

Routledge
Taylor & Francis Group

Work & Stress

An International Journal of Work, Health & Organisations

ISSN: 0267-8373 (Print) 1464-5335 (Online) Journal homepage: www.tandfonline.com/journals/twst20

The work-family interface and psychological recovery from work: a meta-analysis on two intertwined topics

Ana Isabel Sanz-Vergel, Alejandro Díaz-Guerra, Alfredo Rodriguez-Muñoz & Mirko Antino

To cite this article: Ana Isabel Sanz-Vergel, Alejandro Díaz-Guerra, Alfredo Rodriguez-Muñoz & Mirko Antino (19 Nov 2026): The work-family interface and psychological recovery from work: a meta-analysis on two intertwined topics, Work & Stress, DOI: 10.1080/02678373.2026.2765834

To link to this article: https://doi.org/10.1080/02678373.2026.2765834

© 2026 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group

Published online: 19 Nov 2026.

Submit your article to this journal

View related articles

View Crossmark data

Full Terms & Conditions of access and use can be found at
https://www.tandfonline.com/action/journalInformation?journalCode=twst20

WORK & STRESS
https://doi.org/10.1080/02678373.2026.2765834

Routledge
Taylor & Francis Group

REVIEW ARTICLE

OPEN ACCESS Check for updates

The work-family interface and psychological recovery from work: a meta-analysis on two intertwined topics

Ana Isabel Sanz-Vergel[a], Alejandro Díaz-Guerra[b], Alfredo Rodriguez-Muñoz[b] and Mirko Antino[b]

[a]Norwich Business School, University of East Anglia, Norwich, United Kingdom; [b]Faculty of Psychology, Complutense University of Madrid, Madrid, Spain

ABSTRACT

The work-family interface and psychological recovery from work remained as two parallel topics for many years until scholars started to acknowledge that they are intertwined. In the present study, we advance knowledge on the field by carrying out the first meta-analysis on this topic. A total of 71 studies conducted across the globe were included. We explored whether all types of work-family interaction relate to recovery, and whether the strength of the relationships varies depending on type of recovery. Our findings show that three forms of work-family interaction are significantly related to recovery, namely work-family conflict (WFC), family-work conflict (FWC) and work-family facilitation (WFF). In the case of WFF, the strength of this relationship varies depending on how recovery is conceptualised. For instance, the association is particularly strong when recovery is defined in terms of perceived control over leisure time. From all types of work-family interaction, WFC is the most widely measured, whereas from all forms of recovery, psychological detachment from work seems the most popular. Although recovery has been considered a dynamic process, most of the identified studies are cross-sectional. Based on our results, we identify gaps and present a resource-based theoretical model to guide future research and practice.

ARTICLE HISTORY
Received 28 August 2025
Accepted 20 September 2026

KEYWORDS
Work-family interface; recovery from work; resources; meta-analysis

The field of occupational and organisational psychology is concerned not only with employees' experiences at work, but also with how employees feel and behave during non-work time. Recovering from work-related effort is crucial so that psycho-physiological systems return to pre-stressors levels, avoiding the development of chronic diseases (Geurts & Sonnentag, 2006). The ability to recover may be impaired when work and family are mutually incompatible, in other words, when work-family conflict (WFC) arises (Greenhaus & Beutell, 1985). As both WFC and inadequate recovery have significant implications for employee health and well-being, understanding how these two

CONTACT Ana Isabel a.sanz-vergel@uea.ac.uk

© 2026 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group
This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent.

phenomena are related is essential for advancing theory and informing organisational interventions.

Despite the link between the two topics is obvious (Sonnentag et al., 2015), these two streams of research have greatly remained as parallel topics. For example, meta-analyses on work-family experiences have focused on exploring its association with strain, overlooking its relationship with psychological recovery (Amstad et al., 2011; Michel et al., 2011; Nohe et al., 2015). Meta-analyses on psychological recovery do not shed much light either, as they neglect the role of work-family as an important trigger of impaired recovery (Steed et al., 2021).

Although some studies have acknowledged that these two research areas are intertwined (e.g. Molino et al., 2015; Sanz-Vergel et al., 2010), the current body of research in this field presents a fragmented and inconsistent picture. At the moment, there is not a systematic analysis of how these two phenomena relate to each other. By synthesising all relevant constructs within a unified statistical framework, we aim to provide a more comprehensive understanding of the strength and nature of these relationships. This can translate into more evidence-based conceptual models and tailored organisational interventions.

In this work, we make three important contributions to the literature. First, we conduct the first meta-analysis that integrates two central topics in occupational and organisational psychology. This allows us to provide a comprehensive overview of the current state of research in this rapidly growing field. Specifically, we determine which form of work–family interaction (i.e. negative vs. positive) is more strongly related to psychological recovery from work. Moreover, while it is well established that work can influence family life, the reverse is also true – that family demands and experiences can shape the work domain (Frone et al., 1997; Greenhaus & Beutell, 1985). Although the family-to-work direction has historically received far less scholarly attention, we also examine this neglected pathway by assessing which direction of influence (i.e. family-to-work vs. work-to-family) shows a stronger association with psychological recovery.

Second, we contribute to the existing evidence base by examining whether the strength of these relationships varies depending on the type of recovery (e.g. recovery state vs recovery experiences). Existing research so far is fragmented (e.g. focused on one form of work-family or one form of recovery, see Headrick et al., 2023). A systematic analysis will provide a detailed picture on where research in this growing field currently stands. Understanding these differential relationships can support the design of targeted interventions (Sonnentag et al., 2017) and help ensure that appropriate organisational policies are implemented before chronic health conditions develop among employees. For example, if WFC (a form of work–family interaction) and lack of psychological detachment (a widely examined recovery experience) show a particularly strong association, the first stage of an intervention should focus on providing employees with opportunities to mentally disconnect from work.

Third, by looking at the current state of the art, we will identify existing gaps that can guide future research and practice. Our work will be informative per se, as we will provide specific data on what types of concepts and measures are most commonly included in the studies, as well as on what type of designs are most frequently used. Our findings can encourage scholars to replicate existing findings, examine new

conceptual models that have been overlooked so far, and use research designs that allow for alternative interpretations of the current evidence. We also advance the literature by offering a resource-based perspective on the relationship between the work–family interface and psychological recovery from work. In doing so, we develop a theoretical framework to guide future research and identify resource-based theories that may be fruitfully applied to these two phenomena.

Theoretical framework and research questions

Definition of concepts

The work-family interface comprises several concepts (please see Table 1 for definitions) that mainly reflect either the quality of the relationship between the two domains (i.e. negative/positive) or the direction of influence (i.e. work-to-family or family-to work) (Geurts et al., 2005). From all the existing constructs, the most widely analysed has been WFC. The positive synergy between work and family is mainly reflected in the concept of work-family facilitation (WFF), although other terms such as work-family enrichment (WFE) have been used interchangeably. Some scholars have also used the concept of work-life balance (WLB) to capture a positive synergy between work and life domains. For clarity purposes, from now on, we will use the term WFC to refer

Table 1. Definitions of concepts.

Key concepts	Definitions
Work-family conflict/Family work-conflict	A form of interrole conflict in which the role pressures from the work and family domains are mutually incompatible in some respect (Greenhaus & Beutell, 1985, p. 77). In work-family conflict, work aspects interfere with family aspects (e.g. work overload leaves little time to spend with family). In family-work conflict, family demands negatively affect work (e.g. being interrupted while working because a family member becomes ill).
Work-family facilitation /Family-work facilitation	The extent to which an individual's engagement in one life domain "(i.e. work) provides gains (i.e. developmental, affective, capital, or efficiency) which contribute to enhanced functioning of another life domain (i.e. family)" (Wayne et al., 2007, p. 64). Same applies to the family-work direction (i.e. engagement in family life enhances functioning in the work domain).
Work-life balance	An overall level of contentment resulting from an assessment of one's degree of success at meeting work and family role demands (Valcour, 2007, p. 1512).
Recovery as an outcome (recovery state)	Feeling physically and mentally refreshed and to be full of energy (Sonnentag & Kruel, 2006).
Recovery as a process (activities and experiences)	Recovery activities: What people do during nonwork time, that is, what kind of activity they are pursuing (Sonnentag et al., 2022) Recovery Experiences: The underlying psychological experiences associated with recovery (Sonnentag & Fritz, 2007). Four recovery experiences have been identified: • Psychological detachment from work: individual's sense of being away from the work situation (Etzion et al., 1998, p. 579). • Relaxation: a state of low activation and increased positive affect (Stone et al., 1995) • Mastery experiences: off-job activities that distract from the job by providing challenging experiences and learning opportunities in other domains (Sonnentag & Fritz, 2007, p. 206). • Control over leisure time: the degree to which a person can decide which activity to pursue during leisure time, as well as when and how to pursue this activity (Sonnentag & Fritz, 2007, p. 207).
Recovery opportunities	The possibility, in terms of available time, to engage in activities that facilitate the psychological experience of recovery (Rodríguez-Muñoz et al., 2012, p. 86).

specifically to negative interactions between work and family, and the term WFF to denote positive interactions between these domains.

Different conceptualizations and measures have also been used in the field of recovery (please see Table 1). To provide clarity on this, Sonnentag and Geurts (2009) distinguished between recovery as an outcome, recovery as a process, and recovery setting. While recovery as an outcome is defined as a person's affective state after a break, recovery as a process encompasses the mechanisms underlying the recovery phenomenon. This latter category includes off-job activities that are assumed to support the recovery process (i.e. hobbies) as well as the psychological experiences attached to these activities (i.e. recovery experiences). Sonnentag and Fritz (2007) identified four such experiences: psychological detachment from work (i.e. mentally disconnecting from work), relaxation (i.e. low activation), mastery experiences (i.e. challenging experiences), and control over leisure time (i.e. deciding when and which activity to pursue during leisure time). Finally, recovery setting refers to the domain where recovery takes place (i.e. at work vs outside work). It is important to note that, in the present meta-analysis, with the exception of two studies, all studies focus on recovery outside work. A small number of studies developed their own measures of recovery, all of them capturing the extent to which individuals had the opportunity to find time to recover (recovery opportunities). Also, all of them conceptualised recovery in psychological rather than physiological terms or biomarkers. For brevity, throughout the manuscript we use the terms "psychological recovery" and "recovery" interchangeably.

