This is an unedited manuscript published in the *Journal of Applied Psychology*. Please note that the published version underwent minor additional editing in style and content.

Please cite as:

von Allmen, N., Hirschi, A., Burmeister, A., & Shockley, K. M. (2023). The effectiveness of work–nonwork interventions: A theoretical synthesis and meta-analysis. *Journal of Applied Psychology*. Advance online publication. https://doi.org/10.1037/apl0001105

The Effectiveness of Work-Nonwork Interventions: A Theoretical Synthesis and Meta-Analysis

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This research was supported by a research grant awarded to Andreas Hirschi by the Swiss State Secretariat for Education, Research and Innovation (SERI). The funding source had no involvement in study design, in the collection, analysis and interpretation of data, in the writing of the report, or in the decision to submit the article for publication. Some aspects of this research were presented within a poster presentation at the 13th Conference of the European Academy of Occupational Health Psychology (2018).

Abstract

A growing body of intervention studies is concerned with improving the work-nonwork interface. Extant work-nonwork interventions are diverse in terms of content and effectiveness. We map these interventions onto work-nonwork theories that explain why the interventions should improve proximal work-nonwork outcomes (i.e., conflict, enrichment, balance). Our resulting integrative framework suggests that interventions can affect work-nonwork outcomes via distinct mechanisms, which can be delineated according to their (a) *content valence* (i.e., increasing resources/positive characteristics or decreasing demands/negative characteristics; (b) *locality* (i.e., personal or contextual factors); and (c) *domain* (i.e., work, the nonwork, or the boundary-spanning). We further provide a meta-analytic review of the efficacy of such interventions based on 6,680 participants within 26 pre-post control group design intervention studies. The meta-analytic results reveal an overall significant main effect across all identified interventions for improving proximal work-nonwork outcomes. When comparing different kinds of interventions aimed at increasing resources, we found beneficial effects for interventions targeting personal resources over contextual resources and interventions in the nonwork domain compared to interventions in the work or boundary-spanning domain. We conclude that work-nonwork interventions effectively improve the work-nonwork interface and discuss theoretical and practical implications of the more substantial effects and potential advantages of interventions aimed at enhancing personal resources in the nonwork domain. Finally, we provide concrete recommendations for future research and elaborate on the type of studies we would like to see in terms of interventions targeting the reduction of demands, for which we found only a limited number of studies.

Keywords: work-nonwork; work-family; interventions; resources; demands

The Effectiveness of Work-Nonwork Interventions: A Theoretical Synthesis and Meta-Analysis

Successfully managing work and nonwork roles is vital to employees and employers (e.g., Shockley, 2018). Several interventions have been developed and tested to improve the work-nonwork interface, with different areas of focus, including teaching employees skills, such as mindfulness techniques (e.g., Michel et al., 2014), coping strategies (e.g., Malkinson et al., 1997), or stress management practices (e.g., Liossis et al., 2009). Other interventions focus on contextual factors such as enhancing flexibility and autonomy in working times and locations (e.g., Albertsen et al., 2014; Nijp et al., 2016) or improving family-supportive supervisor behaviors (e.g., Kelly et al., 2014). We define work-nonwork interventions as any intervention, program, or change with a goal of enhancing the work-nonwork interface.

To date, intervention studies provide conflicting results regarding the effectiveness of such interventions, and existing reviews that aim to synthesize results (Brough & O'Driscoll, 2010; Hammer et al., 2016; Kelly et al., 2008; Ropponen et al., 2016) are limited in several ways. First, existing narrative reviews are generally not well integrated with theory. That is, there is little incorporation of the theoretical frameworks that guide different interventions, and this lack of focus makes it difficult to understand precisely *why* interventions should have favorable effects on work-nonwork outcomes. Understanding why interventions work from a theoretical standpoint is critical for both creating and tweaking interventions in the future as well as for theory testing and refinement. To address this issue, we herein present an integrative theoretical framework that helps to clarify the mechanisms by which different types of interventions can affect the work-nonwork interface. Our framework integrates multiple dominant work-nonwork theories (Table 1), by deciphering core mechanisms (Figure 1; Table 2) in terms of their (a) *content valence* (i.e., increasing resources/positive characteristics of life roles or decreasing demands/negative characteristics of life roles), (b) *locality* (i.e., personal or contextual), and (c) *domain* (i.e., work, nonwork, boundary-spanning). We organize existing work-nonwork interventions into our theoretical framework to better understand the theoretical mechanisms used in existing intervention studies.

Second, extant reviews are not fully comprehensive in nature. They tend to examine only work-nonwork interventions that focus on changing contextual factors, such as flexibility policies (e.g., Hammer et al., 2016; Kelly et al., 2008), while neglecting interventions focusing on personal factors, such as skills. In the current review, we build upon our integrative framework to provide a more comprehensive overview of a broader range of

work-nonwork interventions. In doing so, our research provides an important starting point for the conversation on comparative effectiveness of different types of interventions.

Third, primary intervention studies have included a variety of outcomes – from proximal outcomes that directly assess the intersection of work and nonwork (work-family conflict, enrichment, or balance) to more distal outcomes (e.g., turnover, performance, well-being). While changes in proximal outcomes provide an answer regarding intervention effectiveness, changes in distal outcomes might only be indirectly affected by interventions through proximal outcomes (Nielsen et al., 2010). In the current review, we thus focus explicitly on intervention studies examining proximal work-nonwork outcomes: work-nonwork[1] conflict (when the demands of life roles are mutually incompatible in some way; Greenhaus & Beutell, 1985), enrichment (when experiences in one role improve the quality of life in other roles; Greenhaus & Powell, 2006), or balance (the extent to which individuals evaluate the combination of work and nonwork roles as satisfying; Casper et al., 2018).

