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Work engagement and its antecedents in remote work: A person-centered view

Anne Mäkikangas^a, Soile Juutinen^a, Jaana-Piia Mäkinen^b, Kirsi Sjöblom^a and Atte Oksanen^a

^aFaculty of Social Sciences, Work Research Centre, Tampere University, Tampere, Finland; ^bThe Finnish Institute of Occupational Health, Helsinki, Finland

ABSTRACT

The aim of this study was to investigate characteristics associated with employees' ability to cope with the challenges of remote working as flexible work arrangements are predicted to constitute an increasingly pervasive model of work. More specifically, we investigated job resources specific to remote work and employees' strengths and behaviours that may be crucial for enhancing work engagement when working outside a traditional office environment. The present study adopted a person-centered approach to investigate work engagement and its antecedents. A sample of 455 employees completed a questionnaire four times across a ten-month period during the enforced remote work occasioned in response to the corona pandemic. The results revealed four distinct work engagement profiles. Most employees (75%) belong to profiles with either average or high levels of work engagement, which remained stable after a slight initial increase. A decrease was observed in 25% of those employees whose work engagement was already low at the study baseline. High levels of organisational support, the functionality of home as a work environment, job-related self-efficacy, and job crafting characterised the profile in which work engagement remained at a high level during the remote work. Implications for practice concerning well-being protective multi-locational work are presented.

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Remote work; work engagement; job resources; job-related self-efficacy; job crafting; latent profile analysis

Introduction

Since 2020, the COVID-19 pandemic has radically altered the temporal and spatial dimensions of work throughout the world. A large number of employees have worked from home or other remote locations enabled by digital technologies (Eurofound, 2020). The amount of multi-locational work had slowly risen prior to COVID-19 (Reuschke & Felstead, 2020) and the global pandemic has accelerated this development. Due to the long-lasting period of remote work, many employees and organisations have been able to appreciate its benefits. Consequently, multi-locational work is predicted to

CONTACT Anne Mäkikangas  anne.makikangas@tuni.fi

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present an increasingly pervasive model of work in the postpandemic era (see e.g. Shifrin & Michel, 2022), and there is an urgent need to better understand what factors contribute to flexible work arrangements promoting well-being. Our aim is therefore to investigate, through data collected during enforced remote work occasioned by the pandemic, job resources specific to remote work as well as personal strengths and behaviours that can be argued to be crucial for maintaining work engagement when working outside a traditional office environment.

The present study contributes to the existing remote work literature in several ways. *First*, we focus on specific job resources that include features of both the homeworking environment and its functionality, as well as on organizational level resources (i.e. support) aimed specifically at remote work previously identified as an important determinant of low distress among remote workers (Mäkinen et al., 2021). The majority of the remote work literature so far has focused on general job characteristics, such as autonomy and social support from colleagues (for a review, see Charalampous et al., 2019), but in order to comprehensively understand remote work, its specific characteristics need to be investigated. *Second*, we focus on employees' personal resources and proactive behaviours that may be needed to cope with the challenges of remote work as well as to design efficient and balanced ways of remote working, namely job-related self-efficacy (Schwarzer & Jerusalem, 1995) and optimising job demands through job crafting (Demerouti & Peeters, 2018). Our *third* contribution relies on understanding positive, motivating, and productive remote work experiences, and we, therefore, focus on work engagement (Schaufeli et al., 2002). Work engagement has been a somewhat neglected employee state in the remote work literature (see Charalampous et al., 2019), as the work engagement research has mostly been conducted among those not working remotely (for a review, see Lesener et al., 2020). We further consider the possible variation in longitudinal remote work engagement experiences, an issue that has not so far been investigated in the literature. The person-centered approach adopted here has the potential to enrich our antecedent investigation as it enables us to study the importance of antecedents in each identified profile. This study provides practical knowledge for both organisations and managers, as well as for employees, about how to manage new ways of working most effectively and in ways which are conducive to well-being.

Work engagement in remote work

Working outside the office at differing locations has been referred to by several names, such as “telework”, “remote work”, “eWork”, “virtual work”, and “remote e-working” (see Charalampous et al., 2019; Vartiainen & Hyrkkänen, 2010). So-called “hybrid work” was originally introduced by Halford (2005) to refer to a combination of organisational and domestic workspace. Later, hybrid work was expanded to include workspaces other than the office and home (Hislop & Axtell, 2009). Moreover, concepts such as “virtual mobility” and “mobile, multi-locational work” emphasise working via technology from different locations (e.g. main office, home, secondary and third offices besides moving workplaces) (Vartiainen & Hyrkkänen, 2010). In the present study, we will use the umbrella term “remote work” as it captures the features of work arrangements during the COVID-19 pandemic which were mainly home-based and virtual due to lockdown and restrictions.

The well-being of remote workers has attracted increasing research interest especially due to earlier contradictory findings (for an overview, see Boell et al., 2016). That is, remote work, and especially working from home, has been found to exacerbate work-life conflict (Golden et al., 2006) and the extent of remote work has been positively linked with greater exhaustion and lower work engagement (Sardeshmukh et al., 2012). On the other hand, remote work has contributed to greater job satisfaction (Wheatley, 2017), lower stress, lower work-home conflict, higher work engagement, and higher job performance (Delanoeije & Verbruggen, 2020). We focus here on *work engagement* during remote work, which refers to a positive motivational and emotional state characterised by vigour, dedication, and absorption (Schaufeli et al., 2002). Work engagement has so far been understudied among remote workers, whereas job satisfaction is the most investigated positive employee experience in remote work (for a review, see Charalampous et al., 2019). However, work engagement can be argued to present a more desirable condition in remote work than job satisfaction, as it connotes with energy and focused effort and facilitates performance and commitment to work (for reviews, see Bailey et al., 2017; Halbesleben, 2010).

Our focus here is on the *longitudinal development* of work engagement during remote work. Focusing on sustained and possibly fluctuating levels of work engagement is extremely relevant as it produces knowledge on whether employees are able to maintain their energy, commitment, and concentration during ongoing remote work. On the other hand, this is also empirically a somewhat scantily researched topic: Charalampous and colleagues (2019) were able to identify only two longitudinal studies from altogether 63 reviewed studies focusing on the well-being of remote workers, both of which were case studies.