The relationship between the work-family interface and psychological recovery

The link between the work-family interface and recovery literatures can be theoretically explained trough a resource-based perspective. The Conservation of Resources Theory (COR) developed by Hobfoll (1989) has been considered one of the most appropriate frameworks to understand work-family dynamics (Grandey & Cropanzano, 1999) and to explain the recovery process (Xanthopoulou et al., 2014). According to COR theory, stress arises when individuals anticipate or actually experience a resource loss. Resources can be "objects" (e.g. house, car) and "conditions" (e.g. seniority) but also personal characteristics (e.g. self-efficacy) or "energies" (e.g. vitality). Key corollaries of this theory focus on the idea of resource loss and resource gain (Hobfoll, 2001). Resource loss affects people very rapidly and makes them more prone to further resource loss. A lack of resource reservoir prevents individuals from investing resources in order to acquire more resources. On the other hand, those who possess resources are more likely to gain new resources and are less vulnerable to resource loss.

COR theory (Hobfoll, 2001) can be applied to understand how the work–family interface and recovery are interconnected, as noted by several scholars. For example, Amstad and Semmer (2009) position recovery as a crucial micro-process shaping the dynamic interplay between work and non-work domains. They argue that the recovery process is essential for restoring depleted resources, and the experience of WFC undermines this process. This would be in line with the resource loss corollary of COR theory, which says that an initial loss of resources (i.e. WFC) generates further resource loss (i.e. lack of recovery). Moreover, WFC can be conceptualised as a stressor (Greenhaus & Beutell, 1985; Voydanoff, 2005), and as such, according to the stressor–detachment

model (Sonnentag & Fritz, 2015), it may hamper individuals' ability to mentally disengage from work during non-work hours. Blurred boundaries between work and family domains hinder recovery, as individuals remain cognitively or emotionally preoccupied with work outside working time (Sonnentag et al., 2015).

The experience of WFC drains resources that would otherwise be restored through low-effort strategies, such as psychological detachment and relaxation (Sonnentag & Fritz, 2007). In line with this, research in this area highlights both detachment and relaxation as central recovery experiences that are particularly impaired by WFC-related strain (e.g. Moreno-Jiménez et al., 2009; Sousa & Silva, 2025). Therefore, from both theoretical and empirical standpoints, WFC should show the strongest associations with psychological detachment and relaxation – diversionary strategies that rely on shutting down cognitive and physiological activation – compared to other recovery dimensions, such as mastery or control.

In contrast, the Work–Home Resources model (Ten Brummelhuis & Bakker, 2012) highlights the potential for positive cross-domain processes. Building on COR theory (Hobfoll, 2001), this model proposes that the work and home domains are connected through resources (e.g. energy, time) which may be either depleted or accumulated over time. From this perspective, WFF reflects a resource gain process, whereby resources generated at work enhance functioning in the home domain. For example, Ten Brummelhuis and Bakker refer to higher quality care tasks, greater availability at home, and enhanced wellbeing. This is also consistent with COR's notion of gain cycles – an initial pool of resources may facilitate further resource gains over time. We argue that the resources generated through WFF (i.e. time, energy) allow individuals to invest in recovery, particularly in experiences that require active engagement, namely mastery-oriented strategies as defined by Sonnentag and Fritz (i.e. mastery and control).

Importantly, the theoretical distinction between loss- and gain-based processes also implies that not all forms of recovery are equally relevant for understanding the work–family interface. In their review, Demerouti et al. (2013) explicitly acknowledge differences between recovery types and emphasise that these distinctions shape the nature of cross-domain synergies between work and non-work. In line with this view, we consider it essential to distinguish between specific recovery types and therefore examine each form of recovery separately in our analyses. By doing so, we aim to bring greater clarity to the field, particularly in light of the mixed findings reported in previous research, where studies found different and inconsistent strength of the relationships between WFC and recovery (Derks & Bakker, 2014; Headrick et al., 2023; Molino et al., 2015).

Although these studies provide good insights, they did not examine the complete nomological network of the relationships between the work-family interface and psychological recovery from work. To date, no meta-analysis has considered all types of work–family interaction and all types of recovery within the same study. Given this lack of integrative evidence, we begin with an exploratory approach, formulating broad research questions aimed at mapping the overall pattern, direction, and magnitude of the relationships between the work–family interface and recovery.

Research Question 1: Are all types of work-family interaction related to psychological recovery and what is the magnitude and direction of the effects?

Research Question 2: Are some types of work-family interaction more strongly related to specific forms of psychological recovery than others?

Building on these exploratory questions, and guided by previously mentioned empirical and theoretical work, we then articulate more specific hypotheses regarding the direction of the observed associations. We also provide targeted hypotheses concerning recovery experiences, as the majority of existing evidence focuses on this form of recovery. Please note that this directional framing serves conceptual clarity, whereas our meta-analytic estimates remain correlational and do not imply causality.

Hypothesis 1: Work–family conflict (WFC and FWC) will be negatively associated with psychological recovery.

Hypothesis 2: Work–family facilitation (WFF and FWF) will be positively associated with psychological recovery.

Hypothesis 3: WFC/FWC will show strongest relations with diversionary strategies (i.e. detachment and relaxation)

Hypothesis 4: WFF/FWF will show strongest relations with mastery-oriented strategies (i.e. control over leisure time and mastery experiences)

Method

Selection of studies

In April 2025, we conducted a comprehensive literature review of primary studies. This included both published and unpublished works, such as articles, book chapters, and institutional reports. The search covered materials available before 2025. It was carried out using the Scopus, Medline, ProQuest, PubMed, and PsycINFO databases, following PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Page et al., 2021).

We used the following search query, adapting it to fit the specific format required by each database: "work-family conflict" OR "work-family interference" OR "work-family enrichment" OR "work-family facilitation" OR "work-life balance" OR "work-life conflict" OR "work-life interference" OR "work-life enrichment" OR "work-life facilitation" (these are just some examples, the complete search query for work-family interaction can be shared upon request) AND ("recovery experiences" OR "recovery" OR "psychological detachment from work"). Duplicates were removed using Zotero 6.0.36 (Corporation for Digital Scholarship, 2023), an open-source reference manager. Afterward, the second and third authors independently screened the records based on their titles and abstracts. Those records that passed this screening were then reviewed by the first three authors. Consensus on article inclusion was reached through discussion if necessary. Specifically, studies had to meet the following criteria in order to be included in the meta-analysis:

Work-family interaction conceptualisation

Studies must include a measure of work-family interaction, whether it is positive (e.g. WFF) or negative (e.g. WFC), and regardless of whether the interaction originates from work (e.g. WFC) or family (e.g. FWC).

Focus of recovery

In line with Steed et al. (2021), we were interested in all types of recovery (i.e. recovery as an outcome, as a process, recovery at work, and recovery outside work). Other concepts cannot be considered as recovery *per se* and overlap with categories that fall outside the scope of this study. For example, off-job activities, affective rumination and problem-solving pondering, have been classified as antecedents of recovery, rather than recovery itself (Sonnentag & Fritz, 2007, 2015). In addition, the concept "need for recovery" is considered a proxy for fatigue and should therefore be excluded as a measure of recovery (Demerouti et al., 2009).

Effect size information

Studies must include at least one effect size (e.g. correlation coefficient) between a measure of work-family interaction and a measure of recovery, or provide enough information to calculate the effect size.

Study language

Only studies published in English or Spanish were included.

Meta-analytic strategy

Effect size index

We used the Pearson correlation coefficient (r) as the basic effect size for our meta-analysis, given the correlational nature of all the included studies. For longitudinal studies, we used cross-sectional correlations derived from measurements taken at the same time point (e.g. T1 and T2). In cross-lagged panel studies, we utilised the only available correlation (e.g. between T1 and T2). For diary studies, we applied between-level correlations.

For the statistical analyses, we first corrected each correlation coefficient for unreliability in both the work-family interface and recovery measures, allowing our results to be comparable to those of Headrick et al. (2023), who applied the same approach. When reliability estimates were not reported for multi-item scales, we used the mean reliability for that construct. In contrast, single-item measures were assumed to have perfect reliability, as a conservative strategy for estimating corrected correlations. Second, we transformed corrected correlation coefficients (ρ) into Fisher's Z because the variance of a correlation depends on its size (Borenstein & Hedges, 2019). We then converted the results back to correlation coefficients to make interpretation easier.

Meta-analytic approach

Several studies allowed us to code multiple effect sizes by providing various measures of work-family interaction, recovery, and/or different time points. On the one hand, some of these effect sizes correspond to distinct theoretical relationships. For example, the study by Lapierre et al. (2012) provides insights into the relationship between WFC and recovery, as well as between FWC and recovery. These two relationships should be meta-analysed separately, as they are theoretically distinct. Accordingly, we estimated four distinct meta-analytic models, each corresponding to one type of work-family

interaction: WFC, FWC, WFF, and FWF, each in relation to recovery. Moreover, we consider different recovery dimensions together in a single meta-analysis, rather than estimating a meta-analytic model for each dimension separately. In that way, we were able to statistically test the differences between every pair of recovery dimensions.

On the other hand, it is important to note that some studies report multiple effect sizes for the same relationship. For example, the abovementioned study by Lapierre et al. (2012) measures two different dimensions of recovery – psychological detachment and relaxation – thereby providing two measures of the same theoretical relationship, which should be meta-analysed together. This introduces statistical dependence among effect sizes extracted from the same study, as they are derived from the same sample and/or share methodological similarities. Failing to account for this dependence can lead to inflated Type I error rates.

