Getting the measure of remote e-working: a revision and further validation of the E-work life scale

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Abstract

Purpose: This paper aimed to revise and further validate the published E-Work Life (EWL) scale. The EWL was originally developed to assess theoretically relevant aspects of the remote e-working experience related to four main areas: *organisational trust*, *flexibility*, *work-life interference*, and *productivity*.

Design/methodology/approach: A number of changes were implemented to the scale (i.e., including new items, rewording of existing items) following a recent qualitative study conducted by the authors. The two studies outlined in this paper, conducted within discrete remote e-working populations, resulted in a validated and adjusted 20-item version of the scale.

Findings: Study 1 performs Confirmatory Factor Analysis (CFA) on data from a sample of 399 U.K. remote e-workers (57.9% female) to check the factor structure of the revised version of the EWL scale and the reliability of the posited dimensions. Results provided support for a 20-item scale, replicating the factorial structure of the original version. **Study 2** tests and confirms the factorial structure of the final 20-item EWL scale in an independent sample of 366 U.K. remote e-workers (48.6% female). Study 2 provides further evidence of EWL scale's reliability and validity, with the four factors of the scale being significantly correlated with positive mental health, detachment from work, and technostress.

Originality: The EWL is a very timely and important tool which provides an overall framework of the key areas that are affecting remote e-workers' life; whose greater understanding may better prepare organisations to adapt work arrangements and introduce support policies and guidance.

Keywords: remote e-working, work-life balance, productivity, flexibility, scale revision; well-being.

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1. Introduction

Remote e-working has been in practice as a working style for several decades. Since Nilles (1975) firstly introduced telecommuting a virtual working arrangement which allowed individuals to work from home by using technology to communicate with their workplace; a variety of definitions and terms have been used. In particular, telework, remote e-work, virtual work, flexible work (Allen *et al.*, 2015) and more recently agile work (Grant and Russell, 2021), among other labels, have been used to indicate work which is not constrained to an office environment, making use of communication tools (such as email and video calls). Remote e-working has been constantly but relatively slowly increasing over the past two decades (Eurofound and ILO, 2017). However COVID-19 and the need to tackle the issues raised by the pandemic in the beginning of 2020 led to a sudden, pervasive, and extended adoption of remote working practices, that is anticipated to be here to stay (Eurofound, 2020). According to Eurofound (2020) after the stay-home orders from the government, almost 4 in 10 employees in Europe started e-working remotely. However, approximately 24% of employees who were working remotely in Europe had never worked in this way before, in contrast to 56% of employees who occasionally had some experience of remote e-working (ILO, 2020). Although the growing remote e-working numbers suggested that a lot more jobs can be performed from a distance than previously assumed, it is worth considering that not all organisations and employers were well prepared nor familiar with this working practice and, which raised the issue about how best to support themselves and their employees (Milasi *et al.*, 2020). In addition, a large and diverse virtual team of researchers (i.e., Kniffin *et al.*, 2021) discussed the implications, issues and insights for future research and action, suggesting that the virtual work practices resulted from COVID-19 will demand individuals to work in ways far different from how previous generations worked. Thus, the importance of tackling and measuring

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issues raised by remote e-working is enhanced, as well as the need to ensure that individuals remain productive, and satisfied when working away from their office premises.

A great amount of research has already been conducted on the topic with scholars attempting to identify remote e-working's benefits and drawbacks (see Allen *et al.*, 2015; Charalampous *et al.*, 2019; Gajendran and Harisson, 2007; Oakman *et al.*, 2020 for reviews of the literature). The EWL scale, developed by Grant *et al.* (2019) who conducted research in this area, focused on the key concepts relating to improving the quality of remote working for employers, employees and managers. In particular, the EWL scale composes *organisational trust*, *flexibility*, *work-life interference*, and *productivity*, which dimensions are discussed in greater detail below. Revising and further developing Grant *et al.'s* (2019) scale constitutes the main aim of this paper, as the EWL dimensions' interplay is proposed to provide a greater understanding of the remote e-working experience as a whole.

1.1. The development of the E-Work Life (EWL) scale: An integrated view of the remote e-working experience

Grant *et al.* (2019) presented the EWL scale as a relevant measure to capture the multiple consequences and crucial issues linked to measuring the quality of the remote e-working experience. This scale was developed as a response to both the lack of relevant and robust measures in this area, and a growth in the remote e-working arrangement which resulted from more available and extended use of technologies for work purposes (Grant *et al.*, 2013). The development of the EWL scale was based on collating information gathered from a literature review and relevant qualitative findings by Grant *et al.* (2013), which explored the psychological impact that remote e-working has on individuals. Consequently, as mentioned above, Grant *et al.* (2019) presented a 17-item version of the EWL scale with a four-factor structure including: organisational trust,

flexibility, work-life interference, and productivity. The four EWL factors were significantly linked to individual well-being (i.e., general health mental health and vitality) and reported good reliability as indicated in Factor Determinacy scores (Grant *et al.,* 2019). Also, the EWL scale was designed to be applicable in a variety of organisational contexts, and for all levels within the organisation (i.e., individual, supervisor, and organisational).

The profound importance of the EWL scale lies in the fact that it provides an overall framework of the key areas that are affecting a remote e-workers' life, which allows us to explore the co-existence and interaction of relevant issue. This can, in turn, inform and guide the management and the development of strategies to support individuals' remote e-working experience. Hence, this paper discusses a revision and further validation of the newly devised EWL by Grant *et al.* (2019), which seems to be a very timely and important tool.

1.2. Key areas of the remote e-working experience as indicated by the EWL scale

The first key concept measured by the EWL scale is *organisational trust*, which has been extensively supported by research as a fundamental aspect in the success of remote e-working (Pyöriä, 2011). It has, in particular, been suggested that when remote e-workers felt trusted they experienced very positive emotions (i.e., proud, grateful, and content), whereas they classified distrustful behaviors by managers as challenging (Charalampous *et al.* 2021). In addition, in cases where remote e-workers did not feel trusted, they tend to experience greater levels of guilt, which not only increased the hours they worked but also lessened their detachment from work (Charalampous *et al.,* 2021). Echoing these results, recent qualitative data collected in Italy during the COVID-19 crisis, suggested that managerial control changes took place, with managers monitoring their employees constantly and checking the team's activities multiple times a day (Delfino *et al.*, 2021). Taking into consideration that the level of *'visibility'* and *'presence'* of

employees is lessened, employers and especially managers are called to change the way they manage people by using output-related metrics and trust when evaluating individuals' performance (Felstead *et al.*, 2002). Furthermore, trust can be classified as a resource (as per the JD-R framework) which can act as a buffer against stress that individuals may experience during remote e-working (Hobfoll, 1989).