Work engagement has been theorised to represent a fairly stable, job-related well-being condition (Schaufeli et al., 2002), the level of which is primarily determined by job-related factors but also by the resources available to the employee (Bakker & Demerouti, 2017). Although day-to-day variation in work engagement has been evident in diary designs (see e.g. Kühnel et al., 2012), studies have identified a considerable stability over time in its levels (for a review, see Mäkikangas et al., 2016). However, these results, obtained under so-called normal working conditions, reveal little about possible changes in work engagement in a decidedly different work situation, such as the enforced remote work studied in here. Published studies conducted in the pandemic era provide evidence that since the beginning of remote work, levels of work engagement have declined. For example, in a study conducted in a Dutch multinational organisation from January to May 2020, the levels of work engagement decreased markedly in March and thereafter (Syrek et al., 2022). Moreover, a four-wave study conducted in 2019 and 2020 among a representative sample of Finnish employees revealed decreasing levels of work engagement during the fall 2020 at the height of the COVID-19 crisis (Oksa et al., 2021).

It is possible that individual employees' work engagement levels and changes in these during remote work vary, an issue that has not been previously investigated. Moreover, it is also plausible that the experiences of remote work lasting almost a year are different than at the beginning of enforced remote work. Therefore, in this study work engagement is studied at a total of four-time points between April 2020 and February 2021 in order to achieve a longer time perspective on remote work. We adopted a person-

centered approach (Hofmans et al., 2020) which enabled us to identify possible differing work engagement experiences and changes therein over time. It is plausible that among some employees work engagement may have decreased at some point of the pandemic (Oksa et al., 2021; Syrek et al., 2022), but an opposite development may also be possible because due, for example, to increased autonomy (Syrek et al., 2022) and the opportunity to concentrate on individual tasks due to the absence of office distractions and commuting (Kelliher & Anderson, 2010). It is also possible that enforced remote work has not affected employees work engagement, which thus remains stable. Bearing in mind that person-centered analysis is a data-driven method, and as in this case there is no prior empirical evidence to rely on to predict the level and shape of latent work engagement profiles, our first hypothesis is:

Hypothesis 1. During the ten-month remote working period, different levels and change profiles in work engagement can be identified.

Job resources and employee strengths and behaviours specific to remote work

According to the Job Demands-Resources theory (JD-R), the predictors of work engagement are rooted in the psychosocial job resources, personal resources, and behaviours which modify job demands and resources through job crafting (Bakker & Demerouti, 2017). In the JD-R theory, job resources are assumed to lead to positive employee outcomes such as work engagement as they facilitate work motivation and help to cope with high job demands. Moreover, job crafting is argued to balance the job demands-resources relation, which is conducive to job-related well-being, such as work engagement (Bakker & Demerouti, 2017). Personality resources, which are generally defined as malleable positive beliefs about oneself and the world (Van den Heuvel et al., 2010), are known to be related to more positive appraisals of the work environment and utilization of job resources, thereby facilitating the achievement of goals and helping to cope with demanding situations (Bakker & Demerouti, 2017). Several personal resources, including self-efficacy, as studied here, have been found to improve work engagement (for a review, see Mäkikangas et al., 2013).

The JD-R theory (Bakker & Demerouti, 2017) was applied here to understand the motivational process of work engagement during remote work. In this study, the antecedents of remote work engagement are sought first from *organisational support* for remote work, that is, effective management of remote work and the support, guidance, and information provided by the organisation for remote employees. In addition, we focus on features of remote work environment, namely the *functionality of home as a work environment*, as the majority of employees worked from home during the pandemic. Antecedents of work engagement were also sought from personal resources and proactive behaviours – *job-related self-efficacy* and *job crafting* – both of which are known to be significant explainers of work engagement under normal work conditions (see reviews and meta-analyses, Lichtenthaler & Fischbach, 2019; Mäkikangas et al., 2013; Rudolph et al., 2017).

The support provided by the organisation plays a key role in promoting and sustaining job-related well-being during remote work (Mihalance & Mihalance, 2022). Based on the existing pre-COVID literature, organisational support is known to facilitate affective commitment and job involvement (for a review, see Rhoades & Eisenberger, 2002) as

well as work engagement (Kinnunen et al., 2008) among employees. It has been demonstrated that the extent to which the remote work necessitated by the corona crisis affected employees depended heavily on how organisations responded to the situation (Mihalance & Mihalance, 2022). Remote task support particularly, for instance, technical support for working remotely and instruction for learning new technologies are needed, as are help with setting up home working facilities together with timely information and open communication – these can be listed among the key indicators of organisational task support facilitating employee well-being and commitment (Chong et al., 2020; Mihalance & Mihalance, 2022; Nayani et al., 2018; Richter, 2020). During the coronavirus pandemic, organisational support has been shown to be linked to lower levels of the opposite state of work engagement, namely emotional exhaustion, among service industry employees (Chen & Eyoun, 2021) and university employees working remotely (Mäkinen et al., 2021). We focus here on the guidance and support provided by the organisation related to remote work task support in general and to the technical support much needed in remote work, and hypothesise that:

Hypothesis 2: High level of organisational support increases the likelihood of belonging to profiles where work engagement is at a high level or increases during follow-up.

We also investigate the functionality of home as a work environment as a potential antecedent of work engagement. Working from home may pose some new challenges for employees, as there may be a lack of sufficient workspace, boundary management between work and leisure time may be difficult, and ergonomics may also be challenging as home offices may not be as well-equipped as workspaces in offices. The absence of ergonomic office furniture at home and poor physical ergonomics have been shown to cause different musculoskeletal disorders (e.g. neck and lower back pain) in remote work (Moretti et al., 2020). There is also some recent evidence that the physical environment measured among others via ergonomics, layout, privacy, temperature, and air quality, is linked to higher work engagement (Duque et al., 2020). In the present study, we study the role of the functionality of home as a work environment taking into account the availability of quiet working space, suitable equipment for virtual remote work, ergonomics, and work-life balance, and hypothesise that:

Hypothesis 3: High functionality of home as a work environment increases the likelihood of belonging to profiles where work engagement is at a high level or increases during follow-up.

As a personality resource construct, we focus on self-efficacy, referring to a belief in one's general capacity to handle and complete tasks and attain goals (Bandura, 1986, 1997). Self-efficacy refers to the stress-resistant disposition of an employee (Mäkikangas et al., 2013), and is especially important in coping with failures and difficulties and helping to face challenging situations (Bandura, 1986, 1997), such as enforced remote work caused by the corona crisis. Self-efficacy has been shown to be an important factor for adjusting to remote work and is linked to the structural behaviours needed in remote work, namely proactive planning, prioritizing, and organizing one's work (Raghuram et al., 2003). Moreover, self-efficacy has been constantly linked to higher job-related well-being, such as lower levels of burnout and higher levels of work engagement (for reviews, see Mäkikangas et al., 2013; Shoji et al., 2016). In addition, a positive relationship with work-related performance has been reported (for a meta-analysis, see

Stajkovic & Luthans, 1998). During the COVID-19 pandemic, self-efficacy has been shown to be associated with better mental health (Yıldırım & Güler, 2022) and more positive affect and adaptive performance at work (Joie-La Marle et al., 2021).

