating followers and in maintaining trust in their work ethics and engagement [6, 7].

While there is a first understanding of general challenges and demands for working and leading in the traditional office setting, the impact of WfH for leaders and employees is still unclear. For future work design and leadership, it is important to better understand the demands and resources that come along with WfH and how leaders may cope with challenges in this context.

Against this background, the current research project “Digital Leadership and Health” aims at deepening the understanding of opportunities and risks of working and leading in a digital context. Using a mixed methods approach, we conduct literature reviews, qualitative interview studies, longitudinal surveys, and laboratory experiments. The findings will be used to develop a survey and feedback platform to assist leaders when their teams are working from home. The project is part of the “Digitalization and Technology Research Center” of the Bundeswehr (dtec.bw).

The study and findings presented in this paper contribute to a better understanding of WfH by addressing three research questions on a quantitative empirical basis: a) what are consequences of WfH for working conditions in terms of resources and demands, b) what are the consequences of WfH for job satisfaction, engagement and health, and c) how can leadership be successful in the context of WfH (digital leadership)? To answer these questions, we conducted a comprehensive Germany wide, cross-industry survey, in which employees and leaders were asked about the differences between the traditional office setting and working from home, using a standardized set of instruments.

II. WORKING FROM HOME

Previous studies already suggest specific differences between the traditional office and WfH. For example, employees working from home experience greater flexibility, especially with regard to working hours, and also greater freedom of action [8–10]. These resources have a positive effect on employees' own job satisfaction, motivation, and performance and reduce their experience of stress [11, 12]. Working more smoothly with fewer interruptions can be more successful and can thus be an important resource [2, 13]. However, this depends on the circumstances at home. If the workplace has to be shared with the partner or children and/or relatives in need of care have to be looked after from home, this can quickly lead to more distractions and more frequent interruptions and a considerable double burden [14].

Traditional work environments provide a temporal and spatial framework that pre-structures and organizes employees' daily routines (e.g., fixed work and lunch breaks, spatial separation from private life). At home employees must manage without this structure [15]. It is not uncommon for breaks to be eliminated or shorter at home than in the office [16]. In order to compensate for this, a high level of self-management and organizational skills and a good sense of self-awareness are required [17].

Another major benefit of WfH can be seen as the saving of commuting time [2, 18]. However, it unfortunately often happens that the saved time is used for extra work instead of spending it for recreation [8]. Intensification of work and longer working hours is often observed [8, 10, 13, 16].

Workplace equipment is often an issue at home [16, 19]. Appropriate work furniture is often lacking (e.g., working from the sofa; working on the kitchen chair). Technical equipment is also often a problem (e.g., working with a laptop without an external keyboard and large screen). Whereas ergonomic chairs, large monitors, height-adjustable desks, and sufficient internet are usually provided in the office, employees are left to their own devices at home.

Traditional collaboration is also different when working from home. Communication mostly takes place via digital media, such as telephone, e-mails or web conferences. Digital collaboration can lead to more coordination problems [20]. Overall, it seems to be more difficult to receive new information and exchange information spontaneously [20]. Communication via digital media decreases the overall frequency of communication and interaction. Relationship building and informal communication are also perceived as reduced and more difficult [18]. Misunderstandings can also arise more easily, and conflicts can escalate more quickly or, in some cases, be discovered later [21].

On the one hand, web conferencing and digital communication facilitate communication and reduce the feeling of isolation. On the other hand, they can be a burden, especially if web conferencing is frequent, long, and without breaks [22] or if messages and calls lead to frequent interruptions. Since the Corona pandemic, daily web conferencing has increased dramatically [23]. Many workers complain of zoom fatigue due to frequent web conferencing and feel mentally and physically exhausted by web conferencing [22, 24].