To appropriately address this issue, we employed a three-level meta-analytic model (Van den Noortgate et al., 2013). This modelling approach accounts for the nested structure of the data by partitioning the total variance into three components: variance due to sampling error (sampling variance), variance among effect sizes within the same study (within-study variance), and variance between studies (between-study variance). Specifically, sampling variance was estimated in advance and treated as known. This allowed us to apply inverse-variance weighting, giving greater influence to studies with larger sample sizes. Additionally, following recent recommendations (Fernández-Castilla et al., 2021), we applied robust standard error corrections to the estimates from the three-level models. This adjustment provides a more stringent control over Type I error rates by addressing the potential underestimation of standard errors inherent in the basic three-level modelling approach.

Finally, for the meta-analysis of the relationship between FWF and recovery, we did not apply a multilevel model, as the limited number of available studies each reported only a single effect size. Instead, we estimated both a fixed-effects model and a two-level random-effects model. We chose to report both to allow for comparison, as the random-effects model is generally considered more realistic (Borenstein et al., 2010), while fixed-effects models offer greater statistical power – an important advantage when the number of studies is really small, as is the case here.

Moderator variables

To assess whether the within-study and between-study variance components were statistically significant, we conducted Likelihood Ratio Tests (LRTs) by comparing the full three-level model with reduced models that excluded either the Level 2 (within-study) or Level 3 (between-study) variance component. In cases where significant heterogeneity was detected, study characteristics were incorporated to assess whether they could account for the observed variability in effect sizes. Specifically, we coded two categorical moderators: recovery dimension and study design (cross-lagged panel studies *vs* rest of designs).

Estimation of publication bias and robustness checks

First, we visually examined funnel plots, as a symmetric funnel shape would indicate no publication bias, suggesting that larger sample sizes lead to studies clustering around the

true mean. Second, we conducted Egger's regression tests to statistically assess funnel plot asymmetry. If evidence of publication bias was found, selection models were applied to adjust the overall effect estimate (Vevea & Woods, 2005). We did not use other common tests for publication bias, such as Kendall's tau, due to uncertainties regarding their application to three-level models (Rodgers & Pustejovsky, 2021). Additionally, we conducted an outlier analysis to identify extreme effect sizes. Specifically, we computed the studentized deleted residuals for each effect size (Viechtbauer & Cheung, 2010) and looked for effect sizes with studentized deleted residuals exceeding ±1.96. If potential outliers were found, we excluded them and then re-ran all analyses without these outliers.

Finally, we assessed the robustness of our results using Rosenthal's fail-safe number and prediction intervals. The fail-safe number estimates how many additional null effect sizes would be required to nullify the observed significant effects (Rosenthal, 1979). Prediction intervals show the range where effect sizes are likely to fall with 95% probability in similar future studies (IntHout et al., 2016).

The main analysis, moderation analyses, publication bias assessment, and robustness checks were conducted using the *metafor* package (Viechtbauer, 2010). Robust variance error correction was applied with the *clubSandwhich* package (Pustejovsky, 2024). The complete dataset, including all studies, as well as the R code used for the analysis, is available at this OSF link.

Results

Selected studies and descriptive information

A PRISMA flowchart summarising the study selection process can be found in Figure 1. From the 742 records that were initially identified, ultimately, 69 articles met the inclusion criteria. Two additional clarifications are important. First, three pairs of articles were based on the same sample (e.g. Sanz-Vergel et al., 2010, 2011), and were thus treated as a single study to avoid violating the assumption of independence. Second, five articles each reported two independent studies (e.g. Barber et al., 2019), resulting in a total of 71 independent studies included in the meta-analytic review.

In the following paragraphs, we provide some descriptive information about the characteristics of the studies included in the present meta-analysis. The key characteristics of the included studies, along with the full reference list, can be found at this OSF link. These were published between 2007 and 2024, indicating that research on the relationship between work-family interaction and recovery experiences is still in its early stages. Most of them ($k = 40$) examined the relationship between WFC and recovery, one focused on the relationship between FWC and recovery, 13 explored the relationship between WFF and recovery, and 17 investigated more than one of the aforementioned relationships within the same study.

Among the existing concepts, *work–family conflict* was the most frequently used term to describe negative interference of work with family life ($k = 35$), whereas *work–family facilitation* and *work–life balance* were most commonly used to refer to positive interactions, each appearing in seven studies. The most commonly used expressions to describe the opposite direction of conflict/facilitation were *family-work conflict* ($k = 4$) and *family-work facilitation* ($k = 2$), respectively. In relation to the recovery construct,

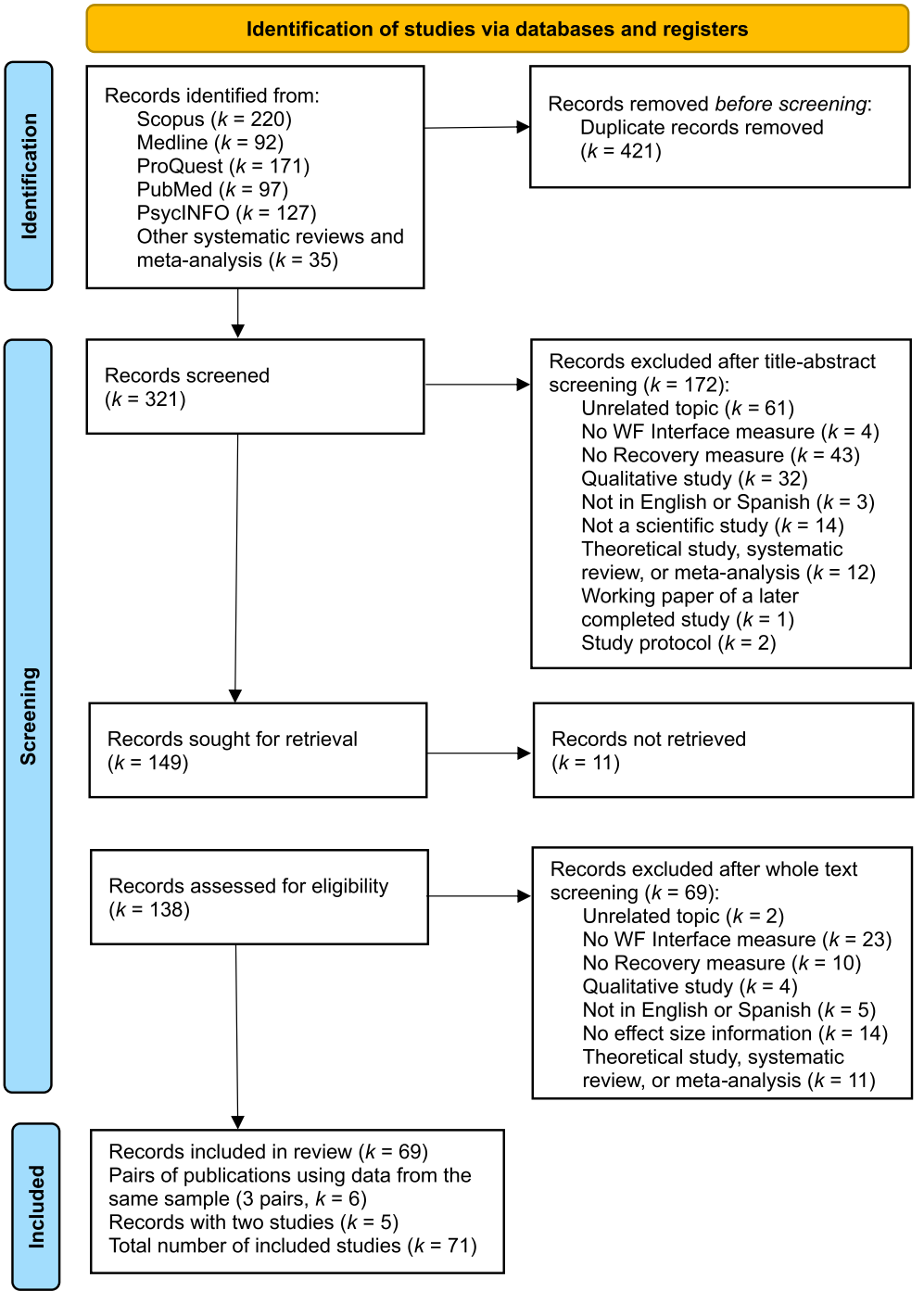


Figure 1. PRISMA flow-chart of included studies.

11 studies measured recovery as the opportunity to engage in activities or take breaks, 2 measured recovery as a state, 55 focused on psychological detachment, 23 on relaxation, 16 on mastery, and 19 on control. The measurement instrument developed by Sonnentag

and Fritz (2007) was by far the most widely used ($k = 58$). All studies, except two, referred to recovery outside work. Most studies employed a cross-sectional design ($k = 44$), while 13 used a five-day diary approach, 8 adopted a longitudinal design, and 6 utilised a cross-lagged panel design. In the latter two, the time intervals between measurement points varied considerably – ranging from two days to four months in longitudinal studies, and from one month to one year in cross-lagged panel studies.

Combined effect size estimates

To answer Research Question 1 (i.e. are all types of work-family interaction related to psychological recovery and what is the magnitude and direction of the effects?), and hypotheses 1 and 2 (i.e. WFC/FWC negatively related to recovery and WFF/FWF positively related to recovery), we calculated combined effect sizes estimates. Please note that in these analyses, "recovery" is treated as an aggregated measure. Table 2 displays our main results. Three combined effect size estimates were significantly different from zero. Specifically, WFC was negatively associated with recovery, $\bar{\rho} = -.42$, 95% CI (–.46, –.36), $t = -14.60$, $p < .001$. A similar but weaker negative association was found between FWC and recovery, $\bar{\rho} = -.17$, 95% CI (–.33, –.04), $t = 2.83$, $p = .019$. In contrast, WFF was positively related to recovery, $\bar{\rho} = .40$, 95% CI (.30, .50), $t = 7.58$, $p < .001$.