The second key concept discussed is *flexibility* over the time and location of individuals' work, which has been supported by a vast majority of literature to increase job satisfaction (e.g., Caillier 2012, Chesley, 2010; Messenger and Gschwind, 2016), and individuals' levels of commitment and loyalty (Charalampous *et al.,* 2021). This given flexibility was also supported to increase retention and engagement with the organisation (Richman *et al.*, 2008) as well as employee well-being (Ter Hoeven and Van Zoonen, 2015). Also, flexibility which allowed better dealing with personal and life commitments led to work released tension and decreased emotional exhaustion, which in turn, allowed recovery and recuperation from work (Charalampous *et al.,* 2021). Similarly to organisational trust, flexibility can be considered to be a resource since individuals are allowed to better juggle the demands of their work and personal lives (Kelliher, 2013), which can act as a buffer against stress.

The third pivotal issue concerns the *work life-interference*. Qualitative narratives in Jeffrey *et al.*'s (2004) study expanded on how the time saved from commuting can be used for work, family, and personal matters and commitments, which can in turn reduce work-life conflict. Being able to flex the completion of job tasks allowed in many cases employees to spend more time with their families, continuing work later on in the evening times (Haddock *et al.*, 2006). In contrast, what was found to threaten work-life balance, is the increased permeability of boundaries between work and personal life, something which was heightened even more during COVID-19 both for

working parents who had their family at home with them (Hjálmsdóttir and Bjarnadóttir 2021), or single professionals (Akanji *et al.*, 2020). The modern 'always-on' culture, where individuals need to be contactable 24/7, beyond typical working hours (Derks *et al.*, 2015) can definitely play a role to this conflict and increase the lack of psychological detachment. Examples of boundary breaches between an individual's work and personal life include emailing people outside hours and poor working practices from role models, both of which can be detrimental to individuals' ability to detach from work and switch off (Charalampous *et al.,* 2021). Moreover, technostress experienced by individuals was found to be related to their work-family conflict levels (Molino et *al.*)

Finally, numerous studies have proposed that being able to e-work remotely can be positively associated with productivity (e.g., Gajendran, Harrison, and Delaney-Klinger, 2014, Kossek *et al.*, 2006) one reason being that individuals tend to work longer, on the days they work from home (Kelliher and Anderson, 2010). Filtering interruptions and not being part of the office politics also gave individuals the opportunity to focus more on their work tasks (Fonner and Roloff, 2010). Nevertheless, as Boell *et al.* (2016) highlighted the degree to which remote e-working is effective is inextricably linked to the nature of the work task. For instance, even though remote e-working seems to be more appropriate for activities that require concentration, such as writing, it may be less desirable for teamwork and creative tasks. A new skill that individuals seem to be working on now is their ability to reduce "e-distractions" caused by emails, phone calls and instant messages, with some remote e-workers properly logging off to eliminate "e-noise" (Charalampous *et al.,* 2021). What is worth keeping in mind though is Boell *et al.*'s (2016) suggestion that the degree to which individuals rely on their colleagues to complete a task can also influence how much they will benefit from remote e-working. Also, using technology, which is essential for remote e-working, was found to cause technostress to individuals, which can in turn have a

negative impact on productivity (Tarafdar, Tu, and Ragu-Nathan, 2010). At last, remote e-workers may find it difficult to detach from work, due to being connected 24/7 (Felstead and Henseke, 2017), which can in turn reduce productivity (Fritz *et al.,* 2010).

1.3. The use of the EWL scale in the field

A great level of interest was shown into the EWL scale, which has been already employed by researchers and practitioners in the field. For example, scholars suggested that a positive remote e-working experience as captured within the scale's four dimensions was negatively associated with technostress (i.e., stress due to inability to cope with the demands of organizational computer usage; Tarafdar, Tu and Ragu-Nathan, 2010) and loneliness individuals experienced, and positively linked to their levels of flow while working (Taser *et al.,* 2021). These findings were in line with Grant *et al.*'s (2019) suggestion that a positive remote e-working experience can be linked to improved well-being. Also, a recent study exploring e-Work Self-Efficacy configurations in a remote e-working population identified three different profiles (i.e. Well-adjusted, Unhealthily dedicated, and Distrustful self-shielding), and found significant and meaningful difference in organisational trust, work-life interference, and productivity across these profiles (Tramontano *et al.*, 2021).

1.4. The rationale behind revisiting the 17-item version of the EWL scale.

Notwithstanding the appeal of the EWL scale, a very recent qualitative study using in-depth semi structured interviews within 40 remote e-workers (Charalampous *et al.,* 2021) provided valuable insight into the remote e-working experience, which is what inspired and stimulated the revision of the published EWL scale. Although Charalampous *et al.* (2021) conducted interviews which had primarily focused on remote e-workers' well-being, participants' narratives still discussed all four areas covered by the EWL scale. This further supported the importance of

considering these aspects when evaluating the remote e-workers' experience. Taking into consideration that as the remote e-working arrangement grows, evolves and its use becomes wider throughout the years (Grant, and Russell, 2021; Kelliher, and De Menezes 2019), we can justify the revision and further development of the EWL scale so that it remains up-to-date. Considering that psychologists prefer using short scales in their research to not only reduce respondent time, but also to avoid fatigue (Jebb et *al.* 2021) researchers developed only five items (as described below), which was considered reasonable considering the four-factor solution of the scale.