Finally, existing reviews of work-nonwork interventions are all narrative and thus do not provide a quantitative, or meta-analytic, estimate of the effectiveness of work-nonwork interventions. This is an essential oversight in that it is difficult to gain a true sense of the efficacy of interventions with a narrative review insofar as sample sizes are generally not considered. Meta-analysis is also advantageous in detecting heterogeneity of effects and testing for boundary conditions that may help explain such heterogeneity. Additionally, previous reviews have not consistently differentiated the quality of the intervention study designs (e.g., the existence of a control group), which can contribute to conflicting results. Although numerous designs exist across published studies, experimental designs with pre-and post-intervention measurement and a control group provide the most precise test of intervention effectiveness and allow for causal inference. We herein address this issue by meta-analytically evaluating the effect sizes of intervention studies that used a controlled, pre-posttest study design, measuring a proximal work-nonwork outcome. We further group interventions by the theoretical mechanisms to allow comparison across types (where *k* is sufficient). This contributes to a better understanding of how work-nonwork interventions function and allows future researchers to make more informed decisions on which interventions may be most fruitful. In doing so, our research also provides a starting point for the conversation on comparative effectiveness of different intervention mechanisms.

Integrative Theoretical Framework to Explain the Effects of Work-Nonwork Interventions

Qualitative reviews have concluded that work-nonwork interventions can improve the work-nonwork interface (Brough & O'Driscoll, 2010; Hammer et al., 2016; Kelly et al., 2008; Ropponen et al., 2016). The current paper aims to go beyond establishing that various interventions are generally effective and provide more insight into the mechanisms by which these interventions work. A challenge in the existing literature is that interventions used various methods to improve the work-nonwork interface. These include such diverse approaches as enhancing knowledge of participants and teaching techniques, skills, and strategies as well as knowledge in dealing with work-nonwork challenges, teaching relaxation and mindfulness techniques, physical training, supervisor training, increased workplace flexibility in terms of flexibility in work location or schedule flexibility, or reducing or changing work hours. This range of intervention approaches makes it hard to obtain a more integrative understanding of what type of interventions produce which effects. Moreover, the theoretical mechanisms underlying such potential effects are often not clearly discussed or draw on a range of theoretical perspectives, making it hard to understand why work-nonwork interventions work.

To address these issues and arrive at an integrative theoretical understanding of how work-nonwork interventions can affect outcomes, we reviewed all the eligible primary studies (see Method section below for details) and identified the theories that the authors explicitly mentioned as the basis for the intervention. Extending beyond theories explicitly mentioned in these studies, we also combed the existing literature for theories that might be relevant by examining review pieces summarizing work-nonwork theories (Greenhaus & ten Brummelhuis, 2013; Matthews et al., 2016) as well as known stand-alone theories. We then evaluated each theory that came out of this process on whether (a) it is a theory that is specifically related to work-nonwork conflict, enrichment, and/or balance, (b) it explains the process by which these outcomes occur, and (c) the proposed processes would be amenable to some intervention-induced change. We then grouped the final selection of theories according to Greenhaus and ten Brummelhuis (2013)'s grouping of theoretical perspectives that focus primarily on conflict, enrichment, boundary management, decision-making, or ecological systems, plus the integrative work-home resources model (ten Brummelhuis & Bakker, 2012).

We then reviewed the selected theories for commonalities (Table 1). While they differ in important ways (e.g., the dominant outcomes they focus on, the specific processes that they propose), our review suggests that different perspectives converge in their general focus on

resources–"those entities that either are centrally valued in their own right (e.g., self-esteem, close attachments, health, and inner peace) or act as a means to obtain centrally valued ends (e.g., money, social support, and credit)" (Hobfoll, 2002, p. 307) and *demands*–"structural or psychological claims associated with role requirements, expectations, and norms to which individuals must respond or adapt by exerting physical or mental effort" (Voydanoff, 2004, p. 398). Resources and demands are thus useful general concepts to differentiate the theoretical functioning of different intervention approaches (e.g., increasing flexibility vs. reducing work hours). However, they are also very broad and subsume an extensive range of more specific cognitive, emotional, or physical aspects (de Jonge & Dormann, 2006).

To provide deeper insight into why interventions work, we thus aimed to differentiate further which type of resources and demands can theoretically explain the effectiveness of work-nonwork interventions. Our review of theoretical frameworks showed that different theories further differentiate resources and demands in terms of their locality as residing in either the person or the context (Table 1). This allows for an important distinction between different intervention approaches (e.g., teaching skills vs. increased workplace flexibility) and corresponding theoretical mechanisms that can explain their effects.

Finally, to provide an even more fine-grained distinction, we identified that different theoretical perspectives situate resources and demands in different domains regarding work, nonwork, or boundary-spanning (Table 1). This distinction addresses the critical point that the work-nonwork interface occurs across different life roles and that interventions can theoretically focus more on one role than another (e.g., teaching communication skills for work vs. with a life partner; dealing with stressors at work vs. general relaxation technique). As a result of this analysis, we propose an integrative framework: a 2 (content: increasing resources vs. decreasing demands) x 2 (locality: personal vs. contextual) x 3 (domain: work, nonwork, or boundary-spanning) matrix (see Table 2; Figure 1).