Meanwhile, the relationship between FWF and recovery depended on the meta-analytic model employed. Under a fixed-effects model, the correlation was statistically significant, $\bar{\rho} = .40$, 95% CI (.35, .45), $t = 13.43$, $p < .001$; however, under a random-effects model, it was not, $\bar{\rho} = .32$, 95% CI (−.31, .75), $t = 2.16$, $p = .164$. Given the small number of studies included in this meta-analysis ($k = 3$), these results should be interpreted with caution. Taken together, these findings support hypothesis 1, and partially support hypothesis 2.

Moderation analyses

To answer Research Question 2 (i.e. are some types of work-family interaction more strongly related to specific forms of psychological recovery than others?), and hypotheses 3 and 4 (WFC/FWC most strongly related to detachment/relaxation and WFF/FWF most strongly related to mastery and control), we performed moderation analyses. The strength of the relationship between WFC and recovery did not vary based on the specific dimension of recovery ($p = .060$, see Table 3). Similarly, the strength of the relationship between FWC and recovery did not vary across recovery dimensions ($p = .496$; see Table 3). In relation to the WFF–recovery meta-analysis, significant differences emerged based on the recovery subdimension ($p < .001$; see Table 3). Notably, the relationship was stronger when recovery was operationalised as control, $\bar{\rho} = .42$, 95% CI (.30, .52), compared to psychological detachment, $\bar{\rho} = .27$, 95% CI (.14, .39). Regarding the FWF–recovery meta-analysis, we cannot meaningfully interpret the findings because the analysis is based on only three studies, with the same studies involved in both comparisons.

As previously noted, most studies in the meta-analysis operationalised recovery as recovery experiences. A closer examination of these correlations allows us to explore in more depth which specific recovery experiences may be more relevant depending

Table 2. Combined estimates.

Meta-analysis	Model	*k*	NES	*N*	$\bar{r}$	$\bar{\rho}$	(95% CI)	*t*	I^2	L2-LRT	L3-LRT
WFC – Recovery	MM	55	131	20,866	−.36	−.42	(−.46, −.36)	−14.80***	94.91	32.82***	194.78***
FWC – Recovery	MM	11	17	2,931	−.17	−.19	(−.33, −.04)	−2.83*	93.14	0.28	16.59***
WFF – Recovery	MM	22	66	8,928	.35	.40	(.30, .50)	7.58***	96.11	19.14***	111.50***
FWF – Recovery	FE	3	3	1,018	.33	.40	(.35, .45)	13.43***	95.74	–	–
	RE				.27	.32	(−.31, .75)	2.16	94.91	–	39.34***

Notes" * $p < .05$; ** $p < .01$.; *** $p < .001$. *k* = number of studies; NES = number of effect sizes; *N* = total sample size; $\bar{r}$= meta-analytic correlation; $\bar{\rho}$ = corrected meta-analytic correlation; L2-LRT = Within-study (level 2) variance Likelihood Ratio Test. L3-LRT = between-study (level 3) variance Likelihood Ratio Test; WFC = Work-Family Conflict; FWC = Family-Work Conflict; WFF = Work-Family Facilitation; FWF = Family-Work Facilitation; MM = Multilevel Model; FE = Fixed Effects model; RE = Non-multilevel Random Effects model.

Table 3. Recovery dimensions comparison.

	WFC – Recovery MA								FWC – Recovery MA							
	k	NES	*N*	$\bar{r}$	$\bar{\rho}$	(95% CI)	TM	PC	*k*	NES	*N*	$\bar{r}$	$\bar{\rho}$	(95% CI)	TM	PC
Recovery opportunities	7	7	3,732	−.31	−.38	(−.44, −.31)	2.19	-	1	1	152	−.07	−.09	(−.25,.07)	0.93	-
Recovery state	1	1	135	−.37	−.40	(−.53, −.25)			1	1	135	−.21	−.23	(−.38, −.06)		
PsyDetach	46	66	24,530	−.38	−.43	(−.49, −.37)			9	9	2,644	−.12	−.13	(−.31, .06)		
Relaxation	16	22	6,270	−.38	−.43	(−.51, −.36)			3	3	619	−.37	−.41	(−.69, -.01)		
Mastery	10	15	5,035	−.27	−.30	(−.42, −.18)			1	1	366	−.30	−.35	(−.44, −.26)		
Control	14	20	6,374	−.37	−.41	(−.48, −.34)			2	2	870	−.23	−.27	(−.98, .94)		
	WFF – Recovery MA								FWF – Recovery MA							
	k	NES	*N*	$\bar{r}$	$\bar{\rho}$	(95% CI)	TM	PC	*k*	NES	*N*	$\bar{r}$	$\bar{\rho}$	(95% CI)	TM	PC
Recovery opportunities	6	6	3,918	.53	.59	(.42, .72)	4.07***	RO > PD, RX,	1	1	555	.46	.55	(.32, .72)	171.19*	RO > PD
Recovery state	1	2	82	.61	.67	(.32, .86)		MA RS > PD, RX, MA,	-	-	-	-	-	-		
PsyDetach	14	21	6,179	.24	.27	(.14, .39)		CO CO > PD	2	2	463	.16	.18	(−.12, .46)		
Relaxation	10	14	3,964	.28	.34	(.19, .47)			-	-	-	-	-	-		
Mastery	8	11	3,582	.25	.31	(.09, .49)			-	-	-	-	-	-		
Control	8	12	3,789	.35	.42	(.30, .52)			-	-	-	-	-	-		

Notes: * $p < .05$; ** $p < .01$; *** $p < .001$. NES = Number of effect sizes; $\bar{r}$ = meta-analytic correlation; $\bar{\rho}$ = corrected meta-analytic correlation; TM = Test of Moderators; PC = Pairwise Comparisons; PsyDetach = Psychological Detachment; RO = Recovery opportunities; RS = Recovery state; PD = Psychological Detachment; RX = Relaxation; MA = Mastery; CO = Control

on the type of work–family interaction under consideration. For WFC, the strongest correlations were observed for psychological detachment and relaxation ($\bar{\rho} = -.43$), as expected. In relation to WFF, the strongest correlation was found for control ($\bar{\rho} = .42$); however, contrary to our expectations, the second strongest correlation was observed for relaxation rather than mastery. For FWC, relaxation appeared to be the most relevant recovery experience ($\bar{\rho} = -.41$), although these results cannot be meaningfully interpreted due to the small number of studies. Similarly, for FWF, the limited number of studies does not allow for substantive interpretation of the findings. Taken together, these results partially support Hypotheses 3 and 4.

Publication bias and robustness checks

Funnel plots (Figure 2) do not indicate evidence of publication bias. In general, although the plots do not resemble a classic funnel shape, the stronger effect sizes did not come

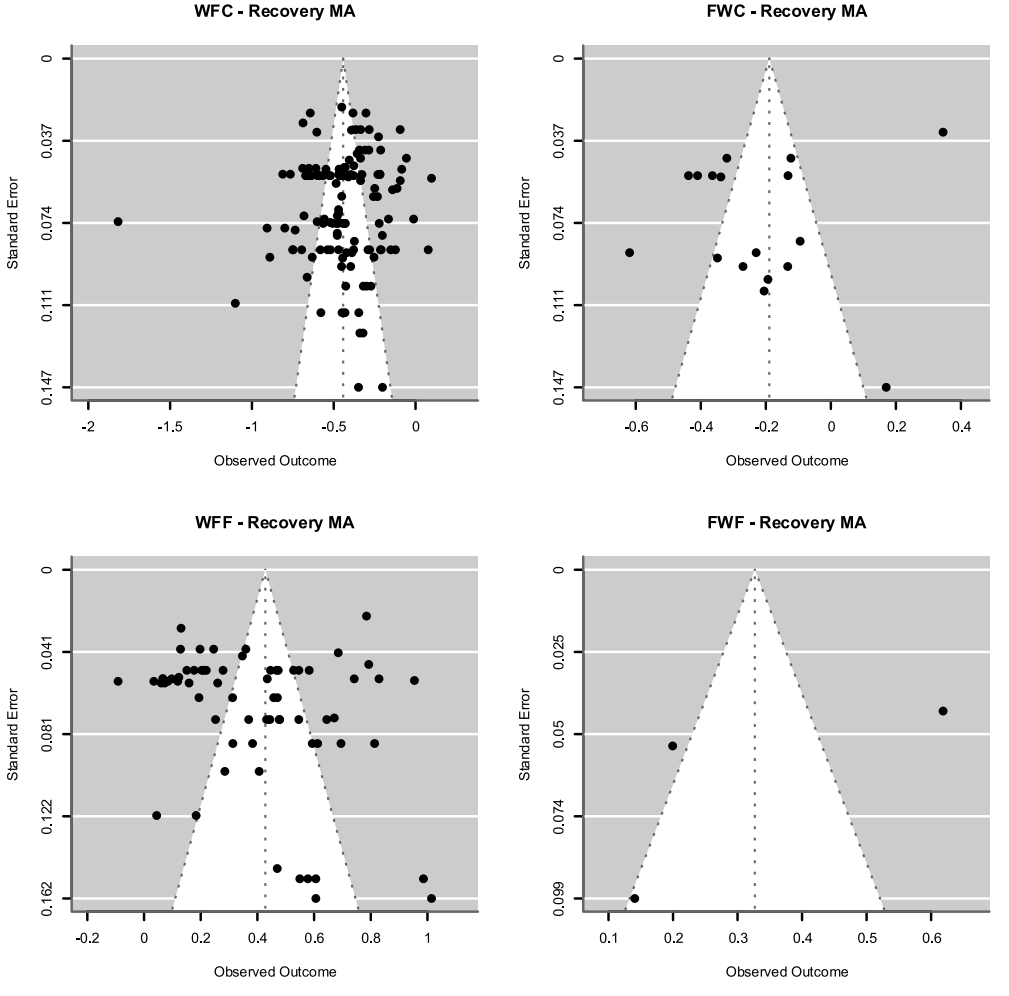


Figure 2. Funnel plots.

Table 4. Statistical tests for publication bias and robustness checks.