1.4.1. *Specific amendments to the 17-item version of the EWL scale: Drawing upon the qualitative study*

The original 17-item version of the EWL comprises 3 items measuring organisational trust, 3 items measuring work-related flexibility, 7 items measuring work-life interference, and 4 items measuring productivity. The section below presents these 17 items, but also the newly added or reworded items to the EWL scale, drawing upon the qualitative interviews conducted and presented by the authors (Charalampous *et al.,* 2021). This is expected to allow capturing important issues of the e-work life at a greater depth and in a more holistic way. For instance, the interview data suggested that avoiding micro-management, providing career development opportunities to individuals, and trusting individuals to work more effectively when e-working remotely were suggested to be fundamental indicators of trust within the remote e-working arrangement. In addition, it was proposed that freedom in the location of work and breaking down working hours to suit work and non-work commitments are essential indicators of flexibility. The development of additional items was in line with literature suggesting that a retention of four to six items per construct may be ideal (Hinkin, 1998), and that at least four items are needed to comprise a factor when testing for homogeneity of items (for each construct; Harvey *et al.*, 1985).

Organisational trust

As according to Grant *et al.* (2019) *organisational trust* relates to the way in which the remote e-worker experiences their relationship with their manager. Trust can be a means to urge individuals to be more committed to their organisation and go the extra mile. Table 1 below presents the items included in the original version of the scale, along with three new items added, based on results of author's qualitative study (Charalampous *et al.,* 2021). In particular, the three new items tapped the key elements relating to trust as suggested by the interviewees: micromanaging, professional support, and trust regardless of visibility.

Table 1: Organisational trust dimension revisited

No	Item	Old/ New
1	My organisation provides training in e-working skills and behaviours.	Old
2	I trust my organisation to provide good e-working facilities to allow me to e-work effectively.	Old
3	My organisation trusts me to be effective in my role when I e-work remotely.	Old
4	*My manager does not micro-manage me when e-working remotely.*	*New*
5	*I trust my manager to provide me with career professional developmental opportunities when e-working remotely.*	*New*
6	*When I'm not visible e-working remotely, my manager trusts me to work effectively.*	*New*

Flexibility

The *flexibility* dimension, Grant *et al.* (2019) included items evolving around the when and how work is completed, that is flexing working hours. As highlighted in the interviews conducted, two new items were developed to consider the aspect of flexibility around the location in which work is completed, and the importance of being able to take longer breaks during their typical working hours; for both personal and family reasons, and complete their work hours later on in the day/evening (see Table 2).

Table 2: Flexibility dimension revisited

No	Item	Old/ New
1	My work is so flexible I could easily take time off e-working remotely, if and when I want to.	Old
2	My line manager allows me to flex my hours to meet my needs, providing all the work is completed.	Old
3	My supervisor gives me total control over when and how I get my work completed when e-working.	Old
4	*There are no constraints on the location where I work providing I complete my role effectively.*	*New*
5	*I work flexible hours across the day breaking down my hours to suit my work and non-work commitments.*	*New*

Work-life interference

Out of the seven items constituting this dimension in Grant *et al.*'s (2019) paper, four items were retained (see Table 3 below). Referring back to the interviewees conducted by the authors, two of the seven items were slightly reworded, aiming to be more appealing in their wording. In addition, Item 7 was not semantically aligned with the rest of the items in this dimension. Its reference to *work demands* suggested some shared ground with the Productivity dimension. To avoid interference within dimensions, this item was reworded and moved to the Productivity dimension instead.

Table 3: Work-life interference dimension revisited

No	Item	Old/ Reworded
1.	My e-working does not take up time that I would like to spend with my family/friends or on other non-work activities	Old
2.	When e-working remotely I do not often think about work-related problems outside of my normal working hours	Old
3.	I am happy with my work-life balance when e-working remotely	Old
4.	Constant access to work through e-working is not very tiring	Old
5.	*When e-working from home I do know when to switch off/put work down so that I can rest* **Reworded to:** *When e-working from home I do know when to switch off so that I can recuperate effectively*	*Reworded*

6.	*My social life is poor when e-working remotely* ***Reworded to:*** *My relationships suffer when I am e-working remotely.*	*Reworded*
7.	*I feel that work demands are much higher when I'm e-working remotely*	*Reworded/ Moved to Productivity*

Productivity

As can be displayed in the Table 4, three out of the five items of this dimension remained the same. Item 4 was slightly reworded. Particularly, the reference to *'other family responsibilities'* was deleted to eliminate any similarity with the *work-life interference* dimension. Interviewees' narratives were considered, to ensure that appropriate and meaningful wording was used. Also, as mentioned above, the item *"I feel that work demands are much higher when I am e-working remotely"* was moved from the *work-life interference* dimension to this dimension and was reworded to *"I can cope with work demands more effectively when I e-work remotely".*

A minor alteration that is worth mentioning regarding the entire scale, is that the term *manager* was used to replace terms such as *line manager* and *supervisor* to maintain consistency in items' wording. The aforementioned revision led to an updated 22-item version of the EWL scale which is presented below. Thus, this updated version is examined in Study 1.

Table 4: Productivity dimension revisited

No	Item	Old/ Reworded
1.	When e-working I can concentrate better on my work tasks	Old
2.	E-working makes me more effective to deliver against my key objectives and deliverables	Old
3.	My overall job productivity has increased by my ability to e-work remotely/from home	Old
4.	*If I am interrupted **by family/other responsibilities** whilst e-working from home, I still meet my line manager's quality expectations* ***Reworded to**: If I am interrupted when working from home I still meet my manager's quality expectations*	*Reworded*

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5.	*I can cope with work demands more effectively when I e-work remotely*	*Reworded/ Moved from Work/Life interference*

Study 1

This study aimed to validate the revised 22 – item version of the EWL scale. In particular, a four-factor structure of the scale was assessed, including: *organisational trust, flexibility, work life interference*, and *productivity*.

2. Method

2.1. Procedure

An online cross-sectional survey was used to collect data. A snowball sampling method was employed to disseminate the study within U.K. remote e-workers, with the study advertised through social media (e.g., LinkedIn, Twitter) and researchers' networking contacts.