As previous studies have shown, social interactions have an overall positive effect on stress experience and well-being [9, 12, 25]. At home, employees spend most of their time alone at their desk. This can lead to feeling isolated and hardly noticing what is going on with the other team members. The lack of social support from colleagues and the leader can pose a risk [13, 26] because social support from colleagues as well as from the leader is an essential resource. This may be limited due to limited contact and lack of physical proximity. Distance may also reduce mutual understanding and trust. It often happens that leaders assume a lower level of commitment and engagement when their team members work from home [27].

At home, the ability to reconcile family and personal obligations with work obligations is better, so that less conflict is experienced between personal and work life [18]. However, it also happens that more conflicts between private and professional life are perceived, especially if there are no separate and quiet rooms at home, and children or family members in need of care have to be looked after. Many employees experience a

blurring of boundaries between private life and work [13, 28]. On the one hand, WfH can be an opportunity for better work-life balance, but at the same time it can also lead to a risk of increasing conflicts between work and private life.

While there are numerous references in the literature to different opportunities and risks of WfH, little is known about the frequency and relationships of the respective aspects. This research gap is to be closed with a comprehensive Germany wide, cross-industry survey, in which employees and leaders were asked about the differences between the two settings using a standardized set of instruments.

III. METHOD

A. Sample and procedure

The study sample consisted of $N = 3.652$ German employees, including $N = 1.353$ leaders (37.7%) from a wide range of industries (metal and electrical industry, chemical and pharmaceutical industry, energy, construction, crafts, logistics, transport and traffic, tourism, hotels and restaurants, banking and insurance, real estate, corporate, legal, personnel and tax consulting, advertising, trade, security, IT and telecommunications, education, training and science, care, medicine and health as well as media, art and culture, and public administration). Participants were surveyed nationwide about their experiences when working from home in four waves (April 2021 - September 2022). Participants with different home-office intensities were included: from no day home-office (HO) (16.2%), 1 or 2 days (24.5%), 3 or 4 days (28.5%) to 5 days HO per week (31 %). 50.03% were male. A prerequisite for inclusion was that the participant's own work can basically be done in the HO.

B. Measures and Analysis

Established scales were used to measure working conditions [29–31], engagement [32]; commitment [33], health [34, 35]. All items were rated on a five-point answer format. Frequencies and correlation analysis were conducted. For easier readability we present “top two boxes”.

IV. RESULTS

In the following we present our findings with regard to three research questions: a) what are consequences of WfH for working conditions in terms of resources and demands, b) what are the consequences of WfH for satisfaction, engagement, and health, and c) how succeeds leadership when working from home (digital leadership)?

A. Consequences of WfH for working conditions

How do working conditions differ a) between those who work partly or mainly at home (HO) and those who do not, although this is possible in principle, and b) between the office and home-office work locations for employees who work in both locations?

A.1) Most working conditions are better with WfH - Voluntariness is crucial.

Respondents who work from home rate their overall **autonomy** and **scope of action** at work higher than respondents who only work in the office. For example, 67.5% of HO respondents say their work allows them to take initiative and act on their own discretion. Among employees working only in the office, the percentage is significantly lower at 54.8%. However, the voluntary nature of HO plays a decisive role: the

scope for action is perceived as higher (81.3%) when employees work voluntarily at home. Of those respondents who work involuntarily at home, only 48.7% experience a high level of scope for action.

With regard to **workload** (time pressure), there are hardly any differences between employees with and without HO. However, there is a difference in **permanent availability**. Those who work from home report higher requirements with regard to permanent availability outside regular working hours (26%) compared to those who work only in the office (13.9%).

WfH is also associated with frequent **web conferences**, which are often experienced as stressful. 17% of HO respondents report spending most of their day in web conferences, 16% report having no breaks between web conferences, and 23% are still working on other tasks in parallel (multitasking). For respondents working only in the office, the percentages are clearly lower at 4% (frequency), 6% (no breaks), and 12% (parallel work), respectively.