Increasing Resources and Reducing Demands

Although there are differences in how resources function across different theoretical models, the notion that an increase in resources will (a) reduce work-nonwork conflict, (b) increase work-nonwork enrichment, and (c) increase work-nonwork balance is prevalent in numerous frameworks (Table 1). The core underlying idea regarding conflict is that resources can help people deal with demands by either directly reducing these demands or helping in coping. When demands (or the strain reactions to demands) are reduced, conflict is likewise reduced. Resources facilitate enrichment because for one domain to affect the other positively, one must have high functioning, positive emotions, skill development, and growth.

Resources, by definition, contribute to such experiences. By facilitating meeting role demands and effective functioning across roles, the availability of resources also leads to a sense of balance effectiveness and satisfaction across different roles.

Similarly, demands are noted as a critical driver of work-nonwork outcomes, most commonly with conflict (Bakker & Geurts, 2004; Edwards & Rothbard, 2000; Michel et al., 2011; ten Brummelhuis & Bakker, 2012), but also with enrichment (ten Brummelhuis & Bakker, 2012; Voydanoff, 2008), and balance (Grawitch et al., 2010; Voydanoff, 2005). Various frameworks focus on different demands, but the general theoretical idea remains consistent: demands require sustained effort, energy, time, or attention, which can ultimately drain resources, leaving one with less ability to deal with competing demands across domains and increasing conflict. Moreover, the lack of resources results in less opportunity for work and family roles to enrich one another. Also, balance between life domains becomes more challenging when demands compete for personal resources across roles and are too high to be effectively met by the available resources. On a general level, existing research and theories thus suggest that interventions which increase resources or decrease demands should be effective in improving the work-nonwork interface.

Differentiating Between Personal and Contextual Resources and Demands

Some theoretical models further differentiate between resources and demands as either situated within the person or in the context (Grawitch et al., 2010; ten Brummelhuis & Bakker, 2012; Wayne et al., 2007). Personal resources (e.g., physical, psychological) originate from within the individual, while contextual resources (e.g., social support, autonomy) arise from the social context (ten Brummelhuis & Bakker, 2012). Increasing personal and contextual resources reduces role conflict by virtue of providing greater means to deal with role demands (Michel et al., 2011; ten Brummelhuis & Bakker, 2012) and leads to facilitation processes (through positive emotional states and the opportunity for growth and development) (Wayne et al., 2007). Personal and contextual resources have also been associated with balancing different life roles (by facilitating functioning and satisfaction across roles) (Grawitch et al., 2010; Voydanoff, 2005).

Contextual demands encompass the overload, physical, emotional, and cognitive role requirements placed upon individuals—for example, the necessity to work overtime or care for children (ten Brummelhuis & Bakker, 2012). Personal demands refer to psychological role involvement, role centrality, and personal preferences (Grawitch et al., 2010; Michel et al., 2011) as well as internalized role expectations and personal role performance standards (Hirschi et al., 2019). More contextual and personal demands lead to greater conflict between

life domains (Michel et al., 2011) and have been associated with reduced work-nonwork balance (Grawitch et al., 2010) because they make successfully engaging in multiple roles more difficult. We also expect increased enrichment following a reduction of personal and contextual demands, as fewer demands may lead to less personal resource drain and thus keep personal resources more available for use in other roles (ten Brummelhuis & Bakker, 2012).

Based on the theoretical and empirical considerations discussed above, increasing personal and contextual resources and reducing personal and contextual demands should all be effective mechanisms to improve the work-nonwork interface. However, it remains an open question if interventions differ in effectiveness, depending on the specific type of resources or demands they focus on.

Hypothesis 1: Compared to control groups, experimental groups undergoing a work-nonwork intervention aimed at increasing (a) personal and (b) contextual resources report improved work-nonwork outcomes (i.e., conflict, enrichment, balance).

Hypothesis 2: Compared to control groups, experimental groups undergoing a work-nonwork intervention aimed at reducing (a) personal and (b) contextual demands report improved work-nonwork outcomes (i.e., conflict, enrichment, balance).

Research Question 1: Is there a difference in effectiveness between work-nonwork interventions aiming to (a) increase personal vs. contextual resources or (b) reduce personal vs. contextual demands?

Differentiating Between Work, Nonwork, and Boundary-Spanning Domains

A third dimension to distinguish and synthesize demands and resources across theoretical frameworks is to differentiate them according to their origin in the work, nonwork, or boundary-spanning domain. Boundary-spanning was originally defined by Voydanoff (2004) as “aspects of work and family roles that directly address how work and family connect with each other” (p. 401); in an attempt to offer more precision to this definition, we describe boundary-spanning demands and resources as those that do not originate in either domain but can permeate both (e.g., self-compassion) as well as those that originate in one domain but have a specific target in the other domain (e.g., family-supportive supervision; work-supportive family) [2].

Theoretically, demands and resources are thought to play a unique role based on their origin. That is, several frameworks (Frone et al., 1992; Frone et al., 1997; Voydanoff, 2004). argue that the domain where demands/resources originate determines the direction of work-nonwork interactions that they primarily impact (i.e., a reduction in work demands would especially reduce work-to-nonwork conflict and enhance work-to-nonwork enrichment versus

outcomes in the nonwork-to-work direction). However, empirical work has not consistently supported this idea; for example, a meta-analysis of antecedents to work-family conflict found relationships of similar magnitude between family stressors (i.e., demands) and family support and both directions of conflict (Michel et al., 2011).

Based on this, we deem it important to examine if the origin of the demands/resources matters in terms of efficacy in impacting different outcomes (those targeted at family primarily help family-to-work conflict/enrichment; boundary spanning primarily helps balance as a non-directional outcome) or if there is one domain that is generally more efficacious across multiple work-nonwork outcomes. Doing so will contribute to practical knowledge and provide further evidence for or against existing theoretical ideas that incorporate domain relevance.