2.2. Participants

In total, 399 U.K. employees were recruited. Participants had a mean age of 39.80 (SD = 11.93) and 231 (57.9%) of them were female. The three most often reported occupations were information technology (14.8%), teaching and education (14.5%), and other (11.3%). The majority of the participants claimed that they worked additional hours (79.7%). On a 5-point Likert scale ranging from *Never* to *Very frequently /all the time*, individuals indicated highly frequent use of ICT for work purposes; both during normal hours (M = 4.74, SD = .66) and outside hours (M = 4.21, SD = .88). The mean hours individuals e-worked remotely per week were 15.40 (SD = 11.54). The office was the most cited work location (*M hours per week* = 19.01, SD = 14.90), followed by employees' homes (*M hours per week* = 16.80, SD = 36.20).

2.3. Materials/Measures

The updated version of the EWL scale discussed above (i.e., 22-item) was used. Items were measured on a five point Likert scale (from 1 = strongly disagree to 5 = strongly agree).

2.4. Data analyses plan

Data analysis was performed using IBM SPSS Statistics 25 and Mplus 8.0. In particular, descriptive statistics and a preliminary screening for normality of the data were examined using SPSS. Also, CFA using Mplus 8.0 (Muthén and Muthén, 2016) was performed, providing Factor Scores Determinacies to evaluate the reliability of each EWL factor (Tabachnick and Fidell, 2007). Factor Determinacy coefficients have been used as an alternative to Cronbach's alpha in order to measure the internal consistency of the factor solution. Factor Determinacy scores indicate the extent to which the true factor score is measured in the model (Grice, 2001); showing the extent to which the estimated and true factor scores are correlated (Muthén and Muthén, 2016). The criteria for the Factor Determinacy scores are the same as for the Cronbach's alpha; the closer the coefficient is to 1, the better the factor is defined by the observed variables. Tabachnick and Fidell (2007) suggested that a score needs to be $\geq$ .70 to support scale's good internal consistency. In addition, composite reliability was also calculated to test internal consistency, with a score above .70 indicating adequate reliability (Hair *et al.,* 2010). Convergent validity was further evaluated by calculating the Average Variance Extracted (AVE) with a score exceeding .50 being desired (Hair *et al.*, 2010). At last, discriminant validity was evaluated by calculating Maximum Shared Variance (MSV) with values < 0.4 considered acceptable (Hair et al., 2010). Lastly, a four-factor model, as posited by Grant *et al.* (2019), was tested using Mplus.

A set of goodness-of-fit indices was considered to evaluate the factorial solutions. Specifically in order to show a good fit: the (i) chi square test is required to either be non-

significant, or a χ^2:df ratio which is less than 3:1 is needed (Kenny, 2015). The (ii) Comparative

Fit Index (CFI) needs to be above .95 (Vandenberg, and Lance, 2000), but scores above .9 still

indicated adequate fit (Bentler, 1990). The (iii) Root Mean Square Error of Approximation

(RMSEA) needs to be lower than .06 along with a non-significant test of close fit (Steiger, 1990),

with values lower than .08 still showing adequate/mediocre fit (MacCallum, Browne and

Sugawara, 1996). The (iv) Standardised Root Mean Squared Residual (SRMR) has to be lower

than .08 to indicate a good fit (Hu and Bentler, 1999), but a cut-off point of .10 was still suggested

to be appropriate (Garson, 2008). Moreover, as per Tabachnick and Fidell (2013), each factor's

reliability was evaluated using Factor Scores Determinacies, which are interpreted similarly to

Cronbach's alpha.

3. Results

Out of the 22 items, only one slightly deviated from the normal distribution (i.e., Item 2

with kurtosis = 2.87), whereas the rest were normally distributed *(Mean skewness = .66, Mean*

kurtosis = .68). Therefore, CFA was performed using maximum likelihood (ML) parameter

estimates. The descriptive statistics for the EWL scale items are presented in Appendix A,

providing Means, SDs, skewness and kurtosis scores for all 22 items of the EWL scale.

The initial model investigating the 4-factors solution of the 22-item scale did not

adequately fit the data (χ^2 = 740.657, df = 203, *p* < .001, CFI = .88; RMSEA = .08, (C.I.: .075

.088), SRMR = .07). The item loadings showed that the old item EWL1 belonging to the

Organisational trust dimension (i.e., *'My organisation provides training in e-working skills and*

behaviours') was very low (.30) and thus removed (Tabachnick and Fidell, 2007). Once this item

was deleted, the fit improved but was still not adequate (χ^2 = 661.632, df = 183, *p* < .001, CFI =

.89; RMSEA = .081, (C.I.: .074 - .088, *p* <.001; SRMR = .06). When checking the modification

indices the highest value (56.211) was associated with the covariance between the old item EWL7 belonging to the Flexibility dimension (i.e., *'My manager gives me total control over when and how I get my work completed when e-working'*) and the new item EWL6 belonging to the Organisational Trust dimension (i.e., *'When I'm not visible e-working remotely, my manager trusts me to work effectively'*). Considering that these two items belonged to different dimensions (i.e., trust and flexibility respectively) and following guidance suggesting that items should be as clear as possible, reducing any ambiguity that may confuse the respondent (Clark and Watson, 1995) one of the items needed to be excluded. Taking a great look at the item descriptive statistics and factor loadings for both items suggested that the item EWL6 was a stronger item to keep, as it had a higher loading to its corresponding factor (i.e., .83) compared to the item EWL7 (i.e., .77). This deletion provided an adequate fit to the model (χ^2 = 489.915, df =164, p < .001, CFI = .92; RMSEA = .07, (C.I.: .063 - .078, p <.001), SRMR = .06). Four correlated residuals were included in the model, as these were between items belonging to the same dimensions (see Table 5).

Table 5: *Goodness of fit statistics CFA for E-Work Life scale*

Measures	χ^2	Df	CFI	RMSEA	SRMR
22-item version	740.657	203	.88	.08 (.075-.088) p <.001	.07
21-item - Deleting EWL1	661.632	183	.89	.08 (.074 - .088) p <.001	.06
20-item - Deleting EWL1 and EWL7	489.915	164	.92	.07 (.063- .078), p <.001	.06
20-item - Deleting EWL1 and EWL7 and Including 4correlations	373.659	160	.95	.06 (.050 -.066), p =.05	.05

Notes. Correlated residuals were included in the model: EWL4 with EWL6; EWL9 with EWL10; EWL18 with EWL19; EWL21 with EWL22 (see Appendix A for specific items).