Here we investigate job-related self-efficacy referring to individuals' confidence that they have the necessary skills to accomplish job-specific tasks and cope with occupational challenges (see Rigotti et al., 2008). Overall, the self-efficacy literature so far suggests that domain-specific efficacy beliefs predict behaviours and achievements in a certain context better than global expectations (see Pajares, 1997). Moreover, focusing on job-specific personal resources enables us to capture context-specific facilitators of work engagement thereby also offering more efficient practical implications. Therefore, in this study, we investigate the role of job-related self-efficacy beliefs for work engagement during remote work, assuming that:

Hypothesis 4: High level of job-related self-efficacy increases the likelihood of belonging to profiles where work engagement is at a high level or increases during follow-up.

Job crafting refers to proactive behaviour by employees that is crucial to manage work-life challenges (Tims et al., 2012; Wrzesniewski & Dutton, 2001). According to the JD-R theory (Bakker & Demerouti, 2017), job crafting refers to the proactive employee-initiated tailoring of one's job demands and resources, enabling employees to better adjust to their work environment. It is possible to craft a job in many different ways (see Zhang & Parker, 2019), but in this study, we focus on a relatively novel job crafting strategy that we believe to be of particular importance in remote work, namely optimising job demands (Demerouti & Peeters, 2018). Optimising demands refers to improving work processes or simplifying them in order to accomplish work more efficiently, for example by finding new ways of working (Demerouti & Peeters, 2018). It is plausible that this job crafting strategy is much needed in remote work, where the methods and tools used to handle daily tasks and projects depend on the employee's own way of working. It is likely that those employees who have succeeded in developing new ways of working suitable for their work situations have been able to maintain their work engagement better than others.

Optimising job demands belongs to the so-called approach-type job crafting strategies (Zhang & Parker, 2019), which are generally known to promote work engagement (see reviews by Lichtenthaler & Fischbach, 2019; Zhang & Parker, 2019). In the validation study of the scale, Demerouti and Peeters (2018) found that optimising job demands were linked to high levels of work engagement in the cross-sectional data of Dutch workers. Since other job crafting strategies (namely increasing structural job resources and increasing challenging job demands) have also been shown to be linked to lower stress during enforced remote work (Ingusci et al., 2021), we expect that:

Hypothesis 5: High level of optimizing job demands increases the likelihood of belonging to profiles where work engagement is at a high level or increases during follow-up.

Method

Participants and procedure

The data used in this study was collected as a part of the research project "Safely remotely – occupational well-being and its management in telework", funded by the Finnish Work

Environment Fund. The goal of the research project was to examine higher education employees' experiences of enforced remote work during the COVID-19 pandemic. The participants were employees of a university community in southwestern Finland, comprising three campuses and other units. The participants have worked remotely since March 2020 due to governmental recommendations. The data set was collected in accordance with the guidelines of the Finnish National Board on Research Integrity and of the Finnish Personal Data Act. The authors were granted permission to carry out the study by the rectors and directors of human resources of the university community.

The longitudinal data was collected using the electronic LimeSurvey tool with four measurement points: April 2020 (T1), June 2020 (T2), October 2020 (T3), and February 2021 (T4). At Time 1, the survey was sent to the work email addresses of 6929 employees through the university's general mailing list. Participants were informed by email about the survey before it was sent to them, and they were reminded about the survey a week after receiving it. Of the eligible survey recipients ($n = 6929$), 2661 employees (including grant holders working under a resource agreement) responded to the first survey, hence yielding the response rate of 38%. At T2, invitations to participate in a follow-up survey were sent to 1443 employees who had expressed their willingness to participate in the follow-up and had given their email address for this purpose at T1. The follow-up survey was available from June 1 to 15, 2020, and one reminder was sent to non-responders. Altogether 909 employees completed the second survey, yielding a T1–T2 response rate of 63%. At T3, survey invitations were sent to 824 employees who had participated in both earlier surveys and were willing to continue their participation. The T3 survey was available from October 19 to November 2, 2020, and two reminders were sent to non-responders. Altogether 670 employees completed the third survey. Ten recipients were no longer working for the university or were unavailable (e.g. on leave) at the time of the survey. Taking this into account, the response rate at T2–T3 was 82%. At T4, the survey was sent to 654 employees who had previously participated and were willing to continue their participation. The T4 survey was available from February 15 to March 1, 2021, and two reminders were sent to non-responders. At T4, altogether 535 employees completed the fourth survey. Eleven recipients were no longer working for the university or were unavailable at the time of the survey. Taking this into account, the response rate at T3–T4 was 83%.

The sample of the present study ($n = 455$) consists of those respondents who had employment contracts with the university at all measurement points and responded to all surveys; doctoral students and grant holders working under resource agreement were excluded from the sample. Of the participants, 52.5% were administrative and support staff and 47.5% were teaching and research staff at T1. Women accounted for 73% of the participants and the average age at the beginning of the study was 46.5 years ($SD = 10.04$). Eighty percent of the respondents were in a pair relationship. The most common educational background was a master's degree (47%), followed by a doctoral degree (32%). At T1, all the respondents were working remotely due to the lockdown, at T2 96%, at T3 89%, and at T4 91%. One third of the participants (27%) had no previous remote work experience prior to March 2020, and 39% had worked remotely less than one day per week prior the COVID-19.

Measures

Organisational support was measured with six items developed specifically for this study: (1) “The top management has communicated clearly about the current coronavirus crisis”; (2) “My practical questions have been answered quickly enough”; (3) “I have received enough instructions on performing my tasks and duties from home”; (4) “I have received support for my work when I have encountered difficulties”; (5) “I have received enough instructions for using the electronic systems and tools (such as Teams, Zoom, Panopto, Moodle)”; (6) “The electronic systems and tools (such as Teams, Zoom, Panopto, Moodle) have worked well technically”. The items were scored on a 5-point rating scale (1 = strongly disagree, 5 = strongly agree). The factor analysis for the scale, reported in Mäkikangas et al. (2020), supported a one-factor structure. The Cronbach’s alphas for the scale varied between .79 and .83 across measurements.

Functionality of home as a work environment was measured with six items developed specifically for the purposes of this study: (1) “I have adequate space at home for remote working”; (2) “I have the necessary equipment at home for remote working”; (3) “I can find enough peace at home for working”; (4) “I can maintain a healthy work-life balance when working from home”; (5) “My home internet connection works well enough”; (6) “I can maintain good working postures and ergonomics when working from home”. These items were also scored on a 5-point scale (1 = strongly disagree, 5 = strongly agree). This scale was also analyzed to comprise one factor (Mäkikangas et al., 2020). The Cronbach’s alphas for the scale varied between .69 and .82.