Frequent web conferencing increases the risk of **zoom fatigue**. Of those who spend most of the day in web conferences, 44.7% report that their eyes are strained (e.g., tired, dry, irritated; visual fatigue) and 42.1% that they "prefer to be alone and just have their rest" (social fatigue). In comparison, the percentages of those who never or hardly spend any time in web conferences are about 21% and 20.5%, respectively. Also, closely scheduled web conferencing also increases the risk of zoom fatigue. Of those who almost never have breaks between web conferences, 42.6% report that their eyes are strained (e.g., tired, dry, irritated; visual fatigue) and 46.3% that they "prefer to be alone and just have their rest" (social fatigue). In comparison, the percentages of those with adequate breaks between web conferences are only 19.5% and 19.6%, respectively.

Respondents in the HO who are more exposed to web conferencing experience more stress ($r = .27$) and discomfort ($r = .24$) and less job satisfaction ($r = -.15$). For respondents without HO, associations with stress ($r = .23$) and discomfort ($r = .16$) also emerge.

A.2) Direct comparison reveals advantages of WfH - but also risks.

In a direct within comparison, employees who work both in the office and from home assess the working conditions at the two workplaces differently. Their assessments regarding the office workplace hardly differ from the assessments of those who work exclusively in the office which confirms the validity of their assessments. Above all, **flexibility** is rated higher at home (71.0%, e.g., free time management) than in the office (54.2%). Again, the assessment is dependent on voluntariness: employees who voluntarily work from home rate their flexibility at home higher (83.9%) than individuals who perceive a low voluntariness (56.1%). In addition, respondents report fewer **interruptions** from others at home. At home, the percentage of employees who are adversely affected by interruptions is 18.6%. In contrast, when working in the office, the percentage is significantly higher at 37.4%.

Workplace conditions (ergonomics, sufficient space) are also rated worse at home. In the office, the proportion of positive assessments of workplace conditions is 71%, whereas it is only 47.1% at home. However, the assessment of workplace conditions at home is more positive if the respondents work voluntarily at home (53.4%) than if rather involuntarily (39.5%). When working predominantly or exclusively at

home, the proportion of positive evaluations of the workplace is higher (53%) than when only working one or two days at home (41.5%). Also, technical problems (e.g., problems with the internet connection) are more frequent at home (e.g., poor internet access 15.6% at home and 11.5% in the office). Accordingly, communication is more complicated and cumbersome at home (20.4%) than in the office (13.1%).

Moreover, employees experience more **isolation** at home. 32.9% of respondents say they feel isolated at home, but only 15.2% when they work in the office. Accordingly, 55.2% report missing direct contact with colleagues at home, whereas only 29.3% in the office. The home-office intensity is also noticeable here. When the HO intensity is high, 54.7% of respondents miss direct contact with colleagues. With a low intensity, it is "only" 48.1%. FIGURE 1 shows direct comparisons of working in the office and from home.

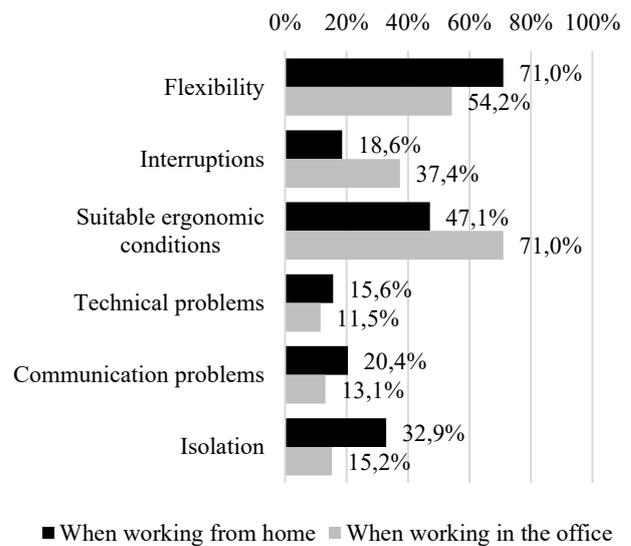


FIGURE 1: DIRECT COMPARISON BETWEEN OFFICE AND HOME-OFFICE.