Meta-analysis	Egger's test	Outliers	RFSN (TN)	(95% PI)
WFC – Recovery	−1.09 (p = .364)	0	351,211 (665)	(−.72, .02)
FWC – Recovery	0.03 (p = .989)	0	1,034 (95)	(−.60, .30)
WFF – Recovery	1.49 (p = .318)	0	66,460 (340)	(−.14, .76)
FWF – Recovery	0.73 (p = .488)	0	0 (25)	(−.74, .92)

Notes: WFC = Work-Family Conflict. FWC = Family-Work Conflict; WFF = Work-Family Facilitation; FWF = Family-Work Facilitation; RSFN = Rosenthal's Fail-Safe Number; TN = Threat Number (5 * NES + 10); NES = Number of effect sizes; PI = Prediction interval.

from studies with smaller sample sizes. Relatedly, the three-level Egger regression test was not significant in any of the cases ($ps > .249$, Table 4). Therefore, in the absence of evidence of publication bias, no selection methods were applied to obtain an adjusted estimate of the overall effect size. Furthermore, no outlying effect sizes were detected, as all studentized residuals fell within the established cut-offs (i.e. ±1.96).

Rosenthal's fail-safe number fell below the threshold of $5 * k + 10$ (Rosenthal, 1979) for the meta-analysis of FWF and recovery, suggesting that this result is not robust – which is consistent with its non-significance under the random-effects model. Additionally, the prediction intervals included both negative and positive values in all cases, indicating that future studies could yield results that diverge from current expectations.

Additional analyses

As additional analyses, we first explored potential differences based on the research design. In particular, we compared effect sizes from cross-lagged panel studies with those from other study designs (i.e. cross-sectional, diary, and longitudinal), as the correlations derived from the latter were all between-level relationships, making direct comparisons between them less meaningful. Results showed that study design was not a significant moderator in any of the overall analyses ($ps > .111$).

Second, we identified five[1] longitudinal studies reporting on the association between WFC and psychological detachment, which enabled us to conduct a Continuous Time Meta-Analysis (CoTiMA) using the CoTiMA package in R (Dormann & Homberg, 2021). This method is specifically designed to integrate longitudinal data from studies that differ in both the number of measurement waves and the time intervals between them (Dormann et al., 2020; Guthier et al., 2020). By transforming discrete-time estimates into a continuous-time framework, CoTiMA allows for the estimation of autoregressive and cross-lagged effects, offering insights into how WFC and psychological detachment influence each other over time. In addition, this approach estimates the optimal time lag, that is, the time interval at which the predictive effect of one variable on the other is maximised (Dormann & Griffin, 2015). Importantly, in this case, we did not correct the correlations for unreliability, as the resulting matrix of corrected correlations was not positive definite and therefore could not be analysed.

The analysis yielded the following results (see Figure 3). First, both WFC, $\bar{r}$ = .47, 95% CI (.40, .54), t = 12.91, $p < .001$, and psychological detachment, $\bar{r}$ = .39, 95% CI (.33, .47), t = 10.50, $p < .001$, exhibited significant temporal stability, as indicated by their autoregressive parameters. Second, and more central to our research question, the cross-lagged effects between WFC and psychological detachment were not significantly different

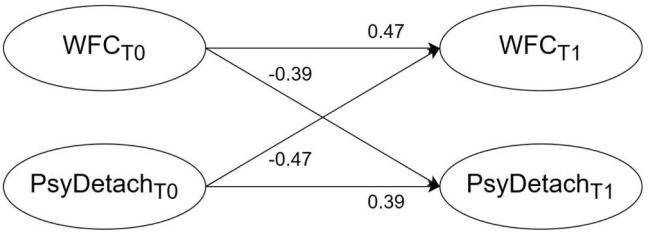


Figure 3. WFC-psychological detachment CoTiMA main results.

from each other (LRT $p = .060$), suggesting a bidirectional and quite symmetrical relationship over time (WFC→PD $\bar{r} = -.39$, 95% CI (−.44, −.34), $t = -15.36$, $p < .001$; PD→WFC $\bar{r} = -.47$, 95% CI (−.51, −.42), $t = -19.09$, $p < .001$). Finally, the optimal time lag for both directions of the relationship was estimated to be approximately one month, which aligns with the most common measurement interval used across the included studies.

These findings indicate that the reciprocal relationship between WFC and psychological detachment unfolds over relatively short time periods and that both variables exert comparable longitudinal influences on one another. However, these conclusions should be interpreted with caution due to the limited number of studies included ($k = 5$, $N = 1{,}442$).

Discussion

The main objectives of the present meta-analysis were to explore (a) whether all types of work-family interaction were related to recovery and the magnitude and direction of the effects, and (b) whether the strength of the relationships varied depending on type of recovery. We also proposed specific hypotheses to analyse the differential relationship between negative and positive forms of work-family and each of the four recovery experiences proposed by Sonnentag and Fritz (2007). To do so, we applied a resource-based perspective, mainly relying on COR theory's corollaries of loss and gain cycles (Hobfoll, 2001) and the Work-Home Resources model (Ten Brummelhuis & Bakker, 2012).

Our meta-analysis provides the most comprehensive synthesis to date of how both positive and negative forms of work-family interaction relate to recovery. Unlike previous fragmented studies, our findings empirically validate the theoretical claim that work-family dynamics and recovery are interdependent processes that unfold through resource loss and gain spirals. This meta-analysis also reveals that conflict and facilitation processes are linked to different recovery pathways (i.e. diversionary vs control). By mapping the dominant conceptual and methodological tendencies across 71 studies, our work uncovers where theoretical advancement is needed and where empirical attention remains limited. In the following sections, we discuss the main theoretical and practical implications derived from our findings, as well as the main limitations of the study.

Key findings and theoretical implications of the study

Our first research question explored whether various forms of work-family interaction are associated with recovery (as an aggregated measure), and if so, what the strength

and direction of these effects might be. The findings indicate that WFC is the form of work–family interaction most strongly associated with recovery, followed closely by WFF. Given that, except two, all the studies included in this review conceptualised recovery as occurring in the non-work domain, it is not surprising that work-to-family processes show the strongest associations with recovery. This pattern is consistent with the broader recovery literature, which conceptualises recovery as psychological unwinding from work demands during leisure time (Sonnentag & Fritz, 2007). Accordingly, future research on recovery processes taking place during employees' leisure time would benefit from focusing more explicitly on the work-to-family direction. At the same time, the present findings highlight that examining not only conflict but also facilitation is important for understanding how individuals recover from work. WFF has often been an overlooked dimension as a core mechanism in occupational health models. As Friedman and Greenhaus (2000) pointed out, it is unfortunate that this positive side is often neglected because work and family are not only enemies but also allies, and from a practical viewpoint, it is important to identify how to foster positive dynamics between these domains. Given the strong relationship found between WFF and recovery in our analysis, we call for more studies examining this type of work-family interaction.

Regarding the traditionally neglected direction of the work-family interface (i.e. family-to-work) (Stevens et al., 2007), its examination also yields valuable insights. We found that the relationship between FWC and recovery is significant, but weaker than the relationship between WFC and recovery. Because WFC and FWC have unique antecedents and outcomes (Amstad et al., 2011; Byron, 2005), future studies could zoom in into the role of FWC in the recovery process (i.e. this direction may be more strongly related to recovery in the work domain). Finally, we are unable to interpret the results of the FWF meta-analysis due to the small number of studies included. Additional research examining this positive form of work–family interaction is needed to provide deeper insight into this association.

Examining these relationships more closely, Hypotheses 1 and 2 posited negative associations between WFC/FWC and recovery, and positive associations for WFF/FWF. In line with COR theory (Hobfoll, 2001) and the Work-Home Resources model (Ten Brummelhuis & Bakker, 2012), our meta-analytic findings point to opposing resource processes, reflected in the negative relationship between WFC/FWC and recovery and the positive association between WFF and recovery. Although the resource-based perspective has been applied to the work–family and recovery literatures independently (Grandey & Cropanzano, 1999; Sonnentag & Fritz, 2007), the present findings provide empirical support for the interdependence of these two fields and their joint contribution to resource loss and gain spirals.

Research question 2 explored whether some types of work-family interaction are more strongly related to specific forms of recovery than others. Our findings show that the relationship between both types of conflict and recovery did not vary based on the specific dimension of recovery. This suggests that recovery – whether conceptualised as an outcome (i.e. the state of being recovered), a process (i.e. the experiences), or an opportunity (i.e. the conditions that enable individuals to disengage and recover) – is influenced by the negative synergies between the work and non-work domains. A distinct pattern of results emerges when analysing the positive interaction between work and family. Specifically, the moderation analysis for WFF was significant: the relationship

between WFF and recovery was stronger when recovery was operationalised as control, compared to psychological detachment. As discussed later, this has important theoretical implications – initial positive synergies between work and non-work can facilitate the accumulation of resources.

Among the various forms of recovery, the four recovery experiences have received the most empirical attention. Accordingly, in Hypotheses 3 and 4, we argued that WFC/FWC would be more strongly related to diversionary strategies (i.e. psychological detachment and relaxation), whereas WFF/FWF would be more strongly related to mastery-oriented strategies (i.e. control and mastery). Given the limited number of studies on the family-to-work direction, the discussion focuses on the work-to-family direction. Overall, our findings support the notion that negative and positive forms of work–family interaction relate to recovery in different ways – while diversionary strategies play an important role in WFC processes, WFF is most strongly linked to resources such as control.

Our results position recovery experiences as a central construct in COR-based models of work–family dynamics. To guide future research, we elaborate a theoretical model representing this dual resource-based pathway (Figures 4 and 5). Our model highlights the four recovery experiences in order of their relative importance, as indicated by the strength of their associations with WFC/WFF. We also add theoretical grounding by positioning each recovery experience as a diversionary strategy, a constructive resource, or a mastery-oriented strategy. This theoretical framing is important because it introduces meaningful implications for health and well-being (i.e. associated risks and benefits). Finally, we suggest which existing theories could guide future research, depending on whether scholars aim to examine the resource loss or gain pathway.