Job-related self-efficacy was measured using four items modified from the Generalised Self-efficacy Scale (Schwarzer & Jerusalem, 1995; see also Hakanen et al., 2012): (1) “I can usually handle whatever comes my way in my professional life”; (2) “I am confident that I could deal efficiently with unexpected events in my work”; (3) “I can remain calm when facing difficulties in my work because I can rely on my coping abilities”; (4) “Thanks to my resourcefulness, I know how to handle unforeseen situations in my work”. The items were assessed on a 5-point scale (1 = strongly disagree, 5 = strongly agree). The Cronbach’s alphas for the scale varied between .83 and .89.

Job crafting was measured using four items focusing on optimising job demands (Demerouti & Peeters, 2018): (1) “I have improved work processes or procedures to make my work easier”, (2) “I have come up with solutions that make the completion of my tasks easier”; (3) “I have looked for ways to complete my tasks more efficiently”; (4) “I have changed the work processes or procedures that are delaying my work”. The items were scored on a 5-point scale (1 = never, 5 = always). The Cronbach’s alphas for the scale varied between .87 and .90.

Work engagement was measured with the short 3-item version of the Utrecht Work Engagement Scale (UWES-3; Schaufeli et al., 2019): (1) “I have felt bursting with energy while working”, (2) “I have been enthusiastic about my work”, (3) “I have been immersed in my work”. The items were scored on a 5-point scale (1 = never, 5 = always). The Cronbach’s alphas for the scale varied between .81 and .85.

Gender (1 = men, 2 = women), age in years, education (1 = upper secondary school, 4 = doctoral degree), relationship status (1 = in a relationship, 2 = no relationship), number of under school-aged children living at home, number of school-aged children living at

home, job position (1 = teaching and research staff, 2 = administrative and support staff) and remote work experience before COVID-19 (continuous variable; 1 = not at all, 5 = more than 90% of working time) were used as background variables. Table 1 shows the means, standard deviations, and correlations for the study variables.

Attrition analysis

An attrition analysis was conducted to examine potential baseline differences between the current study sample ($n = 455$) and those who only participated at T1 ($n = 1,152$). Women (proportion in the study sample 73%, proportion in the attrition group 58%, $\chi^2(3) = 32.22$, $p < .001$) and administrative and support staff (proportion in the study sample 52.5%, proportion in the attrition group 40.5%, $\chi^2(1) = 19.03$, $p < .001$) were over-represented in the study sample. The study sample moreover had higher mean in organisational support (4.15 vs. 3.93, $p < .001$), functionality of home as a work environment (3.93 vs. 3.80, $p < .01$), and job-related self-efficacy (4.09 vs. 4.00, $p < .05$) than the attrition group. The groups did not differ from each other in age, $t(886.02) = 0.05$, $p = .964$, education, $\chi^2(3) = 1.08$, $p = .782$, the number of under school-age children living at home, $t(1374) = 0.24$, $p = .812$, the number of school-age children living at home, $t(1373) = -0.78$, $p = .436$, job crafting, $t(1479) = -0.85$, $p = .393$, or work engagement, $t(1494) = -0.18$, $p = .861$.

Statistical analysis

Latent Profile Analysis (LPA; McLachlan & Peel, 2000) was used to identify longitudinal profiles of work engagement. LPA identifies beforehand unknown latent profiles from the observed data and estimates the parameters for these profiles (Muthén & Muthén, 1998–2017). Longitudinal work engagement profiles were estimated based on the levels of and changes in work engagement from Time 1 (April 2020) to Time 4 (February 2021). Work engagement means were allowed to be freely estimated across the profiles, but the variances between the profiles were constrained to be equal. In LPA, the covariance structure of the variables is explained through the mean differences according to local independence assumption (Oberski, 2016). The parameters of the profile solutions were estimated using maximum likelihood with robust standard errors (MLR; Muthén & Muthén, 1998–2017). The FIML (full information maximum likelihood) method was used to process the missing data. The LPAs were performed using Mplus (version 8.5) (Muthén & Muthén, 1998–2017).

To determine the number of latent profiles, we used the following fit indices and statistical tests (Nylund et al., 2007): (1) AIC index (Akaike Information Criterion), (2) BIC index (Bayesian Information Criterion), (3) aBIC index (adjusted Bayesian Information Criterion), (4) VLMR test (Vuong-Lo-Mendell-Rubin Test), (5) LMR test (Lo-Mendell-Rubin Test), (6) BLRT test (Bootstrap Likelihood Ratio Test), and (7) entropy value. In addition, the theoretical interpretability and meaningfulness of the profile content was also included among the selection criteria. Lower AIC and BIC values indicate the superiority of the model under consideration compared to other solutions. A statistically significant p -value for the LMR, VLMR and BLRT tests indicates that a model with k number of profiles must be rejected compared to a model with at least $k + 1$ profiles.

Table 1. Descriptive information on the study variables ($n = 416\text{--}435$).

Variables	M/%	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Gender ¹	73% ^a	0.42															
2. Age in years	46.54	10.04	−0.04														
3. Education ²	3.02	0.86	−0.24	0.00													
4. Relationship status ³	80% ^b	0.38	−0.03	0.03	−0.12												
5. Under school-aged children ⁴	1.25	0.61	−0.04	−0.01	0.05	−0.11											
6. School-aged children ⁵	1.54	0.87	−0.04	0.04	0.15	−0.25	0.17										
7. Job position ⁶	53% ^c	0.50	0.18	−0.06	−0.51	0.10	−0.01	−0.04									
8. Experience from remote work ⁷	2.28	1.05	0.00	0.03	0.21	−0.16	0.01	0.07	−0.29								
9. Organisational support T1	4.15	0.63	0.01	−0.02	−0.04	−0.04	0.00	−0.01	0.13	0.08							
10. Functionality of home ⁸ T1	3.93	0.78	0.00	−0.04	−0.13	−0.03	−0.31	−0.16	0.12	0.15	0.25						
11. Job-related self-efficacy T1	4.09	0.66	0.03	−0.03	−0.13	−0.10	−0.10	0.00	0.15	0.09	0.31	0.27					
12. Optimising job demands T1	3.19	0.73	0.03	0.02	−0.04	−0.07	0.01	−0.02	−0.03	0.04	0.10	0.01	0.17				
13. Work engagement T1	3.34	0.69	0.14	−0.02	−0.20	−0.06	−0.11	−0.07	0.12	0.07	0.28	0.34	0.49	0.26			
14. Work engagement T2	3.38	0.68	0.13	0.03	−0.09	−0.12	−0.09	0.04	0.08	0.14	0.30	0.23	0.44	0.21	0.69		
15. Work engagement T3	3.33	0.64	0.17	0.01	−0.10	−0.10	−0.07	0.04	0.06	0.11	0.28	0.22	0.39	0.17	0.59	0.68	
16. Work engagement T4	3.28	0.69	0.18	0.01	−0.09	−0.16	−0.05	0.03	0.05	0.15	0.28	0.19	0.33	0.17	0.57	0.66	0.75