A.3) Compatibility of family and career.

The **work-life balance** is also rated more positively by respondents who work in HO (69.2%) than without HO (62.7%). Here, the voluntary nature of HO also plays a decisive role: 78.1% perceived compatibility as better when they work voluntarily from home. Among those who work involuntarily at home, only 55.8% experience good compatibility.

It is often the case that employees in the home-office also take on additional care tasks during their working hours ("care work"). Here we distinguish between the care of children and the care of the elderly, people in need of care and people with disabilities. 36.3% of respondents with children who work at home provided intensive childcare. Only 25% of respondents with children have little or no care work at home.

Family environment plays a role in who benefits from working from home. Employees who live with children in a household benefit more from working at home. If employees live with children and can work at least partly from home, 26.1% report a high commitment compared to those who work exclusively in an office (16.7%). Thus, the proportion with high commitment is higher among those with home-office. Vice versa, the proportion of those with low commitment decreases from 48% without HO opportunities to 34.1% when

working from home is possible. If employees do not live with children, the place of work makes little difference to their commitment (20.3% have high commitment without HO versus 22.2% with HO). Similar effects are found for well-being showing that employees with children in particular tend to benefit more from WfH in terms of their commitment, engagement, and well-being than employees without children.

Furthermore, it became apparent that childcare was largely performed by women. For this purpose, we looked at children with higher care workloads in the age group up to 14 years. A high care effort in the HO was reported by 57.8% of the women but only 42.5% of the men surveyed. For women, caring for children while working at home also has a more negative impact on performance than for men. Of those with intensive childcare while working from home, 44.4% of men report high work performance, but only 32.6% of women.

B. Consequences of WfH for job satisfaction, engagement, and health

How do satisfaction, engagement, and health differ a) between those who partially or mostly work from home (HO) and those who are only in the office, and b) between employees with different extent of HO?

B.1) Do employees with WfH show higher commitment, satisfaction and engagement?

The ability to work at home is associated with significantly higher levels of **affective organizational commitment**. For example, 52.1% of respondents with HO say they feel a strong sense of belonging to their organization. For employees who only work in the office, the percentage is 43.8%, significantly lower. When it comes to the fit between individual values and the organization, the difference is even more pronounced: 53.7% of HO respondents say that their individual values fit with those of the organization, compared to only 41.2% of office-only respondents. When it comes to sense of belonging, it also comes down to voluntariness: While 61.1% of those respondents who are voluntarily working from home said they felt a sense of belonging to the organization, only 42.5% of those respondents who are involuntarily working from home did. Interestingly, commitment is not highest when working exclusively from home (49.8% with high commitment), but when the HO proportion is in the middle and low range (57.4% with high commitment).

The opportunity to work from home is also associated with somewhat higher **job satisfaction**. For example, 48.9% of respondents with HO report high job satisfaction. For employees who only work in the office, the percentage is slightly lower at 44.4%. Job satisfaction also depends on voluntariness: 58.8% of those respondents who work voluntarily in a home-office say they are satisfied with their work situation. In contrast, only 34.8% of respondents who involuntarily work at the HO are satisfied with their work situation. In contrast to commitment, job satisfaction is highest when the HO intensity is particularly high (52.2% with high satisfaction). When the HO proportion is small, 45.9% report high satisfaction.

The opportunity to work at home is related with a slightly higher level of **engagement**. For example, 37.4% of HO respondents say they are completely "absorbed in their work". Among employees who do not work from home, the percentage is slightly lower at 32.9%. Engagement also comes down to voluntariness, with 45% of respondents who voluntarily work from home reporting a high level of engagement compared to only 28.1% among those who are more involuntarily

at home. Interestingly, in contrast to commitment and job satisfaction, engagement is highest when the HO intensity is lower (44.0%) than when fully working at home (37.7%).

B.2) Do leaders and employees rate performance worse in the home-office?