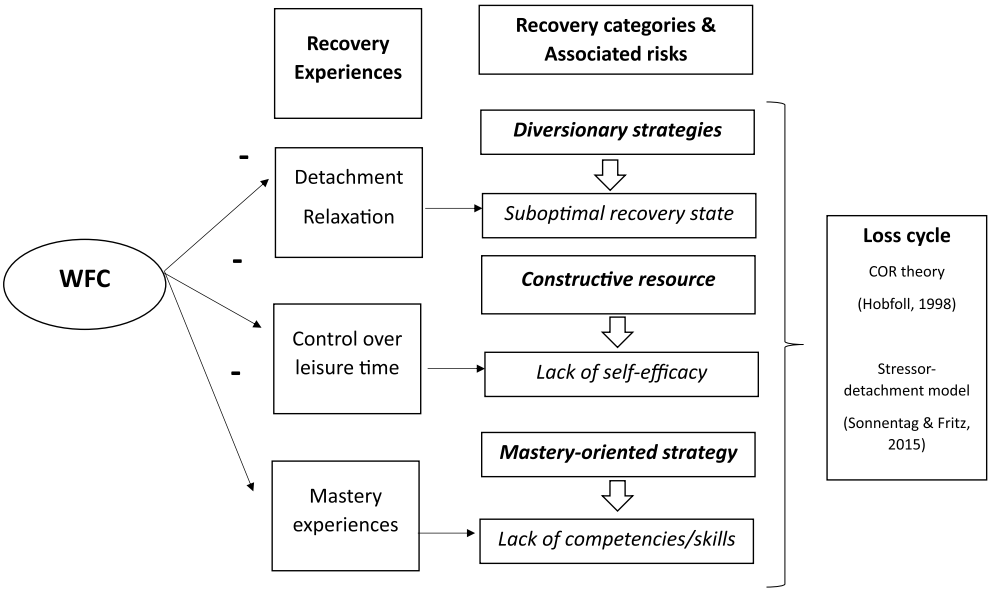


Figure 4. The work-family interface and recovery experiences: A dual resource-based pathway for future research (loss cycle).

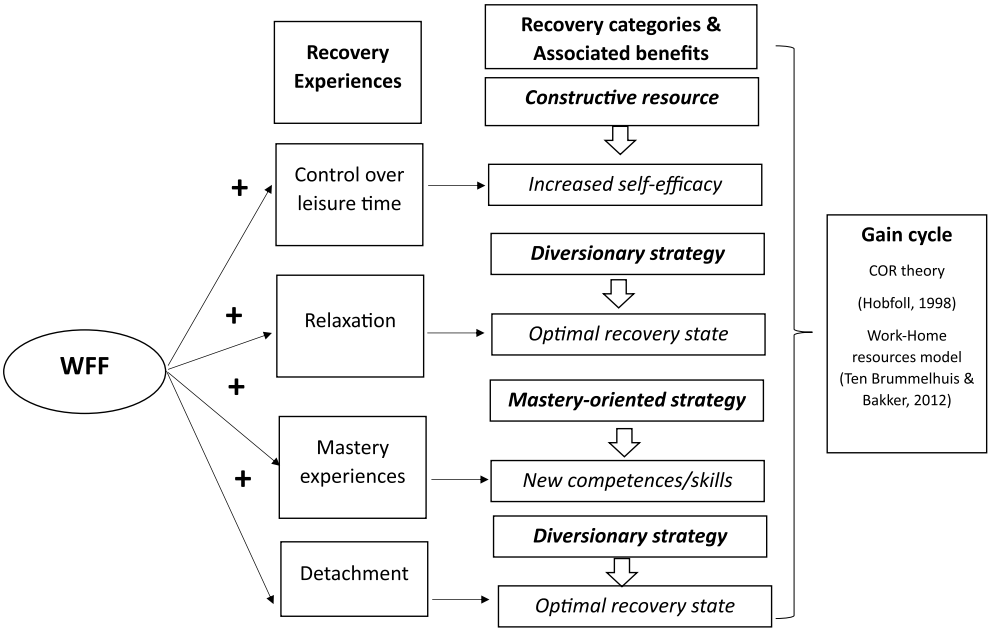


Figure 5. The work-family interface and recovery experiences: A dual resource-based pathway for future research (gain cycle).

As shown in Figure 4, WFC was most strongly associated with psychological detachment and relaxation, as expected. These findings align with and reinforce results reported in previous research (Derks & Bakker, 2014; Molino et al., 2015). They are also consistent with Hobfoll's (2001) theory, which suggests that an initial loss of resources leads to further resource loss (e.g. an inability to detach and relax), as well as with the stressor–detachment model (Sonnentag & Fritz, 2015), which highlights that stressors (e.g. WFC) lead to difficulties in disconnecting. Regarding WFF, the strongest association was found with control over leisure time (see Figure 5). Control over leisure time can be considered as an "external resource," a pre-requisite that allows individuals to initiate their recovery process (Sonnentag & Fritz, 2007). This is also in line with the Work-Home Resources model (Ten Brummelhuis & Bakker, 2012), where "time" is a key instrumental resource that facilitates performance in the family role. Interestingly, the second experience most related to WFF was relaxation rather than mastery, as we expected. This can also be interpreted through the lens of the Work–Home Resources model. The model suggests that when experiences at work improve functioning in the home domain, individuals build physical energy. From this perspective, WFF may contribute to the development of new energy via relaxation.

With our dual resource-based approach, we go one step further by suggesting potential risks and benefits associated with the WFC/WFF–recovery link. For example, WFC is associated with reduced psychological detachment and relaxation, which, in turn, could impede an adequate recovery state. In contrast, WFF increases control over leisure time, which, in turn, might enhance employees' self-efficacy (Sonnentag & Fritz, 2007). We

encourage scholars to examine recovery experiences as mediators in the relationship between WFC/WFF and downstream outcomes.

Finally, as additional analysis, we explored whether the relationship between work-family and recovery was reciprocal. The results revealed a bidirectional relationship between WFC and psychological detachment from work, supporting the existence of a resource loss spiral (Hobfoll, 2001). This finding aligns with those of Dettmers (2017), who also provided evidence of a resource loss spiral: WFC at Time 1 predicted low detachment at Time 2, which subsequently led to higher WFC at Time 3. This pattern reinforces the utility of COR theory (Hobfoll, 1989), and particularly the concept of resource loss and gain spirals (Hobfoll, 2001), as a valuable theoretical framework for guiding research in this domain. From a methodological perspective, the fact that the optimal time lag found in this analysis was one month supports Dormann and Griffin's (2015) call for the increased use of longitudinal study designs with shorter time lags (i.e. "shortitudinal"). These results should be interpreted with caution, given that the analysis is based on only five longitudinal studies.

Limitations of the study and suggestions for future research

Despite the abovementioned contributions, our study is not without limitations. Some of these limitations stem from the scope and design of our meta-analysis, whereas others reflect broader constraints in the existing body of research. In particular, as our findings are based on primary studies, they are inevitably shaped by the characteristics, measures, and methodological choices of those studies. As such, certain limitations identified here may also be indicative of limitations in the field more generally.

First, the studies included in this meta-analysis are based on self-reports. This has been a common limitation in previous meta-analyses too (Bennett et al., 2018; Nohe et al., 2015). However, some of the included studies have taken steps to reduce the common-method bias such as gathering data at different moments of the day or on different days separated by months or even years. Future studies on the field could collect information from other sources such as partners or colleagues.

Second, although both work–family conflict and recovery from work are inherently dynamic processes that unfold over time, the present meta-analysis synthesises predominantly cross-sectional correlational evidence. Such designs do not allow the identification of temporal ordering or the full set of antecedents, mediators, and outcomes implied by process models of the work–family interface and recovery (e.g. models of effort–recovery cycles or work–family spill-over processes). Therefore, our conclusions concern the strength and consistency of associations between these constructs rather than causal pathways. Longitudinal and experience-sampling designs – with repeated measurements across days or weeks – are better suited for capturing the dynamic, reciprocal nature of these processes. Our findings nevertheless provide a valuable foundation by establishing the robustness of the WFC–recovery link, as well as the potential for reciprocal relationships, which future research can build upon to test dynamic mechanisms more explicitly.

Third, an additional limitation concerns the imbalance in the constructs examined in the primary studies. Most studies have focused on WFC and psychological detachment. Although these constructs capture core aspects of work–family and recovery dynamics (e.g. Greenhaus & Beutell, 1985; Sonnentag & Fritz, 2015), our findings suggest that

other dimensions may also play an important role in shaping the interplay between these domains. For example, WFF shows a strong relationship with recovery, yet it has received comparatively less attention. A similar pattern was observed for recovery experiences such as control over leisure time, which was assessed in only 19 studies compared with 55 for psychological detachment. This is noteworthy given that control appears to be particularly relevant for positive work–family processes. Taken together, these patterns highlight the need for a broader exploration of the work–family–recovery interface.

Fourth, the analysis of recovery at work also needs further scholarly attention. Out of 71 studies, only two examined recovery in the work domain (Nitzsche et al., 2017; Sanz-Vergel et al., 2010). To gain a more comprehensive understanding of how work–family dynamics influence recovery, it is important to consider not only recovery outside work, but also recovery at work. For example, it is possible that FWC (i.e. family interruptions while working) impedes recovery at work, as employees may be focused on resolving family issues rather than engaging in recovery activities during breaks.

Finally, our study focused on the relationship between work–family dynamics and recovery, and exploring other potential mediators or moderators was beyond its scope. However, we present a theoretical model that outlines avenues for future research, proposing that recovery experiences might mediate the relationship between WFC/WFF and different outcomes. Future studies could use this model as a foundation to explore other relationships (i.e. additional mediators between work-family and recovery) as well as a broader range of associated outcomes. This would help advance knowledge of spillover and crossover processes by examining how work demands influence family and home-related experiences, and vice versa, through recovery processes.