Note. ¹Gender (1 = man, 2 = woman^a), ²Education (1 = upper secondary school, 4 = doctoral degree), ³relationship status (1 = in a relationship^b, 2 = no relationship), ⁴number of under school-aged children living at home, ⁵number of school-aged children living at home, ⁶job position (1 = teaching and research staff, 2 = administrative staff^c), ⁷experience from remote work before COVID-19 (continuous variable; 1 = not at all, 5 = more than 90% of working time), and ⁸functionality of home as work environment. if $r = |0.09\text{--}0.12|$, $p < .05$; if $r = |0.13\text{--}0.16|$, $p < .01$; if $r \geq 0.17$, $p < .001$.

The entropy value indicates the quality of the profiling: the closer the entropy value is to 1, the higher is the precision with which the cases are classified into profiles (Celeux & Soromenho, 1996). Entropy values greater than .70 are considered acceptable (Celeux & Soromenho, 1996).

After the longitudinal profiles of work engagement were identified, we examined the relationship of background variables, remote-work specific job, and personal resources to work engagement profiles. These analyses were performed by the R3STEP method (Asparouhov & Muthén, 2014). The R3STEP method uses multinomial logistic regression analysis to predict belonging to a profile with values of antecedent variables. The R3STEP method has several advantages: it takes into account the varying probabilities of belonging to profiles and the antecedent variables analyzed do not affect the content of the profile solution (Asparouhov & Muthén, 2014). The interpretation of multinomial logistic regression analysis was made using the model estimates, i.e. their values describe the increased or decreased probability of belonging to the latent profiles being compared (Asparouhov & Muthén, 2014). We have reported odds ratios (ORs) based on the regression coefficients (beta) of the models. A coefficient ratio of 3 corresponds to a 3:1 ratio, i.e. an increase of one standard deviation in the predictive variable triples the probability of being in the first latent profile of the two comparison profiles (see Morin et al., 2016).

Results

Longitudinal profiles of work engagement

In the first phase, longitudinal profiles of work engagement were identified using the LPA. The fit indices and statistical tests for the alternative profile solutions are presented in Table 2. Both the VLMR and LMR tests converged on the three-profile solution, whereas the BLRT did not converge on any specific profile solution. AIC, BIC, and aBIC reached their lowest point for the five-profile solution. However, one of its profiles was very small, consisting of only 2% ($n = 9$) of the participants. Therefore, these results suggest that the optimal number of profiles was three or four, which were next examined more closely. Comparison of the profile content revealed that the four-profile solution resulted in a qualitatively meaningful novel profile displaying very low mean levels of work engagement. In addition, entropy values and average latent class posterior probabilities were high in the four-profile solution. Based on all available information, the four-profile solution was selected for the subsequent analyses.

The four longitudinal profiles of work engagement are illustrated in Figure 1. The first profile contained 36% of the participants and was characterised by high level of work engagement. It is apparent, although not statistically significant, that work engagement increased slightly at T2, but then reverted to its initial level by T3 and T4. Hence, this profile was labelled *High initially increasing work engagement*. The second and largest profile contained 39% of the participants and was characterised by a longitudinal trend similar to the first profile. In contrast, work engagement in this second profile was at the average level, and thus this profile was labelled *Average initially increasing work engagement*. A contrasting temporal trend was evident among the two smaller profiles. The profile consisting of 20% of the participants exhibited average levels of

Table 2. Enumeration of fit statistics for longitudinal work engagement profiles.

Number of profiles	LL	FP	AIC	BIC	aBIC	VLMR (p)	LMR (p)	BLRT (p)	Entropy	Latent profile proportions %
1	−1876.38	8	3768.77	3801.73	3776.34	–	–	–	–	100
2	−1546.39	13	3118.78	3172.34	3131.09	<.001	<.001	<.001	.85	31/69
3	−1416.20	18	2868.40	2942.56	2885.44	<.01	<.01	<.001	.84	44/44/12
4	−1375.83	23	2797.66	2892.42	2819.43	.053	.057	<.001	.82	39/36/20/5
5	−1354.81	28	2765.62	2880.99	2792.12	.196	.204	<.001	.81	8/2/21/35/34

Note. LL = log-likelihood; FP = free parameters; AIC = Akaike information criterion; BIC = Bayesian information criterion; aBIC = sample-size adjusted Bayesian information criterion; VLMR = Vuong-Lo-Mendell-Rubin test; LMR = Lo-Mendell-Rubin test; BLRT = Bootstrapped likelihood ratio test.

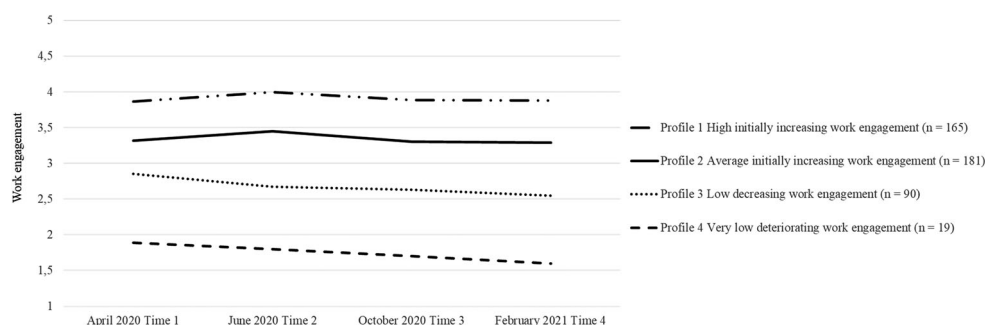


Figure 1. Latent longitudinal profiles of work engagement.

Note. The y axis refers to participants' level of work engagement (1 = never, 5 = always).

work engagement that showed a steady significant decrease over time. This profile was labelled *Low decreasing work engagement*. The fourth and smallest profile included the remaining 5% of the participants, which were characterised by low baseline level of work engagement which further significantly decreased over the ten-month follow-up period. This profile was labelled *Very low deteriorating work engagement*.

To conclude, our first hypothesis was supported, as our results yielded work engagement profiles consisting of different levels and longitudinal trends.