In a direct comparison, leaders assess their employees' **performance** worse in the HO than in the office. In the office, 54% of leaders rate the work performance of their employees as very good to excellent and only 8% as sufficient to satisfactory. In the home-office, only 41% rate the work performance of their employees as very good to excellent but 15% as only sufficient to satisfactory.

A similar but somewhat weaker picture emerges for the employees' self-assessed work performance: their own performance is rated worse in the HO (50% very good to excellent and 15% sufficient to satisfactory) than in the office (53% very good to excellent and 10% sufficient to satisfactory).

B.3) Is WfH beneficial for health?

Employees with the opportunity to work at home report slightly better general **health**. 65.1% of respondents with HO report good general health (scores of 7 and higher on a scale of 0 - 10). Among employees only in the office, the percentage is slightly lower at 60.1%.

Employees who may work from home also report slightly fewer **mental stress** reactions in the past four weeks. Of them, 31.8% report headaches, tension, and back pain, 29.2% feel generally exhausted, and 18.4% feel irritable. Among employees who work only in the office, the proportions of those with mental stress reactions are slightly higher: 35.9% of them report headaches, tension, and back pain, while 33.1% report general exhaustion and 22.4% feel irritable.

B.4) Who benefits more, leaders or followers?

Overall, WfH is associated with higher job satisfaction and commitment, stronger engagement, and improved health. However, leaders and employees benefit slightly different. For example, the positive relationships between WfH and commitment and job satisfaction are more evident among employees ($r = .10, .09$), but not among leaders ($r = .01, .01$). Negative correlations even emerge among the group of leaders for health. WfH is even associated with a stronger experience of physical ($r = .07$) and psychological stress ($r = .05$) among leaders, whereas the opposite direction occurs for followers ($r = -.05, -.05$).

C. Risks and opportunities with digital leadership

How do leaders communicate with their employees? What is happening to informal communication? What is the significance of frequent web conferences? How much do leaders trust their employees in the HO? What form does digital leadership take? What difficulties do leaders experience?

C.1) Digital communication with leaders prevails at home.

Most respondents communicate with their leader 1 to 2 times per week (38%), 20% have contact only every few weeks or less frequently, 42% have more frequent exchanges, of which 22% communicate daily. **Daily communication** decreases with increasing HO intensity: if only in the office 36.1% have daily contact but with fulltime HO it is only 14.5%. Communication frequency with the leader has a positive effect on health, satisfaction, and performance: e.g., on engagement ($r = .15$), commitment ($r = .21$), health ($r = .15$).

Overall, 46% of the respondents communicated predominantly or exclusively digitally with their leaders while only 27% had predominantly direct **face-to-face** contact. As expected, the face-to-face communication decreases with increasing HO intensity ($r = -.66$). Among those who work in the office only, the face-to-face communication is 61.3% and the digital communication part is only 23.4%. In contrast, for those who work primarily from home (4 or 5 days), the face-to-face share is only 5% and the digital share is 85%. Remarkable, the more face-to-face communication, the more **informal communication** takes place ($r = -.15$).

C.2) Informal communication with leader suffers at home

In a direct comparison, respondents rate informal communication with their leaders in the HO worse than in the office. For example, only 29.3% of respondents state that their leader in the HO "takes time to talk spontaneously about private matters in between" or 28.7% state that the leader shows private interest "... and often asks what is going on". In the office, the proportion is significantly higher at 48.5% and 39.1%, respectively.

Although on a higher level, as is also the case with the other leadership behaviours, the leaders confirm this picture. For example, 49.4% of leaders state that they "take time to talk spontaneously about private matters in between" and 50.6% state that they are "interested in their employees as a private person and often ask what is going on" in the HO. In the office, the percentages are significantly higher: 75.9% and 68.4%, respectively.

Overall, the possibility of developing and maintaining informal contacts between employees and leaders is significantly more limited in the HO than in the office, both from the perspective of the employees and the leaders. From the followers' perspective, more informal communication in the HO is related to less stress ($r = -.16$), more well-being ($r = .22$), commitment ($r = .34$), engagement ($r = .35$), job satisfaction ($r = .32$), and performance ($r = .17$).