Hypothesis 3: Compared to control groups, experimental groups undergoing a work-nonwork intervention aimed at increasing resources in the (a) work, (b) nonwork, and (c) boundary-spanning domain report improved work-nonwork outcomes. (i.e., conflict, enrichment, balance).

Hypothesis 4: Compared to control groups, experimental groups undergoing a work-nonwork intervention aimed at reducing demands in the (a) work, (b) nonwork, and (c) boundary-spanning domain report improved work-nonwork outcomes (i.e., conflict, enrichment, balance).

Research Question 2: Is there a difference in effectiveness between work-nonwork interventions targeting resources or demands in the work vs. nonwork vs. boundary-spanning domain?

Method

Transparency and Openness

We describe our literature search, study exclusions, and all measures in the study, and we adhered to the Journal of Applied Psychology methodological checklist. All data can be assessed by contacting the corresponding author. Data were analyzed using comprehensive meta-analysis (CMA) (Borenstein et al., 2019). The study's design and its analysis were not preregistered.

Search Strategy and Inclusion Criteria

To obtain relevant studies, we first searched the title, abstract, and keywords of articles in the Web of Science database from 1900-2021, using a combination of the keywords: "work-nonwork", "work-to-nonwork", "nonwork-to-work", "work-family", "work-to-family", "family-to-work", "work-home", "work-to-home", "home-to-work", "work-life" and

"intervention", "training", workshop", "counseling", "experiment", "coaching", "initiative", "program". After screening 5,001 hits for fit based on the title and abstract, we included 228 articles for further review.

We applied six eligibility criteria on the basis of Lipsey and Wilson (2001): the study had to (1) report an intervention to improve the work-nonwork interface; (2) include an outcome variable proximal to the work-nonwork interface (i.e., conflict, enrichment, balance); (3) apply an experimental (experimental, quasi-experimental, naturally occurring, or pre-experimental) (Campbell & Stanley, 1966) pre-posttest study design, including random or non-random assignment to treatment and control groups; (4) examine nonclinical working adults; (5) be published in English as a journal article, doctoral dissertation, or book chapter; and (6) have no redundant data with other eligible studies. We thereby excluded 183 studies, resulting in 45 unique samples and interventions. For the meta-analysis, we had to exclude an additional 19 papers (rationale is detailed in Figure 2 in the PRISMA chart), resulting in a final sample of 26 samples and interventions with 6,680 participants across 25 studies. To account for directionality, we ran separate analyses for work-to-nonwork and nonwork-to-work when measuring conflict and enrichment. We meta-analytically computed effects sizes for outcomes with at least three studies and thus had to exclude nonwork-to-work enrichment from all analyses ($k = 2$).[3] An overview of all included studies can be found in the supplemental material (Table S1).

Coding of Studies

We coded each intervention based on its description into targeting (a) increasing resources vs. reducing demands, (b) personal vs. contextual demands/resources, and (c) focusing on the work vs. nonwork vs. boundary-spanning domain. Coding was done by the full author team and results were discussed to reach a consensus. The raters showed high interrater agreement with $K = .87$ to .90. Disagreements were resolved by discussion and re-examination of primary studies. Statistical information was coded in terms of means, standard deviations, analyzed sample size, and correlations for all available work-nonwork measures and time points among the experimental and control groups.

Analytic Model of Meta-Analysis

We used comprehensive meta-analysis (CMA) (Borenstein et al., 2019) to calculate effect sizes, perform group comparisons, and conduct moderator analyses. Because the interventions were diverse in their content and sample characteristics, we did not assume a common effect size underlying all studies and used random effects models in our analyses (Borenstein et al., 2007). We focused on studies that used a pretest-posttest control group

design (Morris, 2007), taking into account possible group differences before the intervention. The effect size is described as the standardized mean difference between the intervention and control group (Lipsey & Wilson, 2001). The standardized mean difference, calculated based on the means and standard deviations of the individual studies (Lipsey & Wilson, 2001), allows to control for dependent variables being measured with different scales across the studies (Lakens, 2013). For the post-intervention scores, the first time point of measurement after the end of the entire intervention was used. In cases where pre- and post-scores were reported, but the pre-post correlation was missing, we used the mean correlation between pre- and post-scores across all studies to replace missing values, a procedure that has been used in other meta-analyses with a similar design (Paul et al., 2007; Ruotsalainen et al., 2015)[4]. To explore differences in effectiveness, we conducted group comparisons for interventions coded as focusing on personal vs. contextual demands/resources, and work vs. nonwork vs. boundary-spanning domain.

Meta-Analytic Results

General Effectiveness

The meta-analysis included 6,680 participants across 26 studies (Table 3; supplementary Table S1). The main results are depicted in Figure 1. Regarding the *main effect of interventions* (Table 4; Figure 3), we found that all four proximal work-nonwork outcomes (i.e., work-to-nonwork conflict, nonwork-to-work conflict, work-to-nonwork enrichment, work-nonwork balance) were more favorable in the experimental groups compared to the control groups. A potential publication bias for nonwork-to-work conflict, that might have inflated the published mean effect size, is hard to interpret given the low study number (k = 11). Interventions aiming to *increase resources* showed significant positive effects for all four proximal work-nonwork outcomes (Table 5). Because only two intervention studies focused on *reducing demands*, we could not meta-analytically test their effect for any outcomes. However, the findings from these individual studies are summarized in Table 6.