Differences in job resources and personal strengths and behaviours between longitudinal profiles of work engagement

Table 3 presents the results of a multinomial logistic regression analysis in which the work engagement profiles were predicted by background variables and job resources and personal strengths and behaviours specific to remote work. Profile 1 *High initially increasing work engagement* was used as a reference profile in the analyses. Work engagement profiles did not differ in terms of relationship status, number of under school-aged or school-aged children living at home, job position, or previous experience of remote work. However, statistically significant differences were observed in gender, age, and education. Women were more likely to be in the profile *High initially increasing work engagement* than in the profile *Very low deteriorating work engagement*. Older employees were most likely to belong to the profile *High initially increasing work engagement* than to the other profiles. In addition, those with a lower level of education were more likely to belong to the profiles *Average initially increasing work engagement* and *Low decreasing work engagement* than in the reference profile 1.

High level of organisational support increased the probability of being in the profile *High initially increasing work engagement* rather than in the other profiles. The results further showed that employees who rated the functionality of home at a high level were more likely to be in the profile *High initially increasing work engagement* than in the profile 3, namely *Low decreasing work engagement*. Furthermore, job-related self-efficacy differentiated the profiles. That is, high level of job-related self-efficacy increased the probability of belonging to the *High initially increasing work engagement* profile compared to others. Finally, high level of optimising job demands increased the likelihood of

Table 3. Antecedents of work engagement profiles.³

Antecedent variables	Profile 1 vs. Profile 2				Profile 1 vs. Profile 3				Profile 1 vs. Profile 4			
	Coef.	S.E.	p-value	OR	Coef.	S.E.	p-value	OR	Coef.	S.E.	p-value	OR
Gender ¹	.59	.42	.161	1.80	.80	.47	.092	2.23	3.53	1.16	.002	34.12
Age in years	.05	.01	.001	1.05	.06	.02	.003	1.06	.07	.03	.016	1.07
Education ²	-.59	.24	.015	0.55	-.97	.35	.005	0.38	.53	.49	.275	1.70
Relationship status ³	-.09	.48	.838	0.91	-.87	.52	.096	0.42	-.21	.78	.780	0.81
Under school-aged children ⁴	.63	.32	.051	1.87	.49	.41	.229	1.63	.67	.69	.344	1.95
School-aged children ⁵	-.20	.22	.358	1.22	-.68	.38	.070	1.97	.30	.46	.507	1.35
Job position ⁶	-.53	.41	.203	0.59	-.28	.51	.577	0.76	.05	.79	.942	1.05
Experience from remote work ⁷	.29	.16	.073	1.34	.23	.19	.220	1.26	.55	.50	.271	1.73
Organisational support	.80	.30	.009	2.23	1.52	.36	.000	4.57	1.24	.64	.055	3.46
Functionality of home as a work environment	.25	.22	.270	1.28	.70	.26	.008	2.01	.75	.45	.098	2.12
Job-related self-efficacy	.87	.36	.018	2.39	1.39	.43	.001	4.01	3.31	.70	.000	27.39
Optimising job demands	.22	.21	.309	1.25	.52	.28	.065	1.68	1.29	.55	.020	3.63

Note. Profile 1 High initially increasing work engagement was used as a reference profile. ¹Gender (1 = man, 2 = woman), ²Education (1 = upper secondary school, 4 = doctoral degree), ³relationship status (1 = in a relationship, 2 = no relationship), ⁴number of under school-aged children living at home, ⁵number of school-aged children living at home, ⁶job position (1 = teaching and research staff, 2 = administrative staff), ⁷experience from remote work before COVID-19 (continuous variable; 1 = not at all, 5 = more than 90% of working time). Coef. = the estimate (β) from the R3STEP multinomial logistic regression analysis: Positive estimate values describe a higher probability of belonging in the first latent profile of the two comparison profiles. S.E. = standard error, OR = odds ratio.

belonging to the profile *High initially increasing work engagement* instead of *Very low deteriorating work engagement*.

Additional analysis

It is plausible that the mean values of the antecedents of work engagement used vary over time. Therefore, possible longitudinal changes in these were tested for using the GLM Repeated Measures procedure. The results revealed that no statistically significant mean level changes were discernible in job crafting, $F(451, 3) = 1.94$, $p = .121$. However, organisational support ($F(451, 3) = 64.71$, $p < .001$) and job-related self-efficacy ($F(451, 3) = 21.48$, $p < .001$) decreased linearly over time, whereas the functionality of home as a work environment improved between T3 and T4 ($F(451, 3) = 4.27$, $p < .01$). Therefore, R3STEP auxiliary testing was conducted for these variables separately at T2–T4.

According to the additional testing, the profile differences reported above were also apparent for organisational support at T2–T4. That is, high organisational support at T2, T3, and T4 increased the likelihood of belonging to the *High initially increasing work engagement* profile compared with the other profiles. Relating to the functionality of home as a work environment measured at T2–T4, more profile differences were evident. That is, at T2, a high level of functionality of home increased the likelihood of belonging to the *High initially increasing work engagement* profile compared with all the other profiles. However, at T3 and T4, statistically significant differences were only evident concerning *High initially increasing work engagement* vs. *Very low deteriorating work engagement* and *Low decreasing work engagement*. Relating to job-related self-efficacy, the same profile differences were evident in four measurements: high level of

efficacy increased the likelihood of belonging to the *High initially increasing work engagement* profile compared with the others.

To conclude, as organisational support, functionality of home as a work environment, job-related self-efficacy, and optimising job demands characterised the profile with a high work engagement level through the follow-up, our hypotheses 2–5 were supported.

Discussion

The remote work literature so far has mainly used a variable-centered approach to investigate job-related well-being and its antecedents. It has also been typical, especially in literature prior to COVID-19, that studies have been largely cross-sectional (for a review, see Charalampous et al., 2019). Our study contributed to the literature by adopting a person-centered approach and investigating longitudinal profiles of work engagement and whether the profiles identified can be differentiated on the bases of their relations with job resources specific to remote work and of personal strengths and behaviours. Using a four-wave data over a period of ten months, we were able to identify altogether four profiles that highlighted the within-person work engagement processes during remote work that would have been missed utilizing a variable-centered approach. Therefore, our study is a necessary pioneering attempt to understand the heterogeneity of the remote work experience. Moreover, we were able to identify meaningful differences between profiles in remote work-specific job resources as well as personal strengths and behaviours, suggesting that both job and personality resources and proactive behaviour are conducive to successful and motivating remote work. These contributions are discussed below in more detail.