Practical implications

Our study has important implications for practice. We provide evidence that recovery is interconnected with work-family dynamics. Organisational interventions should incorporate an area dedicated to recovery, instead of focusing exclusively on the application of work-family policies. Our results show that psychological detachment and relaxation are strongly related to WFC, and the CoTiMA analysis reinforces the idea of a loss spiral between detachment and WFC. On the light of these results, focusing on these diversionary strategies seems crucial. Training employees on transition rituals and helping them identify activities that they perceive enjoyable has proven to be efficient to increase detachment (Hahn et al., 2011). Mindfulness and cognitive–behavioral strategies can also help increase this recovery experience (Reis et al., 2024), while training on progressive muscle relaxation and good sleep hygiene can foster relaxation (Hahn et al., 2011). Our study also shows that WFF strongly relates to control over leisure time – an often a neglected recovery experience. Therefore, organisations could provide training on goal setting and time management techniques to foster control not only at work but also outside work (Hahn et al., 2011).

Although in this meta-analysis only two studies focused on recovery at work, their results provide some insights such as the importance of feeling recovered after a break at work and having recovery opportunities during the working day. Job design is a key element in this respect. Organisations should design jobs with realistic workloads that allow employees opportunities to take a respite from work (Fritz & Sonnentag, 2005).

Employees themselves can be proactive and take some actions to ensure they benefit from their breaks at work. Avoiding work-related conversations and engaging in outdoor activities such as taking a walk can increase their feeling of recovery (Trougakos et al., 2011). Some individuals may be reluctant to take breaks because they find it mentally difficult to reconnect with the task (Sonnentag et al., 2017). However, it has been shown that the duration of the break is not as important as the feeling of being recovered after the break, which means that even a 10-minute break can make a difference (Lyubykh et al., 2022).

Conclusion

To conclude, this meta-analysis brings together two important areas of research in the field of occupational and organisational psychology: the work-family interface and psychological recovery from work. This is a growing research field that is gaining momentum and attracting scholars' attention across the globe. We showed the differential pattern of relationships between WFC/WFF and recovery: whereas conflict impairs recovery, WFF enhances it. We identified some gaps in the literature that will hopefully help inform theory and practice, and presented a theoretical model to guide future research. Organisations should incorporate recovery as a key element of their work-family interventions, providing employees with skills and opportunities to recover both at work and outside work.

Note

1. Studies 1 and 2 from Siegl (2023) were also longitudinal and examined the relationship between WFC and psychological detachment (PD); however, the author reported only cross-sectional correlations within each time point, not the between-time correlations required to perform a CoTiMA.

Acknowledgements

We thank colleagues from the Employment, Systems and Institutions group at Norwich Business School for their comments on previous versions of this work.

Disclosure statement

No potential conflict of interest was reported by the author(s).

During the preparation of this work the authors used COPILOT in order to improve the readability of some sentences. After using this tool/service, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

Rights retention statement

For the purpose of open access, the author has applied a CC BY public copyright licence to any Author Accepted Manuscript version arising from this submission.

Ethics declaration

Please note that based on the criteria from the ethical committee where the data analysis took place (Complutense University of Madrid), the meta-analysis is exempt from ethical approval as we are not collecting data directly from human participants. We are collecting and analysing data from previous studies in which informed consent was obtained by the primary researchers.

References

Amstad, F. T., Meier, L. L., Fasel, U., Elfering, A., & Semmer, N. K. (2011). A meta-analysis of work–family conflict and various outcomes with a special emphasis on cross-domain versus matching-domain relations. *Journal of Occupational Health Psychology*, *16*(2), 151. https://doi.org/10.1037/a0022170

Amstad, F. T., & Semmer, N. K. (2009). Recovery and the work–family interface. In P. Perrewé, J. Halbesleben, & C. Rose (Eds.), *Current perspectives on job-stress recovery* (pp. 125–166). Bingley: Emerald Group. https://doi.org/10.1108/S1479-3555(2009)0000007007

Barber, L. K., Conlin, A. L., & Santuzzi, A. M. (2019). Workplace telepressure and work–life balance outcomes: The role of work recovery experiences. *Stress and Health*, *35*(3), 350–362. https://doi.org/10.1002/smi.2864

Bennett, A. A., Bakker, A. B., & Field, J. G. (2018). Recovery from work-related effort: A meta-analysis. *Journal of Organizational Behavior*, *39*(3), 262–275. https://doi.org/10.1002/job.2217

Borenstein, M., & Hedges, L. V. (2019). Effect sizes for meta-analysis. In H. Cooper, L. V. Hedges, & J. C. Valentine (Eds.), *The handbook of research synthesis and meta-analysis* (3rd ed., pp. 207–243). Russell Sage Foundation.

Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2010). A basic introduction to fixed-effect and random-effects models for meta-analysis. *Research Synthesis Methods*, *1*(2), 97–111. https://doi.org/10.1002/jrsm.12

Byron, K. (2005). A meta-analytic review of work–family conflict and its antecedents. *Journal of Vocational Behavior*, *67*(2), 169–198. https://doi.org/10.1016/j.jvb.2004.08.009

Corporation for Digital Scholarship. (2023). *Zotero* (6.0.36) [Software]. https://www.zotero.org/.

Demerouti, E., Bakker, A. B., Geurts, S. A. E., & Taris, T. W. (2009). Daily recovery from work-related effort during non-work time. In S. Sonnentag, P. L. Perrewé, & D. C. Ganster (Eds.), *Current perspectives on Job-stress recovery* (pp. 85–123). Emerald Group Publishing Limited.

Demerouti, E., Bakker, A. B., & Sanz-Vergel, A. I. (2013). Recovery and work-life interface. In D. A. Major, & R. Burke (Eds.), *Handbook of work–life integration among professionals: Challenges and opportunities* (pp. 225–244). Edward Elgar Publishing.

Derks, D., & Bakker, A. B. (2014). Smartphone use, work-home interference, and burnout: A diary study on the role of recovery. *Applied Psychology*, *63*(3), 411–440. https://doi.org/10.1111/j.1464-0597.2012.00530.x

Dettmers, J. (2017). How extended work availability affects well-being: The mediating roles of psychological detachment and work-family-conflict. *Work & Stress*, *31*(1), 24–41. https://doi.org/10.1080/02678373.2017.1298164

Dormann, C., & Griffin, M. A. (2015). Optimal time lags in panel studies. *Psychological Methods*, *20*(4), 489–505. https://doi.org/10.1037/met0000041

Dormann, C., Guthier, C., & Cortina, J. M. (2020). Introducing continuous time meta-analysis (CoTiMA). *Organizational Research Methods*, *23*(4), 620–650. https://doi.org/10.1177/1094428119847277

Dormann, C., & Homberg, M. (2021). *CoTiMA: continuous time meta-analysis ('CoTiMA') (p. 0.8.0)* [Software]. https://CRAN.R-project.org/package=CoTiMA.

Etzion, D., Eden, D., & Lapidot, Y. (1998). Relief from job stressors and burnout: Reserve service as a respite. *Journal of Applied Psychology*, *83*(4), 577–585.

Fernández-Castilla, B., Aloe, A. M., Declercq, L., Jamshidi, L., Beretvas, S. N., Onghena, P., & Van Den Noortgate, W. (2021). Estimating outcome-specific effects in meta-analyses of multiple outcomes: A simulation study. *Behavior Research Methods*, *53*(2), 702–717. https://doi.org/10.3758/s13428-020-01459-4

Friedman, S. D., & Greenhaus, J. H. (2000). *Work and family–allies or enemies? What happens when business professionals confront life choices*. Oxford University Press.

Fritz, C., & Sonnentag, S. (2005). Recovery, health, and job performance: Effects of weekend experiences. *Journal of Occupational Health Psychology*, *10*(3), 187. https://doi.org/10.1037/1076-8998.10.3.187

Frone, M. R., Yardley, J. K., & Markel, K. S. (1997). Developing and testing an integrative model of the work–family interface. *Journal of Vocational Behavior*, *50*(2), 145–167. https://doi.org/10.1006/jvbe.1996.1577

Geurts, S. A., & Sonnentag, S. (2006). Recovery as an explanatory mechanism in the relation between acute stress reactions and chronic health impairment. *Scandinavian Journal of Work, Environment & Health*, *32*(6), 482–492. https://doi.org/10.5271/sjweh.1053

Geurts, S. A. E., Taris, T. W., Kompier, M. A. J., Dikkers, J. S. E., Van Hooff, M. L. M., & Kinnunen, U. M. (2005). Work-home interaction from a work psychological perspective: Development and validation of a new questionnaire, the SWING. *Work & Stress*, *19*(4), 319–339. https://doi.org/10.1080/02678370500410208

Grandey, A. A., & Cropanzano, R. (1999). The conservation of resources model applied to work–family conflict and strain. *Journal of Vocational Behavior*, *54*(2), 350–370. https://doi.org/10.1006/jvbe.1998.1666

Greenhaus, J. H., & Beutell, N. J. (1985). Sources of conflict between work and family roles. *Academy of Management Review*, *10*(1), 76–88. https://doi.org/10.5465/amr.1985.4277352

Guthier, C., Dormann, C., & Voelkle, M. C. (2020). Reciprocal effects between job stressors and burnout: A continuous time meta-analysis of longitudinal studies. *Psychological Bulletin*, *146*(12), 1146–1173. https://doi.org/10.1037/bul0000304

Hahn, V. C., Binnewies, C., Sonnentag, S., & Mojza, E. J. (2011). Learning how to recover from job stress: Effects of a recovery training program on recovery, recovery-related self-efficacy, and well-being. *Journal of Occupational Health Psychology*, *16*(2), 202. https://doi.org/10.1037/a0022169

Headrick, L., Newman, D. A., Park, Y. A., & Liang, Y. (2023). Recovery experiences for work and health outcomes: A meta-analysis and recovery-engagement-exhaustion model. *Journal of Business and Psychology*, *38*(4), 821–864. https://doi.org/10.1007/s10869-022-09821-3

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, *44*(3), 513–524. doi:10.1037/0003-066X.44.3.513

Hobfoll, S. E. (2001). The influence of culture, community, and the nested-self in the stress process: Advancing conservation of resources theory. *Applied Psychology*, *50*(3), 337–421. https://doi.org/10.1111/1464-0597.00062