Personal vs. Contextual Resources and Demands

Interventions *increasing personal resources* (Table 4) showed significant intervention effects for improving work-to-nonwork conflict, nonwork-to-work conflict, work-nonwork balance. No significant effects were found for improving work-to-nonwork enrichment. The results thus generally support for Hypothesis 1a. Interventions *increasing contextual resources* were ineffective compared to a control group for reducing work-to-nonwork conflict. Other outcomes could not be tested meta-analytically, but are described qualitatively in Table 6. Thus, Hypothesis 1b was not supported in what could be tested meta-analytically.

Interventions *reducing personal demands* were unavailable, meaning Hypothesis 2a could not be tested, and there were an insufficient number of studies to test *reducing contextual demands*, meaning Hypothesis 2b could not be tested.

Addressing Research Question 1, the results showed that interventions *increasing personal resources* showed larger effects than those aimed at *increasing contextual resources* (Table 5, Figure 4) for reducing work-to-nonwork conflict. The number of studies investigating increasing contextual resources was too low to conduct group comparisons for other work-nonwork outcomes (see Table 6 for a qualitative summary). We could not address Research Question 1b, and compare interventions aimed at reducing personal vs. contextual demands because existing studies aimed solely at contextual demands.

Work, Nonwork, and Boundary-Spanning Domains

Hypothesis 3 focused on work-nonwork intervention aimed at increasing resources in the (a) work, (b) nonwork, and (c) boundary-spanning domains. Interventions *increasing resources in the work domain* showed greater effectiveness than the control group for reducing work-to-nonwork conflict and improving work-nonwork balance (Table 4). A qualitative summary of findings for nonwork-to-work conflict and work-to-nonwork enrichment are presented in Table 6. Interventions *increasing resources in the nonwork domain* showed significant positive effects for reducing work-to-nonwork conflict and nonwork-to-work conflict (Table 4). There were no studies measuring work-to-nonwork enrichment or balance. Interventions *increasing resources in the boundary-spanning domain* did not show effectiveness compared to control groups for reducing work-to-nonwork conflict but did for nonwork-to-work conflict (Table 4). Overall, the results support Hypothesis 3a for work-to-nonwork conflict and work-nonwork balance, 3b for both conflict directions, and 3c, for nonwork-to-work conflict.

Because only two intervention studies focused on *reducing demands in the work domain*, we could not meta-analytically test Hypotheses 4a-c referring to differentiated effects in the work, nonwork, and boundary-spanning domains (Figure 3), but summaries of individual study findings are presented in Table 6.

Addressing Research Question 2, the results showed that interventions *increasing resources in the nonwork domain* showed greater effectiveness in improving work-to-nonwork conflict than those *increasing resources in the work or boundary-spanning domain* (Table 5 and Figure 5). However, there was no significant difference between the work and boundary-spanning domain. Interventions *increasing resources in the nonwork domain and boundary-spanning domain* did not differ in their effectiveness in reducing nonwork-to-work

conflict. The number of studies was too low to conduct group comparisons for other work-nonwork outcomes. All interventions reducing demands targeted the work domain, thus we could not address Research Question 2 regarding demands.

Discussion

By identifying critical mechanisms proposed across prominent work-nonwork theories, we introduced an integrative theoretical framework addressing why existing work-nonwork interventions can improve the work-nonwork interface. While our framework does not make predictions about which specific type of intervention is most effective, it provides a starting point for systematically categorizing, assessing, and comparing the effectiveness of different interventions for various work-nonwork outcomes. Specifically, we found the largest effect sizes to reduce work-to-nonwork conflict for interventions that aimed to increase personal and nonwork resources. On the other hand, the effectiveness of interventions aimed at contextual and boundary-spanning demands had little effect on work-to-nonwork conflict. Regarding nonwork-to-work conflict and balance, three effect sizes were tested; they were similar across personal and nonwork domain resources and smaller for boundary-spanning resources. Lastly, effect sizes were also similar for those that could be tested for balance (personal and work domains). Other notable findings were that interventions focusing on reducing demands, especially personal demands, were largely absent from the literature, as were those focused on both forms of enrichment, especially the nonwork-to-work direction, limiting the potential for comparative analyses.

Theoretical and Practical Implications

There are several theoretical implications of our review. In addition to the stand-alone contribution of providing integration of theory relevant to interventions, the mapping of intervention studies onto specific categories sheds light on the current theoretical state of the literature, allowing us to highlight areas where (a) previous theoretical assumptions are not clearly supported, (b) previous theoretical assumptions are relevant, and (c) additional research is needed to test theory.

We found two main areas where some previous theoretical assumptions were not clearly supported. First, the finding that nonwork resources had a more significant impact than work resources on work-to-nonwork conflict is counter to the ideas of domain-specificity (Amstad et al., 2011; Shockley & Singla, 2011). This could imply that this basic idea may not carry over to intervention effects–although why that would be the case given the general patterns found in meta-analytic work regarding domain-specific resources and conflict (Michel et al., 2011) is unclear. On the other hand, this pattern could suggest greater support

for the role of a more general, individual-based pool of resources, such as time and energy, as implicated in (Grawitch et al., 2010) and the work-home resource model (ten Brummelhuis & Bakker, 2012). These frameworks both suggest that an individual's resource supply (and the allocation of those resources) is what is most proximally determines work-nonwork outcomes. Thus, the pattern we observed may be highlighting that nonwork resources (vs. work resources) are more influential on personal resources, and it is through this mechanism that effects on work-nonwork outcomes are observed (versus resources in each domain affecting work-nonwork outcomes directly). We urge researchers to conduct a more fine-grained assessment of interventions through experience sampling designs, which would allow us to better tease apart this potential ripple of resources at various levels.