Thus, the final 20-item scale led to a good (and improved) fit of the data: $\chi^2 = 399.327$, df = 161; $p < .001$), CFI = .94; RMSEA = .06 (C.I.: .053 -.068, $p = .05$, SRMR = .06). This model reproduces with a good approximation the covariances among the items of the EWL scale, with Factor Determinacies being also very good (*Organisational Trust* = .92, *Flexibility* = .94, *Work Life Interference* = .93, and *Productivity* = .94). Composite reliability scores were good (*Organisational Trust* = .84, *Flexibility* = .85, *Work Life Interference* = .73, and *Productivity* = .88); as well as AVE (*Organisational Trust* = .65, *Flexibility* = .60, *Work Life Interference* = .68, and *Productivity* = .76). Calculating MSV suggested that discriminant validity values were acceptable for Work Life Interference and Productivity but high for Organisational Trust and Flexibility (>0.4; *Organisational Trust* = .44, *Flexibility* = .66, *Work Life Interference* = .18, and *Productivity* = .19).

3.1. Summary

Based on the CFA analyses, two items were removed (i.e., EWL1: *"My organisation provides training in e-working skills and behaviours"*; and EWL7: *"My manager gives me total control over when and how I get my work completed when e-working"*) leading to a final 20 item version of the scale. All four factors of *organisational trust, flexibility, work life interference*, and *productivity* were confirmed (see Appendix A). In order to confirm the factorial structure and the validity of the 20-item EWL scale, and additional study was conducted on an independent sample.

Study 2

This study aimed to provide the final evidence of the factorial structure of the 20-item version of the EWL scale. In particular, a four-factor structure of the scale was assessed, including: *organisational trust, flexibility, work life interference*, and *productivity*. In addition, as per the

aforementioned links made between the EWL dimensions and existing constructs (see section 1.2.) the below hypotheses were checked to explore EWL scale's construct validity:

Hypothesis 1: Organisational trust is expected to positively correlate with positive mental health, and detachment from work; and negatively correlate with technostress.

Hypothesis 2: Flexibility is expected to positively correlate with positive mental health, and detachment from work; and negatively correlate with technostress.

Hypothesis 3: Work life interference is expected to negatively correlate with positive mental health, and detachment from work; and positively correlate with technostress.

Hypothesis 4: Productivity is expected to positively correlate with positive mental health and detachment from work; and negatively correlate with technostress.

4.1. Method

4.2.   Procedure

The same to the previous study's procedure was followed, using an online cross-sectional survey.

4.3.   Participants

In total, 366 U.K. employees were recruited, using a snowballing method. Participants had a mean age of 32.4 ($SD = 10.73$) and 178 (48.6%) of them were female. The three most often reported occupations were information technology (19.9%), business, consulting, and management (12.6%), and other (13.1%). Since the data collection occurred during the COVID-19 pandemic, with individuals mainly working from home, almost half of the sample mentioned that they had no experience with remote e-working before (48.9%). At the moment the data was collected, individuals were in their majority working 5 days a week from home (50.8%) following from four days a week (12.3%) and three days a week (10.7%). Before COVID-19 the majority

worked from home once a week (23.8%), following from two days a week (10.9%) and five days a week (8.2%).

4.4.   Materials/Measures

E-Work Life was measured using the 20-items remained in Study 1, assessing each of four dimensions (organisational trust, flexibility, work-life interference and productivity). Items were rated on a scale from 1 (*Strongly disagree*) to 5 (*Strongly agree*).

Positive mental health was measured using the Short Warwick-Edinburgh Mental Well-being Scale (SWEMWBS) which is a 7-item shortened version of the Warwick-Edinburgh Mental Well-being Scale (WEMWBS; Stewart-Brown *et al.*, 2009). Items were rated on a scale from 1 (*None of the time*) to 5 (*All of the time*). The scale has also been used within an organisational setting (e.g., Gilchrist, Brown, and Montarzino, 2015).

Detaching from work was measured using the detachment rumination subscale, developed by Cropley, Michalianou, Pravettoni, and Millward (2012), which refers to respondent's ability to switch-off, and leave work behind. In this questionnaire respondents have to rate the way they think about work, on a 5- point Likert-scale (from *Very seldom or never* to *Very often or always*).

Technostress was measured using a reduced version of Tarafdar *et al.*'s (2007) technostress creators scale focusing on three dimension specifically: 'techno-overload', 'techno-invasion', and 'techno-complexity'. *'Techno-overload'* refers to cases where technology can increase individuals' workload, forcing them to work at a much faster pace. *'Techno-invasion'* refers to the situations where the technology use creates this expectation that individuals are connected to their work even outside working hours, which then invades personal life. Lastly, *'techno-complexity'* refers to the cases where individuals do not feel competent enough to use technology and handle

their jobs satisfactorily. Individuals were asked to rate on a 5-point Likert scale ranging from *Strongly disagree* to *Strongly agree* how much they agreed with the provided statements.

4.5.   Data analyses plan

Similarly to Study 1, data analysis was performed using IBM SPSS Statistics 25 and Mplus 8.0. Again, descriptive statistics and a preliminary screening for normality of the data were examined using SPSS. Also, CFA using Mplus 8.0 (Muthén and Muthén, 2016) was performed, providing Factor Scores Determinacies to evaluate the reliability of each EWL factor (Tabachnick and Fidell, 2007). The same four-factor model assessed in Study 1, including four correlations was tested using Mplus. The same set of goodness-of-fit indices was considered to evaluate the factorial solutions. In addition, analyses pertaining to evidence of EWL's construct validity were also conducted using SPSS. Construct validity evidence was based on partial correlations between all four EWL dimensions and scores on the measures of positive mental health, detachment from work and technostress creators (i.e. technology overload, technology invasion, technology complexity). The potential confounding effect of gender, experience with remote e-working before COVID-19, frequency of remote e-working during COVID-19 and frequency of remote e-working before COVID-19 was controlled.

5.   Results

All the items were normally distributed *(Mean skewness = .46, Mean kurtosis = .25)*. Therefore, CFA was performed using maximum likelihood (ML) parameter estimates. The descriptive statistics for the EWL scale items are presented in Appendix B, providing Means, SDs, skewness and kurtosis scores for all 20 items of the EWL scale.