Main findings and theoretical implications

The results provided empirical evidence to support the proposition that job-related well-being experiences during enforced remote work differ greatly. Lending support to our first hypothesis, we were able to identify four work engagement profiles, namely *High initially increasing work engagement*, *Average initially increasing work engagement*, *Low decreasing work engagement*, and *Very low deteriorating work engagement*. Among the first two of these, the temporal development of work engagement was fairly favourable: immediately after the transition to enforced remote work, the mean level of work engagement increased slightly, and later maintenance of the initial level of work engagement was evident among employees belonging to these profiles. Numerically these were the most typical developmental profiles, accounting for altogether 75% of the study participants. These results also highlight that among the majority of the higher education employees studied, the transition to remote work went well and they were able to maintain their work engagement levels despite the prolonged remote work.

However, our findings also revealed different work engagement processes during the remote work. Namely, in two profiles comprising altogether one-fifth of the study participants, a decrease in work engagement level was evident. These longitudinal processes are in accordance with earlier variable-centered results suggesting decrease in work engagement during the prolonged COVID-19 pandemic (Oksa et al., 2021; Syrek et al., 2022). These results indicate that remote working has been difficult for some

employees, and there may be many explanations for it relating to work and family situation, as well as the general burden of the corona pandemic and its effects on life overall. In our study, younger and less educated employees were more likely to belong to these disadvantaged work engagement profiles, thereby supporting earlier variable-centered work engagement studies (Hakanen et al., 2019). This may reflect competence problems associated with the job tasks, and perhaps the employees were not yet used to self-leading their working due to having less work experience. Moreover, it may be that younger individuals suffered psychologically more from the pandemic than older people with already established family and work conditions (see Groarke et al., 2020). However, it should be noted that in our study, job position, relationship status or number of under-school age and school-aged children did not differentiate the profiles.

The job and personal resources and behaviours specific to remote work were more meaningful antecedents of the profiles than were the background factors considered. Our results concur with the JD-R theory (Bakker & Demerouti, 2017), suggesting that high job resources are conducive to work engagement. By applying the basic tenets of the JD-R theory to remote work, we were able to demonstrate that both the remote-work specific job resources investigated, namely organisational support and functionality of home as a work environment, were crucial for work engagement and its maintenance in remote work. Lending support to our second hypothesis, high perceived organisational support characterised employees belonging to the *High initially increasing work engagement* profile compared with those belonging to the other profiles. It is noteworthy that a difference also emerged between high and average work engagement profiles, highlighting the importance of organisational actions during remote work for employees' energy and commitment, that is, for high engagement. Consequently, timely advice, clear information, and remote work practices, together with functional equipment and guidance in its use, are crucial conditions not only to avoid stress and exhaustion (Mäkinen et al., 2021), but also for to maintain work engagement in remote work.

Furthermore, our study contributed to the remote work engagement literature by showing that the functionality of home as a work environment facilitated work engagement, thereby supporting our third hypothesis. Work environment measured by its physical correlates has already been linked to work engagement in a cross-sectional study with a variable-centered approach (Duque et al., 2020). Our study demonstrated the significance of effective working conditions longitudinally and considering the various work engagement profiles. In our study, the difference in the functionality of home emerged especially between the high and the two low and decreasing work engagement profiles. As the high and average work engagement profiles differed in the functionality of home as a remote work environment only at T2, it is plausible that the home work environment constitutes a necessary condition to accomplish remote work effectively, but it may act as a boundary condition for the utilization of other, more intrinsically motivating job resources.

Of the employee personal resources and behaviours, high job-related self-efficacy, and job crafting via optimising job demands increased the likelihood of being in profiles where work engagement remained at high levels during follow-up, thereby lending support to our hypotheses four and five. More specifically, the belief that one can cope with the challenges of work and develop one's own work practices to suit the remote work situation were significant factors contributing to work engagement. Of these two,

optimising job demands specifically differentiated between the high and very low work engagement profiles, thereby supporting the assumption that this crafting strategy deserves its place among the approach-type of job crafting (Demerouti & Peeters, 2018). Moreover, although the levels of job-related self-efficacy generally decreased during follow-up, it constantly characterised employees who belonged to the high work engagement profiles in contrast to the others. Overall, these results are in line with the JD-R theory (Bakker & Demerouti, 2017) and earlier job crafting and self-efficacy research conducted in ordinary work conditions (for reviews and meta-analyses, see Lichtenthaler & Fischbach, 2019; Mäkikangas et al., 2013; Rudolph et al., 2017) demonstrating the effects of personal resources and proactive behaviours on work engagement. Consequently, both employee dispositions as well as active, self-initiative actions are needed to facilitate and create job conditions that foster remote work engagement.

It is also a highly relevant finding that the initial level of work engagement was a determinant of its subsequent development. That is, those employees who at the beginning of the remote work were energetic, committed, and motivated were able to maintain their level of work engagement during the prolonged remote work, and even slightly increase it during the first two months. Different temporal development was evident among employees whose level of work engagement was rather low at the first stage: their work engagement levels decreased. This result supports work engagement being of itself a crucial resource with a motivating and energizing effect. Moreover, in earlier longitudinal studies, the baseline level of work engagement has contributed to explaining the strength of the subsequent relationship between job resources and work engagement (Seppälä et al., 2020). Moreover, a high level of work engagement has also been shown to facilitate more positive attitudes and proactive behaviour, and hence also to foster personal resources during organisational change process (Mäkikangas et al., 2019).

Altogether this evidence suggests that engaged workers are able to maintain their well-being at work by more effective utilization of the available job resources and proactive behaviour, even in challenging work situations like those studied here. Therefore, work engagement is not merely an outcome, but also a precondition of the well-being-maintaining processes as also acknowledged in earlier studies (Mäkikangas et al., 2019; Seppälä et al., 2020). All in all, the results reported here are applicable to the enforced remote work context, and thus differ from the typical multi-locational work situation with high level of autonomy as regards where to work and to what extent home-based remote work is utilised. As in the post-COVID era high autonomy can be expected, a high level of work engagement is also likely to characterise working. Consequently, the decreasing trends of work engagement evident in our findings are less likely.

Practical implications

This study conducted among remote homeworkers during the corona crisis can, beyond the context of the pandemic, also offer valuable guidelines for flexible work practices in a post-pandemic future. As multi-locational work and flexible work arrangements are predicted to be increasingly available to employees, we present various guidelines for managers and employees for future practices based on our results.

First, since a decrease was observed among those whose work engagement was low at baseline, it is important for organisations to monitor well-being and to identify employees struggling with well-being challenges as they are likely to need special support in the transition to remote work or similar changes. It is plausible that an initially low level of well-being will require support to adapt to the various changes.