The second area relates to boundary-spanning resources, which showed non-significant (work-to-nonwork conflict) and small (nonwork-to-work conflict) effect sizes. Given that these resources span domains and are thus targeting both sides of the conflict equation, we might expect them to have more pervasive effects than single-domain resources, but this was not the case. In conducting our review, we realized the issue of conceptual confusion regarding precisely what constitutes a boundary-spanning resource or demand (see Footnote 2). While we tried to clarify the definition and accordingly adjust our coding scheme, the confusion of the term in the literature could be stunting theory development and literature synthesis. We urge researchers to move forward with our definition to provide greater distinction between the domain categories.

Previous theoretical assumptions were met regarding the differentiation between personal and contextual resources. For work-to-nonwork conflict, interventions aimed at increasing personal resources generally showed more substantial effects than increasing contextual resources. As noted above, the added benefit of personal over contextual resources could be explained in line with the work-home resources model (ten Brummelhuis & Bakker, 2012), which suggests that contextual resources affect work-nonwork outcomes primarily indirectly through their effects on personal resources. Personal resources would thus more proximally affect outcomes which might explain their added benefit. An advantage of personal resources is that they can be more easily transferred across contexts and roles, increasing their overall utility and impact on the work-nonwork interface. From a practical perspective, interventions focusing on personal resources benefit from these resources being more in the employee's control and thus amenable to change without relying on the company. On the other hand, this also burdens employees to self-manage their work-nonwork interface, which might pose additional demands. Future intervention research could thus focus more on

how different personal resources can be increased, how this interacts with contextual resources, and pay attention to the potential downsides and limitations of such interventions.

Our last key area of theoretical implications concerns intervention approaches we could not conclude about, given the dearth of studies. First, the lack of focus on demands is surprising because demands are often theoretically discussed as the primary driver of work-nonwork conflict (Bakker & Geurts, 2004), a concept which bears out meta-analytically as well (Michel et al., 2011). This questions why intervention studies have not taken this approach. The lack of published findings could be a file drawer issue (i.e., if interventions aimed at reducing demands are ineffective, they may be more challenging to publish). However, interventions to reduce demands might also be less practical, feasible, or even counterproductive, at least from the organization's point of view (e.g., organizations do not want to offer shorter work hours because of the belief that it will reduce output).

Regardless, we see the production of more empirical work devoted to these interventions as critical to testing theory and comparing different intervention mechanisms. Contextual factors may seem like the obvious choice when aiming to reduce demands, but focusing on personal demands (e.g., declining role expectations) is an important and promising approach for future intervention research. Future studies could target demands other than work time, such as reduced workload, interpersonal conflict at work or home, or unrealistic expectations, and pay special attention to how such interventions are perceived and implemented by organizations, including the potential barriers to their implementation.

Although we cannot directly compare resources and demands within our review, we note that several other streams of research could be integrated to better theorize about the differential impact of resources versus demands. For example, our knowledge base could benefit from incorporating ideas from Reinforcement Theory (Skinner, 2014). There may be differential effects when gaining resources is analogous to positive punishment and losing demands is equal to negative reinforcement. The reinforcement literature is quite nuanced (e.g., Nevin & Mandell, 2017) in terms of which method is more effective, but these ideas could help better inform our understanding of when and how to apply different strategies of interventions. Likewise, the body of research suggesting that adverse events and emotions have more potent effects than positive ones (Baumeister et al., 2001) would mean that reducing demands is a superior strategy.

Lastly, most of the insight we can draw relates to conflict as an outcome, as that was the most studied variable. Although resources are almost always implicated in theories of work-nonwork enrichment (Bakker & Geurts, 2004; Greenhaus & Powell, 2006; Wayne et al.,

2007), there were too few intervention studies on this outcome to dig deeper and understand which types of resources are most amenable to intervention effects. Having this information would help pinpoint which resources tend to impact the enrichment process the most and therefore serve to refine these theories, which to date are generally broad and include numerous types of resources, without much differentiation between their value theoretically. Similarly, balance has been established as an outcome with potentially unique antecedents (Casper et al., 2018; Wayne et al., 2017). However, few intervention studies targeted this outcome. More intervention research would be essential to refine theory on changing what type of resources and demands is especially beneficial to improve balance.

Additional big-picture practical implications stem directly from our findings regarding the specific theoretical mechanisms. With some caveats noted above, practitioners might want to focus on improving personal resources (e.g., stress management, mindfulness skills) and those in the nonwork domain (e.g., parenting skills). Notably, such interventions have some critical advantages. First, participation in personal resources interventions and those in the nonwork domain do not necessarily require involvement by supervisors. It thus could be undertaken by any employee aiming to enhance their work-nonwork interface regardless of their employer's support. Second, because personal resources interventions can have multiple modes of delivery (e.g., online interventions), their implementation shows greater flexibility, ease of implementation, and cost-effectiveness than changing contextual resources. Third, personal resources interventions and interventions in the nonwork domain are context-independent and thus can be implemented across different types of jobs and organizations (Allen & Martin, 2017), which increases the number of potential beneficiaries. We make these recommendations with explicit caution that our analysis did not review interventions explicitly targeting the intersection of personal and non-work resources; thus, we assume this combination is beneficial, but there could be potential unknown interactions.