CFA was performed to replicate previous findings and to support the final structure of the EWL scale. Thus, the final 20-item scale, including the four dimensions of Organisational Trust,

Flexibility, Work-Life Interference, and Productivity led to a good fit of the data: $\chi^2 = 327.113$, df = 159; $p < .001$), CFI = .94; RMSEA = .05 (C.I.: .053 -.068, p =.22, SRMR = .06). It is worth noting that the four correlations included in Study 1 (see Table 5) were included again. This model reproduces with a good approximation the covariances among the items of the EWL scale, with Factor Determinacies being also very good (*Organisational Trust* = .90, *Flexibility* = .92, *Work-Life Interference* = .92 and *Productivity* = .93). Composite reliability scores were also good (Organisational Trust = .79, Flexibility = .80, Work Life Interference = .72, and Productivity = .86); as well as AVE (*Organisational Trust* = .54, *Flexibility* = .51, *Work Life Interference* = .63, and *Productivity* = .70). Calculating MSV suggested that discriminant validity values were acceptable for all dimensions (>0.4; *Organisational Trust* = .23, *Flexibility* = .23, *Work Life Interference* = .14, and *Productivity* = .20).

Partial correlations were examined to check scale's construct validity (see Table 6). Findings suggested that *work-life interference* negatively correlated with positive mental health (r=-.48, p=.001) and detachment from work (r=-.62, p<.001). It was also positively correlated with technology overload (r=.26, p<.001), technology invasion (r=.43, p<.001)., technology complexity (r=.26, p<.001).

Organisational trust positively correlated with positive mental health (r=-.42, p=.001), detachment from work (r=-.24, p<.001). It was also negatively correlated with technology overload (r=-.15, p<.001), technology invasion (r=-.21, p<.001), technology complexity (r=-.22, p<.001).

Flexibility positively correlated with positive mental health (r=.18, p=.001) and detachment from work (r=.20, p<.001). Regarding technostress creators, flexibility was only negatively correlated with technology complexity (r=-.16, p<.001).

Productivity positively correlated with positive mental health (*r*=-.42, *p*=.001) and detachment from work (*p*=-.23, *p*<.001). It was also negatively correlated with technology overload (*r*=-.14, *p*<.001), technology invasion (*r*=-.18, *p*<.001), technology complexity (*r*=-.16, *p*<.001).

Table 6: Partial correlations examining EWL's construct validity

Control variables	1	2	3	4	5	6	7	8	9
Gender									
Experience with remote e-working before COVID-19									
Frequency of remote e-working during COVID-19									
Frequency of remote e-working before COVID-19									
Outcome variables									
1.PMH	1								
2.DET	.36**	1							
3.T_OVER	-.24**	-.16**	1						
4.T_INV	-.28**	-.36**	.66**	1					
5.T_COMPL	-.25**	-.17**	.46**	.51**	1				
6.TRUST	.42**	.24**	-.15**	-.21**	-.22**	1			
7.FLEX	.18**	.20**	-.03	-.08	-.16**	.48**	1		
8.WLI	-.48**	-.62**	.26**	.43**	.26**	.34**	.23**	1	
9.PROD	.42**	.23**	-.14**	-.18**	-.16**	.31**	.21**	.45**	1

1.PMH=Positive Mental Health, 2.DET= Detachment from work, 3.T_OVER= Technology Overload, 4.T_INV= Technology Invasion, 5.T_COMPL= Technology Complexity, 6.TRUST= Organisational Trust, 7.FLEX = Flexibility, 8.WLI = Work-Life Interference, 9.PROD=Productivity

5.1. Summary

Thus, the CFA analyses supported the final 20 item version of the scale, confirming its four factors of Organisational trust (5 items), Flexibility(4 items), Work-Life Interference (6 items), and Productivity (5 items) were confirmed (see Appendix B). The significant correlations found between the EWL scale's dimensions and positive mental health, detachment from work, and technostress supported scale's construct validity; as well as Factor Determinacies scores supported its reliability.

6. Discussion

6.1. Key findings

The present study updates and provides a revision and further validation of the E-Work Life scale (EWL; Grant *et al.*, 2019) which can be utilised to measure and monitor the quality of an individuals' remote e-working experience. The original version of the EWL scale (Grant *et al.*, 2019) was expanded, based upon the results of a qualitative study conducted by the authors (Charalampous *et al.,* 2021). For example, these qualitative findings expanded on breaches of trust when e-working remotely, as a result of micro-managing employees who are not 'visible'. Findings also supported the importance of trusting that the employer will provide adequate career professional development opportunities to individuals working outside the typical working environment. In addition, when discussing flexibility provided by remote e-working, being able to work from different locations was discussed, as well as individuals' choice to breaking down their hours in the day to suit their work and non-work commitments. Hence, these were considered to be important elements to add to the existing version of the EWL scale.

Consequently, the current paper provides a revision and further validation and support for a final 20-item version of the scale, this was based on two further quantitative studies detailed in this paper. More precisely, we were led to the final 20-item version of the EWL scale, following CFA was performed in Study 1 suggesting the exclusion of two of the additional/reworded items. This version of the EWL scale which, similarly to Grant *et al.* (2019), showed a four-factor structure and included the dimensions of: *Organisational Trus*t (5 items), *Flexibility* (4 items), *Work-Life Interference* (6 items), and *Productivity* (5 items). Then, CFA performed in a different sample in Study 2, confirmed this final 20-item structure. Hence, it can be argued that the amendments made to the scale, which were inspired and guided by more recent and relevant

interviews within remote e-workers (Charalampous *et al.,* 2021), provide an improved version of the scale which captures the remote e-working experience in a more accurate and holistic way.