Second, our results demonstrated that the functionality of the home as a work environment had a favourable effect on the longitudinal development of work engagement. The role of the physical environment in work engagement has been demonstrated earlier (Duque et al., 2020). Besides functional workspace, telecommunication connections, and suitable software are crucial to maintaining well-being in remote work according to our results. After COVID-19, multi-locational work can be done elsewhere than at the actual main workplace and home, such as in various public spaces, on the customer's premises, in shared spaces, office hotels, or when traveling in vehicles (Vartiainen & Hyrkkänen, 2010). Consequently, ergonomics at work may vary a lot or even prove inadequate, and interruptions and lack of a peaceful environment at work may constitute a challenge (Beauregard et al., 2019). Therefore, it is essential that highly functioning remote work equipment as well as healthy and safe working conditions other than at the office are available. This applies to physical and cognitive as well as to organisational matters, and there is also a body of occupational health and safety legislation that also applies to working remotely. In Finland, remote work is supported by tax incentives and the employer can also, through taxable income, aid in equipping the home office.

Third, attention should also be paid to ensuring that organisations provide adequate support for remote work. Emphasis should be placed on remote task support including technical support for working remotely, updated information dissemination, and open communication. These are the key indicators demonstrated in our study to identified facilitating employee work engagement – issues also recognised also by other studies (Chong et al., 2020; Mihalance & Mihalance, 2022; Nayani et al., 2018; Richter, 2020). Managers and supervisors play a crucial role in organising and conveying organisational support. In the post-COVID era of increased multi-location work, besides consensually shared and agreed remote work guidelines and expectations, leadership based on trust and sensitivity to variation in states of well-being at work will be vital when physical interaction is limited.

Fourth, remote work also requires self-management capability for individual employees and the potential to modify ways, methods, and time of work to suit their preferences. Therefore, job crafting is a much-needed behaviour in multi-locational work, as it was identified as a crucial facilitator of work engagement in the present study. Job crafting is employee-initiated behaviour but can be fostered by HR practices focusing on commitment (Hu et al., 2020) and opportunity-enhancing (Kooij et al., 2021), for example, fostering training and feedback as well as appraisal aimed at employee development. Leadership style, such as servant leadership (Harju et al., 2018) and empowering leadership (Thun & Bakker, 2018) have also been found to foster employee job crafting behaviour and employee well-being overall (Eva et al., 2019; Kim et al., 2018) and are thus much needed leadership qualities during remote work. Finally, our research findings lend support to the notion that the extent to which employees feel equipped to meet the challenges posed by their jobs, i.e. high job-related self-efficacy beliefs, was among the most important factors explaining high levels of work engagement during remote

work. In order to develop high self-efficacy beliefs in the work context, concrete instructions, encouraging feedback, successful work experiences and opportunities for vicarious learning are needed (Bandura, 1997; Mäkinen et al., 2019). Moreover, there also is evidence to suggest that job-related self-efficacy can be acquired through stress management courses and web-based interventions (Fülleman et al., 2015; Ouwenel et al., 2013). Job-specific self-efficacy should be carefully considered among young and less experienced workers who in the present study belonged to the profiles among which work engagement decreased over time.

Limitations and directions for future research

Despite the noteworthy strengths of the present study, such as focusing on remote work engagement by taking account of differing experiences and characterising the profiles by using remote work-specific resources, there are certain limitations that should be acknowledged. First, relating to the generalizability of these results, our sample is limited to higher education employees. Thus, the results of the study cannot be directly generalised to other professional groups working in different occupational fields. The higher education employees studied here may on average, be more accustomed to working remotely than employees in other fields. It is also plausible that due to the high level of job autonomy and relatively low level of inter-dependence between employees, this profession may be better suited to remote worker than employees working, for example, in high interdependence teams. Moreover, the participants investigated can be considered well-off compared, for example, to workers who were laid off or were at risk of losing their jobs because of the corona pandemic.

Second, our dataset consisted of female-dominated, highly educated, and middle-aged employees. Consequently, we cannot be sure that the same longitudinal profiles of work engagement would emerge in other types of samples. Replication of profiles is thus much needed. Third, the initial (T1) response rate was 38%, which is above the average for organisation-based samples (Baruch & Holtom, 2008), but still leaves room to suspect initial selective attrition. Moreover, although our longitudinal response rates were high, significant attrition in the longitudinal data was evident. That is, women and administrative staff were over-represented in the longitudinal data. In addition, those employees with higher initial levels of perceived organisational support, functionality of the home as a work environment and job-related self-efficacy were likewise over-represented. Attrition was not apparent in our main construct, namely work engagement. However, how such attrition would have affected the relationships studied is open to speculation.

Fourth, the relationships between antecedents and work engagement should be critically assessed. Although they were theoretically aligned, it is not possible to determine, based on this study, whether job resources and personal strengths and behaviours lead to higher work engagement or vice versa, as reciprocal relationships have been evident in earlier research (see e.g. Lichtenhaler & Fischbach, 2019; Mälikangas et al., 2013). Moreover, the question of causality is given less weight in person-centered than in variable-centered studies (Bergman & Lundh, 2015). Fifth and finally, the Likert response scale of 1 (never) – 5 (always) was applied to work engagement instead of the more typical 0–6 scale (Schaufeli et al., 2002). This solution, chosen in order to improve the consistency between the scales included in the survey, reduces the variance in work

engagement and weakens the comparability of mean levels with other studies. However, it has no effect on the profiles identified and the direction of their development over time.

In the future, more longitudinal studies are needed to further investigate how job-related well-being develops after the pandemic. For example, it will be imperative to monitor whether well-being improves among those who suffered and struggled due to the enforced remote work. In addition, it is known that various personality dispositions and job crafting behaviours are linked to work engagement along with job resources (e.g. Lichtenthaler & Fischbach, 2019; Mäkikangas et al., 2013). Therefore, future research could also explore how various employee resources (e.g. resilience) and job characteristics (e.g. social support from colleagues) are linked to work engagement profiles. Moreover, time-spatial job crafting, referring to active changes that employees make in their job relating to working hours and locations of work (Wessels et al., 2019) together with boundary crafting and management (Bulger et al., 2007) would be a relevant target of investigation among remote workers. Moreover, it will continue to be important for future research to rely on more diversified settings in terms of study designs (e.g. daily diary setting, qualitative research) and diverse professions. It would also be relevant to investigate remote work from the perspectives of the organisation's management and supervisors. Furthermore, our results highlight the importance of continuing person-centered research to in order to understand the varying employee experiences during and after the pandemic.

Conclusions

Work engagement remained at its high or average levels among most of the participants in our sample. Different trajectories were also evident, and they suggest varying remote work experiences. Therefore, when returning to the office, it is important to consider the suitability of multi-locational work individually. It is furthermore vital to resource multi-locational work through organisational support and to give employees the skills and freedom to craft their jobs to best suit themselves and their own life situations. Concerning the broader change in working life, the coming years will show whether flexible working arrangements and multi-locational work will become typical work arrangements among knowledge workers.

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