Limitations and Conclusions

It is important to note a few limitations of our study. The included work-nonwork outcomes are measured via self-report, which can suffer from response biases. Future research could include external reports or behavioral measures as outcomes. We tested different theoretical mechanisms in terms of the focus of interventions by assuming that the change in different kinds of resources and demands is causing the change in work-nonwork outcomes. However, to thoroughly test the underlying causal mechanisms, we would also need to establish that an actual change in resources (e.g., increase in mindfulness or stress management skills) and demands (e.g., reduction of working time) occurred following the

intervention. Unfortunately, only a few existing intervention studies focused on such mechanisms, making this impossible to test and leaving somewhat of an empirical "black box" linking interventions with outcomes. We urge future researchers to measure changes in their theoretical mechanisms to help elucidate this issue.

Additionally, although we underwent a comprehensive search to find intervention studies, we cannot rule out the file drawer problem (i.e., studies with null results are less likely to be published). We did some analysis concerning publication biases, but given the low *k*, the effects are hard to interpret. As our science moves toward pre-registration and registered reports, this becomes less of a concern, given that there is great value in understanding which interventions work and do not work.

To conclude, our study shows that existing interventions fall within three general intervention approaches and use a range of intervention components within each approach. We meta-analytically showed the overall effectiveness of work-nonwork interventions for improving work-nonwork outcomes. However, not all interventions have the same effectiveness, as we uncovered differences within intervention approaches. In particular, interventions aiming at increasing individual resources are highly effective and should therefore be implemented more often. The reviewed interventions and their chosen approach should provide a valuable reference for any person or company aiming to improve the work-nonwork interface.

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Footnotes

[1] We use the term "work-nonwork" to refer to both directions (i.e., from work-to-nonwork and nonwork-to-work) and use the more specific terms "work-to-nonwork" and "nonwork-to-work" when referring to directional effects.

[2] Voydanoff (2005) lists several concrete examples of boundary-spanning demands and resources, including flexible work schedules, bringing work home, overnight travel, spouse employment, and parental leave. We note that these examples introduce ambiguity into what is truly boundary-spanning, as some, though not all, necessarily involve a connection between domains. For example, schedule flexibility is often considered a work resource, as it adds autonomy to the work domain, which may have a positive effect on family as a by-product, but this is not implied in the construct itself. Spouse employment is traditionally considered a family resource, and it is unclear how this would affect a person's work domain. To differentiate boundary-spanning demands and resources more clearly from those that originate in a specific domain and to offer more clarity on the construct itself, we offer the revised definition noted above.

[3] One study included several experimental groups with slightly different intervention content but only one comparison group. We included only the intervention group with the most intense intervention content (i.e., subgroup A for Nabe-Nielsen et al., 2011). In two other cases (i.e., Albertsen et al., 2014; Shen & Shockley, 2014), we included only the intervention group with the largest sample size because intervention contents were comparable in intensity across the experimental groups.

[4] Using the post-score standard deviation method, the correlation size did not influence the effect size estimation.

Table 1

Theoretical Perspectives in the Work-Nonwork Literature within the Synthesized Framework of Intervention Mechanisms

	Increase Resources					Decrease Demands				
	Locality		Domain			Locality		Domain		
	Person	Context	Work	Non-work	Boundary spanning	Person	Context	Work	Non-work	Boundary spanning
Conflict perspectives (Bakker & Geurts, 2004) (Edwards & Rothbard, 2000) (Marks, 1977) (Kahn et al., 1964) (Greenhaus & Beutell, 1985) (Michel et al., 2011)						*x*	*x*	*x*	*x*	
Enrichment perspectives (Greenhaus & Powell, 2006) (Barnett & Hyde, 2001) (Wayne et al., 2007)	*x*	*x*	*x*	*x*						
Boundary theory / Border theory (Ashforth et al., 2000; Clark, 2000; Nippert-Eng, 1996)	*x*				*x*					
Decision-making frameworks (Greenhaus & Powell, 2012; Poelmans, 2005; Powell & Greenhaus, 2012) (Kossek et al., 1999)	*x*				*x*	*x*				*x*

(Grawitch et al., 2010)										
Ecological systems perspectives (Hill, 2005; Voydanoff, 2002, 2005, 2008)			*x*	*x*	*x*			*x*	*x*	*x*
Work-home resources model (ten Brummelhuis & Bakker, 2012)	*x*	*x*	*x*	*x*			*x*	*x*	*x*	

Table 2

Synthesized Framework of Mechanisms by which Interventions can Improve the Work-Nonwork Interface

	Increasing Resources	Decreasing Demands
Work domain		
Personal	Interventions aiming at increasing personal resources at work (e.g., knowledge, skills, resilience) to facilitate dealing with work demands (*k*=6) e.g., mindfulness-based intervention, resilience program	Interventions aiming at decreasing personal demands at work (e.g., career expectations, unreachable goals) to facilitate dealing with work demands (*k*=0)
Contextual	Interventions aiming at increasing contextual resources at work (e.g., autonomy, flexibility) to facilitate dealing with work demands (*k*=6) e.g., telework. self-rostering	Interventions aiming at decreasing contextual demands at work (e.g., work time, work overload) to facilitate dealing with work demands (*k*=2) e.g., change of shift schedule, compressed work week
Nonwork domain		
Personal	Interventions aiming at increasing nonwork personal resources (e.g., mindfulness, parenting strategies, energy) to facilitate dealing with nonwork demands (*k*=5) e.g., mindfulness training, parenting workshop	Interventions aiming at decreasing nonwork personal demands (e.g., family expectations, personal standards, negative self-talk, exhaustion) to facilitate dealing with nonwork demands (*k*=0)