Findings also supported significant relationships between each of the four EWL dimensions and remote e-worker's positive mental health, detachment from work and technostress levels. These results not only confirm the scale's construct and discriminant validity but also offer valuable contributions to the existing literature of remote e-working. More precisely, the higher levels of organisational trust, greater flexibility, and increased productivity remote e-workers experienced, the more likely they were to experience greater levels of positive mental health, detachment from work, and less technostress levels. This denotes that if remote e-working is perceived as a positive working experience during which (a) the individuals feel trusted to work even if they are "out of sight", (b) they are given the flexibility to stretch their hours, location and take time out for non-commitments as well as (c) they are productive while e-working remotely, then the better is their self-reported mental health, detachment from work and technostress levels and vice versa. These findings mirror previous suggestions which suggest that a link between a positive experience of remote e-working and employees' enhanced well-being (Grant *et al.*, 2019; Taser *et al.*. 2021). They also bring in the discussion how remote e-workers can avoid becoming susceptible to experiencing technostress when their e-work life spheres flourish, which can in turn alleviate the negatives consequences that come with it (Salanova, 2020).

In contrast, when individuals report that remote e-working interferes with their non-working life, the worse their self-reported mental health and detachment from work. This is in line with findings suggesting that individuals often find it challenging to keep clear boundaries between work and non-work (Ramarajan and Reid, 2013), which can in turn have implications on recovery processes and wellbeing (Schlachter *et al.*, 2018). Moreover, work-life interference

was supported to be associated with greater levels of technostress, due to technology's complexity, invasion character, and overload. This is in line with literature suggesting a negative link between technostress and work life balance/interference (Atanasoff, and Venable, 2017; Ma, Ollier-Malaterre, and Lu, 2021).

6.2. Theoretical and Practical applications

The discussed findings have significant theoretical value, as they support the interplay between all four characteristics of the remote e-working experience (as outlined by the EWL scale) and workers' positive mental health, detachment from work, and technostress. Therefore, academics and practitioners have evidence for a multi-dimensional measure, such as the EWL scale, which can be used to explore pivotal issues linked to the remote e-working experience.

Our findings also have practical significance as they contribute to and expand on conversations discussing the effectiveness and best implementation of remote e-working practices, in a world of work that is embracing a progressively hybrid and agile way of working. The use of the EWL scale and the measurement of the remote e-working experience in its whole can benefit employers, Human Resource (HR) professionals, managers, and individuals. From an organisational perspective, it is pivotal that a culture of organisational trust is established and promoted where individuals build rapport and create bonds with their superiors and colleagues. This level of trust is necessary so remote e-workers feel more comfortable to stop working and switch-off, without feeling guilty that people will question their engagement and loyalty levels (see Tietze, 2002; Tietze and Musson, 2005). This will, in turn, benefit remote e-workers' well-being. Although trust has been an extensively discussed issue within the remote e-working literature (Felstead *et al.*, 2002; Owens and Khazanchi, 2018) it may be more challenging nowadays considering the large amount of time individuals spend working apart, and the absence

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of important physical interpersonal cues. In addition, building on individuals' perceptions of productivity when e-working remotely seems to also be fundamental, as it might consequently impact on their well-being. To enable individuals work at their best, it is worth acknowledging recent literature discussing optimal new knowledge, skills, and competencies that remote e-workers need, as well as ways the beneficial role of increasing their self-efficacy levels (Tramontano *et al.*, 2021). Finally, organisations should prioritise enabling balance between the work and personal spheres, reducing any negative interference. Occupational psychologists have recently been discussing about the likelihood of a "hybrid hangover" whereby individuals feel mentally exhausted from switching back and forth between remote e-working and being in the office and the permeability of boundaries may need greater consideration than ever (Banning-Lover, 2021).

6.3. Limitations and future research

This research comes with several limitations that are worth acknowledging. These limitations can in some cases be counterbalanced by the strengths of the current research, and in others may demand future research to fill these gaps. First, the cross-sectional character of the quantitative studies obstructs the identification of causal relationships between the EWL scale and existing validated measures. Future longitudinal studies can meet this need, as well as assessing theoretical models can enable researchers to also recommend potential mechanisms underpinning the relationship between remote e-working and organisational trust, flexibility, work-life interference, and productivity at work. Longitudinal invariance would also prove test-retest reliability for the EWL scale. Furthermore, although these studies supported the sound psychometric properties of the EWL scale, the development and validation of a scale is considered to be an ongoing process, going beyond the initial item development (Comrey, 1988; Nunnally,

1978). Given that the phenomenon of remote e-working has seen growth in different countries around the world (Eurofound and the ILO, 2017), it is important to test the validity of the newly devised EWL scale in diverse samples and across cultural groups (DeVellis, 2016). Cross-national validation of scales is a common practice within the organisational psychology field (for an example see the Italian version of the Utrecht Work Engagement Scale by Balducci, Fraccaroli, and Schaufeli, 2010), and it could be a warranted next step to EWL's further development.

6.4. Conclusions

Especially after COVID-19, remote e-working has gained an even greater amount of interest from both researchers and practitioners who are continuously discussing the best ways of implementing remote e-working effectively. The results of this study support a 20-item version of the EWL which seems to be a timely addition when measuring the remote e-working experience in its whole. Also, the discussion around remote e-working continues and further develops as technological advances such as the creation of virtual metaverses will lead to a remote working experience which is 3D and more interactive/experiential. This even increases the likelihood that remote e-working might be here to stay as a working style. It therefore, becomes very important to ensure that the outlined areas by the EWL scale (i.e., organisational trust, flexibility, work-life interference, and productivity) are given the required attention. This will, in turn, ensure that remote e-workers not only are satisfied and effective but they also enjoy experience an improvement to their well-being at work. Last but not least, the EWL scale demonstrates solid theoretical foundations and provides a clear agenda, based on which organisations can initiate meaningful conversations in order to improve best remote e-working practices and inform organisational policy.