C.3) More face-to-face communication after pandemic

Leaders and followers alike assume that their communication behavior will change after the pandemic. During the pandemic, 56.8% of employees primarily communicated online and only 21.4% face-to-face. This is similar for leaders (primarily 59.3% digital to 23.2% face-to-face). After the pandemic, the picture reverses: 49.5% of followers expect to communicate predominantly face-to-face and only 20.8% predominantly online. This is similar for leaders (41.3% face-to-face and only 26.6% digital).

Regarding digital communication, synchronous forms (video, telephone) will prevail after the pandemic. This is more pronounced by leaders (44.9% for synchronous communication versus 14.4% for asynchronous communication) than by followers (38.3% versus 21.0%).

C.4) Leaders use online tools for digital leadership

Leaders who also work from home try to support digital collaboration with **digital online tools for conferencing, project management, and informal encounter**. According to their own assessment, 48% work with communication routines such as a joint online meeting at the start of the day or week, e.g., with WebEx, Zoom, MS Teams, and 45% also use digital project management tools to ensure transparency with regard to the tasks and responsibilities of all team or project members (e.g., Jira, Confluence, Asana, Kanban, Trello, MS Planner).

From the follower perspective, the percentage is lower at 36% and 25%, respectively.

The promotion of informal contacts and communication is an important issue in digital work. According to their own assessment, 46% leaders promote informal encounters between themselves and employees through virtual afterwork parties, shared lunches or coffee breaks, e.g., with Gathertown. Again, from the employees' perspective, the percentage is lower at 28%. Many leaders (45%) also try to promote direct face-to-face contact under pandemic conditions, e.g., newly formed teams or project groups. From the employees' perspective, the percentage is lower at 27%.

Overall, around 45% of the leaders say they support digital collaboration through various measures and the use of digital tools. Only about 20% do not use any tools or do not explicitly support informal communication. From the perspective of employees, the proportion of leaders who say they support digital collaboration through various measures and the use of digital tools is lower at around 30%. Conversely, around 45% state that their leaders tend not to take any measures.

C.5) Digital leadership pays off

When leaders engage in digital leadership by fostering communication and using digital tools, this has a variety of positive effects for followers and leaders themselves. Employees whose leaders engage in digital leadership experience less stress ($r = -.17$), more engagement ($r = .44$), more commitment ($r = .47$), better health ($r = .21$), higher job satisfaction ($r = .35$), and better performance in the HO ($r = .16$) but also in the office ($r = .22$).

Leaders who engage in digital leadership themselves experience less stress ($r = -.17$), more engagement ($r = .30$), more commitment ($r = .29$), better health ($r = .25$), and report a better performance of their employees in the HO ($r = .20$) but also in the office ($r = .21$). It is possible that they benefit themselves by leading more effectively and efficiently. However, it is also conceivable that leaders who are less stressed and more motivated are more likely to engage in digital leadership.

Employees whose leaders engage in digital leadership also experience better informal contact when working from home ($r = .47$). This is also supported from the perspective of the leaders ($r = .34$).

C.6) Specific challenges for digital leadership

To further identify specific challenges for digital leadership, leaders were asked to directly compare both settings. They report specific problems in the areas of management, control, support, and coordination in the team, in comparison to leadership in the traditional day-to-day office environment.

Above all, 46% leaders find it difficult to **notice when someone needs support** when working from home. In the office, only 22% report this difficulty. It is also more difficult to **recognize employees' current workload** and to see how much employees are actually working. This is experienced as difficult by 42% at home, while this is seen as critical by only 22% in the office. It is challenging to find out whether the team members **coordinate** well with each other. This is experienced as difficult by 41% when working from home, while this is seen as critical by only 20% in the office. 38% report that **spontaneous communication** is difficult (21% in the office) and 36% find it difficult to **learn about problems** in a timely manner (19% in the office) or to find out whether employees

have **understood the tasks** correctly (33% in the HO compared to 19% in the office). Furthermore, 24.7% of the leaders report that in the HO it is "difficult to really understand the respective points of view in case of **problems/conflicts** in the team (17.4% in the office). Similarly, when problems/conflicts arise, it is difficult to find solutions with which everyone is satisfied (24.8% in the HO vs. 16.2% in the office).