IntHout, J., Ioannidis, J. P. A., Rovers, M. M., & Goeman, J. J. (2016). Plea for routinely presenting prediction intervals in meta-analysis. *BMJ Open*, *6*(7), e010247. https://doi.org/10.1136/bmjopen-2015-010247

Lapierre, L. M., Hammer, L. B., Truxillo, D. M., & Murphy, L. A. (2012). Family interference with work and workplace cognitive failure: The mitigating role of recovery experiences. *Journal of Vocational Behavior*, *81*(2), 227–235. https://doi.org/10.1016/j.jvb.2012.07.007

Lyubykh, Z., Gulseren, D., Premji, Z., Wingate, T. G., Deng, C., Bélanger, L. J., & Turner, N. (2022). Role of work breaks in well-being and performance: A systematic review and future research agenda. *Journal of Occupational Health Psychology*, *27*(5), 470. https://doi.org/10.1037/ocp0000337

Michel, J. S., Kotrba, L. M., Mitchelson, J. K., Clark, M. A., & Baltes, B. B. (2011). Antecedents of work–family conflict: A meta-analytic review. *Journal of Organizational Behavior*, *32*(5), 689–725. https://doi.org/10.1002/job.695

Molino, M., Cortese, C. G., Bakker, A. B., & Ghislieri, C. (2015). Do recovery experiences moderate the relationship between workload and work-family conflict? *Career Development International*, *20*(7), 686–702. https://doi.org/10.1108/CDI-01-2015-0011

Moreno-Jiménez, B., Mayo, M., Sanz-Vergel, A. I., Geurts, S., Rodríguez-Muñoz, A., & Garrosa, E. (2009). Effects of work–family conflict on employees' well-being: The moderating role of recovery strategies. *Journal of Occupational Health Psychology*, *14*(4), 427–440. https://doi.org/10.1037/a0016739

Nitzsche, A., Neumann, M., Groß, S. E., Ansmann, L., Pfaff, H., Baumann, W., Wirtz, M., Schmitz, S., & Ernstmann, N. (2017). Recovery opportunities, work–home conflict, and emotional exhaustion among hematologists and oncologists in private practice. *Psychology, Health & Medicine*, *22*(4), 462–473. https://doi.org/10.1080/13548506.2016.1237666

Nohe, C., Meier, L. L., Sonntag, K., & Michel, A. (2015). The chicken or the egg? A meta-analysis of panel studies of the relationship between work–family conflict and strain. *Journal of Applied Psychology*, *100*(2), 522. https://doi.org/10.1037/a0038012

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, *n71*, https://doi.org/10.1136/bmj.n71

Pustejovsky, J. (2024). *clubSandwich: Cluster-Robust (sandwich) variance estimators with small-sample corrections* (Version 0.5.11) [Software]. https://cran.r-project.org/web/packages/clubSandwich/clubSandwich.pdf.

Reis, D., Hart, A., Krautter, K., Prestele, E., Lehr, D., & Friese, M. (2024). Mindfulness and cognitive–behavioral strategies for psychological detachment: Comparing effectiveness and mechanisms of change. *Journal of Occupational Health Psychology*, *29*(4), 258. https://doi.org/10.31234/osf.io/f9nc7

Rodgers, M. A., & Pustejovsky, J. E. (2021). Evaluating meta-analytic methods to detect selective reporting in the presence of dependent effect sizes. *Psychological Methods*, *26*(2), 141–160. https://doi.org/10.1037/met0000300

Rodríguez-Muñoz, A., Sanz-Vergel, A. I., Demerouti, E., & Bakker, A. B. (2012). Reciprocal relationships between job demands, job resources, and recovery opportunities. *Journal of Personnel Psychology*, *11*(2), 86–94. https://doi.org/10.1027/1866-5888/a000049

Rosenthal, R. (1979). The file drawer problem and tolerance for null results. *Psychological Bulletin*, *86*(3), 638–641. https://doi.org/10.1037/0033-2909.86.3.638

Sanz-Vergel, A. I., Demerouti, E., Bakker, A. B., & Moreno-Jiménez, B. (2011). Daily detachment from work and home: The moderating effect of role salience. *Human Relations*, *64*(6), 775–799. https://doi.org/10.1177/0018726710393368

Sanz-Vergel, A. I., Demerouti, E., Moreno-Jiménez, B., & Mayo, M. (2010). Work-family balance and energy: A day-level study on recovery conditions. *Journal of Vocational Behavior*, *76*(1), 118–130. https://doi.org/10.1016/j.jvb.2009.07.001

Siegl, L. V. (2023). *The right to disconnect: An intervention study to examine the effect of constant connectivity through work-emails on work-home conflict recovery burnout and performance* [Doctoral dissertation]. United Kingdom: The University of Manchester.

Sonnentag, S., Cheng, B. H., & Parker, S. L. (2022). Recovery from work: Advancing the field toward the future. *Annual Review of Organizational Psychology and Organizational Behavior*, *9*(1), 33–60. https://doi.org/10.1146/annurev-orgpsych-012420-091355.

Sonnentag, S., & Fritz, C. (2007). The recovery experience questionnaire: Development and validation of a measure for assessing recuperation and unwinding from work. *Journal of Occupational Health Psychology*, *12*(3), 204–221. https://doi.org/10.1037/1076-8998.12.3.204

Sonnentag, S., & Fritz, C. (2015). Recovery from job stress: The stressor-detachment model as an integrative framework. *Journal of Organizational Behavior*, *36*(S1), S72–S103. https://doi.org/10.1002/job.1924

Sonnentag, S., & Geurts, S. A. E. (2009). Methodological issues in recovery research. In S. Sonnentag, P. L. Perrewé, & D. C. Ganster (Eds.), *Current perspectives on Job-stress recovery* (pp. 1–36). Emerald).

Sonnentag, S., & Kruel, U. (2006). Psychological detachment from work during off-job time: The role of job stressors, job involvement, and recovery-related self-efficacy. *European Journal of Work and Organizational Psychology*, *15*(2), 197–217. https://doi.org/10.1080/13594320500513939

Sonnentag, S., Unger, D., & Rothe, E. (2015). Recovery and the work–family interface. In T. D. Allen, & L. T. Eby (Eds.), *Oxford handbooks online* (pp. 95–106). Oxford University Press.

Sonnentag, S., Venz, L., & Casper, A. (2017). Advances in recovery research: What have we learned? What should be done next? *Journal of Occupational Health Psychology*, *22*(3), 365–380. https://doi.org/10.1037/ocp0000079

Sousa, C., & Silva, L. (2025). Rest to resist: How recovery shields well-being from work–family strain. *Behavioral Sciences*, *15*(8), 1089. https://doi.org/10.3390/bs15081089

Steed, L. B., Swider, B. W., Keem, S., & Liu, J. T. (2021). Leaving work at work: A meta-analysis on employee recovery from work. *Journal of Management*, *47*(4), 867–897. https://doi.org/10.1177/0149206319864153

Stevens, D. P., Minnotte, K. L., Mannon, S. E., & Kiger, G. (2007). Examining the "neglected side of the work-family interface". *Journal of Family Issues*, *28*(2), 242–262. https://doi.org/10.1177/0192513x06294548

Stone, A. A., Kennedy-Moore, E., & Neale, J. M. (1995). Association between daily coping and end-of-day mood. *Health Psychology*, *14*(4), 341–349. doi:10.1037/0278-6133.14.4.341

Ten Brummelhuis, L. L., & Bakker, A. B. (2012). A resource perspective on the work–home interface: The work–home resources model. *American Psychologist*, *67*(7), 545. https://doi.org/10.1037/a0027974

Trougakos, J. P., Hideg, I., & Cheng, B. H. (2011, January). Lunch breaks unpacked: The effect of daily lunch break activities and control over break on fatigue. In *Academy of management proceedings* (Vol. 2011, No. 1, pp. 1–6). Academy of Management.

Valcour, M. (2007). Work-based resources as moderators of the relationship between work hours and satisfaction with work-family balance. *Journal of Applied Psychology*, *92*(6), 1512–1523. https://doi.org/10.1037/0021-9010.92.6.1512

Van den Noortgate, W., López-López, J. A., Marín-Martínez, F., & Sánchez-Meca, J. (2013). Three-level meta-analysis of dependent effect sizes. *Behavior Research Methods*, *45*(2), 576–594. https://doi.org/10.3758/s13428-012-0261-6

Vevea, J. L., & Woods, C. M. (2005). Publication bias in research synthesis: Sensitivity analysis using A priori weight functions. *Psychological Methods*, *10*(4), 428–443. https://doi.org/10.1037/1082-989X.10.4.428

Viechtbauer, W. (2010). Conducting meta-analyses in*R*with themetaforPackage. *Journal of Statistical Software*, *36*(3), 1–48. https://doi.org/10.18637/jss.v036.i03

Viechtbauer, W., & Cheung, M. W.-L. (2010). Outlier and influence diagnostics for meta-analysis. *Research Synthesis Methods*, *1*(2), 112–125. https://doi.org/10.1002/jrsm.11

Voydanoff, P. (2005). Toward a conceptualization of perceived work-family fit and balance: A demands and resources approach. *Journal of Marriage and Family*, *67*(4), 822–836. https://doi.org/10.1111/j.1741-3737.2005.00178.x

Wayne, J. H., Grzywacz, J. G., Carlson, D. S., & Kacmar, K. M. (2007). Work-family facilitation: A theoretical explanation and model of primary antecedents and consequences. *Human Resource Management Review*, *17*(1), 63–76. https://doi.org/10.1016/j.hrmr.2007.01.002.

Xanthopoulou, D., Sanz-Vergel, A. I., & Demerouti, E. (2014). Reconsidering the daily recovery process: New insights and related methodological challenges. In S. Leka, & R. R. Sinclair (Eds.), *Contemporary occupational health psychology: Global perspectives on research and practice, Vol. 3)* (pp. 51–67). Wiley Blackwell.