Appendix A: E-Work-Life scale: Items descriptive statistics, factor loadings and factor correlations for the initial and final 4-factor solutions

Items		Descriptive Statistics				Initial 4-factor solution**				Final 4-factor solution			
		Mean	SD	Sk.	Kur.	F1	F2	F3	F4	F1	F2	F3	F4
EWL1	1. My organisation provides training in e-working skills and behaviours	3.04	1.24	.09	-1.11	.30				Removed			
EWL2	2. My organisation trusts me to be effective in my role when I e-work remotely	1.85	.97	1.62	2.83	.77				.80			
EWL3	3. I trust my organisation to provide good e-working facilities to allow me to e-work effectively	2.30	1.07	.71	-.05	.65				.70			
EWL4	4. My manager does not micro-manage me when e-working remotely	1.90	1.04	1.26	1.18	.75				.66			
EWL5	5. I trust my manager to provide me with career professional developmental opportunities when e-working remotely	2.47	1.07	.54	-.22	.66				.68			
EWL6	6. When I'm not visible e-working remotely, my manager trusts me to work effectively	1.88	.99	1.31	1.53	.83				.75			
EWL7	7. My manager gives me total control over when and how I get my work completed when e-working	2.13	1.13	.98	.30		.77			Removed			
EWL8	8. My work is so flexible I could easily take time off e-working remotely, if and when I want to	2.57	1.23	.36	-.88		.74				.77		
EWL9	9. My manager allows me to flex my hours to meet my needs, providing all the work is completed	2.26	1.18	.82	-.16		86				.84		

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Code	Item	M	SD	Skew	Kurt							
EWL10	10. There are no constraints on the location where I work providing I complete my role effectively	2.44	1.26	.54	-.84		73				.74		
EWL11	11. I work flexible hours across the day breaking down my hours to suit my work and non-work commitments	2.67	1.24	.26	-1.03		.71				.75		
EWL12	12. My e-working does not take up time that I would like to spend with my family/friends or on other non-work activities	2.52	1.07	.41	-.64			.70			.70		
EWL13	13. When e-working remotely I do not often think about work-related problems outside of my normal working hours	2.88	1.14	.03	-1.07			.68			.68		
EWL14	14. I am happy with my work life balance when e-working remotely	2.27	1.05	.71	-.07			.82			.83		
EWL15	15. Constant access to work through e-working is not very tiring	2.80	1.09	.07	-.87			.67			.67		
EWL16	16. When e-working from home I do know when to switch off so that I can recuperate effectively	2.47	1.09	.50	-.58			.61			.61		
EWL17	17. My relationships suffer when I am e-working remotely*	3.74	1.07	-.67	-.31			-.49			-.49		
EWL18	18. When e-working I can concentrate better on my work tasks	2.18	.96	.66	.07				.75				.72
EWL19	19. E-working makes me more effective to deliver against my key objectives and deliverables	2.15	.94	.64	.02				.87				.86
EWL20	20. If I am interrupted when working from home I still meet my manager's quality expectations	1.97	.82	.82	.79				.60				.60

EWL21	21. My overall job productivity has increased by my ability to e-work remotely/from home	2.08	.95	.75	.216				.83					.81
EWORK22	22. I can cope with work demands more effectively when I e-work remotely	2.09	.96	.69	-.021				.89					.88

Factor correlations

	F1	F2	F3	F4
F1	1.00			
F2	.66**	1.00		
F3	-.43**	-.34**	1.00	
F4	.34**	.33**	-.44**	1.00

Note: Sk.=skewness; Kur.=kurtosis
*items that are reverse scored.
**Correlations are significant at the 0.01 level.
***The Factors are named:
F1 = Organisational Trust, 5 items
F2 = Flexibility, 4 items
F3 = Work-Life Interference, 6 items
F4 = Productivity, 5 items

Appendix B: E-Work-Life scale: Items descriptive statistics, factor loadings and factor correlations for the final revised measure.

Items		Descriptive Statistics				Final 4-factor solution			
		Mean	SD	Sk.	Kur.	F1	F2	F3	F4
EWL1	My organisation trusts me to be effective in my role when I e-work remotely	.81	.72	.79	.82	.79			
EWL2	I trust my organisation to provide good e-working facilities to allow me to e-work effectively	1.16	.97	.82	.30	.50			
EWL3	My manager does not micro-manage me when e-working remotely	1.09	1.00	.66	-.20	.62			
EWL4	I trust my manager to provide me with career professional developmental opportunities when e-working remotely	1.51	1.09	.46	-.39	.58			
EWL5	When I'm not visible e-working remotely, my manager trusts me to work effectively	1.02	.91	.91	.82	.75			
EWL6	My work is so flexible I could easily take time off e-working remotely, if and when I want to	1.46	1.14	.43	-.59		.65		
EWL7	My manager allows me to flex my hours to meet my needs, providing all the work is completed	1.21	1.11	.83	.01		.82		
EWL8	There are no constraints on the location where I work providing I complete my role effectively	1.09	1.04	.93	.36		.64		

EWL9	I work flexible hours across the day breaking down my hours to suit my work and non-work commitments	1.55	1.23	.44	-.83		.73		
EWL10	My e-working does not take up time that I would like to spend with my family/friends or on other non-work activities	1.57	1.05	.33	-.76			.64	
EWL11	When e-working remotely I do not often think about work-related problems outside of my normal working hours	1.87	1.09	-.01	-.93			.65	
EWL12	I am happy with my work life balance when e-working remotely	1.41	1.06	.55	-.41			.82	
EWL13	Constant access to work through e-working is not very tiring	1.89	1.06	.00	-.83			.66	
EWL14	When e-working from home I do know when to switch off so that I can recuperate effectively	1.62	1.07	.27	-.57			.62	
EWL15	My relationships suffer when I am e-working remotely*	2.56	1.14	-.40	-.80			-.42	
EWL16	When e-working I can concentrate better on my work tasks	1.63	1.06	.33	-.46				.75
EWL17	E-working makes me more effective to deliver against my key objectives and deliverables	1.60	1.03	.35	-.28				.84
EWL18	If I am interrupted when working from home I still meet my manager's quality expectations	1.19	.89	.76	.64				.48
EWL19	My overall job productivity has increased by my ability to e-work remotely/from home	1.54	1.04	.24	-.53				.75
EWL20	I can cope with work demands more effectively when I e-work remotely	1.45	1.03	.45	-.31				.81

Factor correlations				
F1	1.00			
F2	.48**	1.00		
F3	-.34**	-.37**	1.00	
F4	.32**	.23**	-.45**	1.00

Note: Sk.=skewness; Kur.=kurtosis
*items that are reverse scored.
**Correlations are significant at the 0.01 level.
***The Factors are named:
F1 = Organisational Trust, 5 items
F2 = Flexibility, 4 items
F3 = Work-Life Interference, 6 items
F4 = Productivity, 5 items

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