Although leaders rate their employees' work performance worse in a direct comparison in the HO than in the office, they largely **trust** their employees. For example, 64.6% of leaders with HO state that they "trust their employees to be fully committed to their work even in the home-office and not to exploit the home-office for private purposes". This impression is confirmed by employees (63.6%). However, only 42.0% of employees experience concrete health-promoting support by their leaders in the home-office: "considers environmental conditions in the home-office (technical, family, spatial, etc.)" and "supports that the employees in the home-office have appropriate technical and ergonomic equipment" (37.4%). Even a smaller percentage reports that their leader "notifies and reacts when they are not feeling well in the home-office and are tired and fatigued (17.4%) or encourages them to "compensate for this in the home-office by exercising" (22.4%) or to "ensure sufficient healthy nutrition" (18.1%). Comparing the employees' assessments of health-promoting support with the leaders' self-assessment reveals a clear discrepancy: about 50% of the leaders believe that they provide health promotion.

Employees whose leaders offer health-promoting support in the home-office also experience a better informal contact in the HO ($r = .61$), take more care of their own health themselves (SelfCare; $r = .34$). They report fewer health complaints ($r = -.18$), less stress ($r = -.21$), feel better ($r = .32$), are healthier ($r = .24$) and more engaged ($r = .47$), feel more connected to the company ($r = .46$), are more satisfied with their work ($r = .36$).

V. DISCUSSION

On the one side, the results from our survey show that working from home offers opportunities for many employees, in terms of higher autonomy and flexibility, less interruptions and better work-life-balance. Overall, there are positive consequences for commitment, job satisfaction, engagement, and health. There are also boundary conditions and third variables that may strengthen or weaken the effects, e.g., stronger with voluntariness or weaker for leaders.

On the other side, our findings reveal several risks that should be acknowledged. Among these risks are poorer workplace equipment and technical problems, higher expectations for permanent availability outside working hours, exhausting web conferences with zoom fatigue and isolation. In particular, informal contact and communication is reduced with digital communication. For leaders we identified specific challenges. Most of them result from communication limitations when working from home. For example, leaders find it difficult to recognize critical signs of work overload and conflicts, to assess performance, and to support health.

Employees, leaders, and organizations should be aware of these potential opportunities and risks. Knowledge and awareness are important preconditions to foster resources and to reduce specific risks at all levels. For example, the preference of synchronous rather than asynchronous communication, ensuring regular informal communication, consideration of employees' living conditions at home, the benefit of rules of conduct for availability, avoidance of multitasking during web

conferences, or the systematic use of online tools that facilitate communication and cooperation are already helpful strategies to cope with the challenges of digital work and leadership [36].

Nevertheless, further research to improve digital work and leadership is needed. Longitudinal analyses may clarify development over longer periods of time and allow for causal inferences. Experimental studies can isolate single effects of specific settings (e.g., face-to-face vs. online) or online tools (phone vs. video vs. VR) on specific outcomes (health, performance etc.) and also better control for alternative explanations.

From a practical perspective, innovative tools may facilitate digital leadership. Drawing upon the current findings, the authors develop an online platform that can be used simultaneously as a learning tool and as a feedback tool. Both functions may be supportive for an effective and healthy work in a digital setting at home. The learning function fills the gap of lacking information on typical risks and opportunities and provides recommendations for a proper handling for leaders and followers. The feedback function reflects on the limited communication possibilities and will offer devices for systematic and spontaneous feedback. Monitoring the team status over longer periods of time may help acting before things go wrong.

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