Contextual	Interventions aiming at increasing nonwork contextual resources (e.g., social support, financial support) to facilitate dealing with nonwork demands (*k*=0)	Interventions aiming at decreasing nonwork contextual demands (e.g., emotional conflicts, family pressure) to facilitate dealing with nonwork demands (*k*=0)
Boundary-spanning		
Personal	Interventions aiming at increasing boundary-spanning personal resources (e.g., resources awareness, resource transfer, management of multiple roles) to facilitate dealing with work and/or home demands (*k*=4) e.g., resource transfer training, managing work and parenting	Interventions aiming at decreasing boundary-spanning personal demands (e.g., emotional involvement, blurring boundaries) to facilitate dealing with work and/or home demands (*k*=0)
Contextual	Interventions aiming at increasing boundary-spanning contextual resources (e.g., family-supportive supervision) to facilitate dealing with work and/or home demands (*k*=3) e.g., family-supportive supervisor behaviour, STAR	Interventions aiming at decreasing boundary-spanning contextual demands (e.g., being on call to work during the weekend) to facilitate dealing with work and/or home demands (*k*=0)

Table 3

Sample Characteristics Across all Included Studies

	N = 26 Studies within Meta-Analysis				
	k	*M*	%	*Min*	*Max*
Age	19	39.1		30.5	45.0
Female	21		68.9	16.7%	100%
Married/Cohabiting	17		74.9	46.7%	100%
Parents	12		52.8	25.0%	100%
Work hours per week	12	43.4		31.1	59.6

Table 4

Results for Main Effects

Outcome	*k*	*N*	*SMD*	*SE*	95 % CI_{ES} LL	UL	Q
Overall							
Work-to-nonwork conflict	22	5979	-.27*	.07	-.40	-.14	92.37***
Nonwork-to-work conflict	11	1979	-.18*	.06	-.30	-.06	14.27
Work-to-nonwork enrichment	4	1019	.24*	.07	.10	.38	.86
Work-nonwork balance	7	1248	.25*	.06	.13	.37	4.49
Increasing Resources							
Work-to-nonwork conflict	20	5686	-.22*	.07	-.35	-.09	75.36***
Nonwork-to-work conflict	10	1794	-.21*	.07	-.34	-.07	13.25
Work-to-nonwork enrichment	4	1019	.24*	.07	.10	.38	.86
Work-nonwork balance	7	1248	.25*	.06	.13	.37	4.49
Personal							
Work-to-nonwork conflict	12	1615	-.37*	.08	-.52	-.22	19.3
Nonwork-to-work conflict	8	861	-.28*	.10	-.47	-.09	10.84
Work-to-nonwork enrichment	3	413	.22	.12	-.02	.45	.81
Work-nonwork balance	6	1071	.23*	.07	.10	.37	4.05
Contextual							
Work-to-nonwork conflict	8	3778	-.06	.08	-.23	.10	33.41***
Nonwork-to-work conflict	2	933					
Work-to-nonwork enrichment	1	606					
Work-nonwork balance	1	177					
Work domain							
Work-to-nonwork conflict	9	2395	-.23*	.08	-.39	-.07	19.28**
Nonwork-to-work conflict	1	126					
Work-to-nonwork enrichment	2	732					
Work-nonwork balance	6	1100	.25*	.07	.12	.38	4.47
Nonwork domain							
Work-to-nonwork conflict	5	463	-.52*	.10	-.71	-.32	.36
Nonwork-to-work conflict	5	463	-.25*	.12	-.48	-.02	5.30
Work-to-nonwork enrichment	0						
Work-nonwork balance	0						
Boundary-spanning domain							

Work-to-nonwork conflict	6	2828	-.05	.10	-.24	.15	21.21***
Nonwork-to-work conflict	4	1205	-.13*	.06	-.25	-.02	1.26
Work-to-nonwork enrichment	2	287					
Work-nonwork balance	1	148					
Reducing Demands							
Work-to-nonwork conflict	2						
Nonwork-to-work conflict	1						
Work-to-nonwork enrichment	0						
Work-nonwork balance	0						

Note. *SMD* < 0 indicates a favorable effect of the intervention for conflict outcomes, *SMD* > 0 indicates a favorable effect of the intervention for enrichment and balance outcomes. *SMD* = standardized mean difference; CI = confidence interval; Q = test statistic of heterogeneity. We analyzed the main effect for every intervention type and outcome with at least 3 studies per group. All interventions aiming at reducing demands targeted contextual demands in the work domain. * Indicates that the confidence interval does not include zero.

Table 5

Results for Group Comparisons for Interventions Aimed at Increasing Resources

	Moderator analysis		Statistics in subsamples				
						95 % CI_{ES}	
Variable	*Q* between	*p*	*k*	*SMD*	*SE*	LL	UL
Contextual vs. Personal							
Outcome: Work-to-nonwork conflict							
Interventions increasing resources	7.32*	.01					
Contextual resources			8	-.06	.08	-.23	.10
Personal resources			12	-.37	.08	-.52	-.22
Outcome: Nonwork-to-work conflict							
Interventions increasing resources							
Contextual resources			2				
Personal resources			8				
Outcome: Work-to-nonwork enrichment							
Interventions increasing resources							
Contextual resources			1				
Personal resources			3				
Outcome: Nonwork-work balance							
Interventions increasing resources							
Contextual resources			1				
Personal resources			6				
Domain							
Outcome: Work-to-nonwork conflict							
Interventions increasing resources in the domain	11.46*	.00					
Nonwork			5	-.52	.10	-.71	-.32

Work			9	-.23	.08	-.39	-.07
Boundary-Spanning			6	-.05	.10	-.24	.15
Outcome: Nonwork-to-work conflict							
Interventions increasing resources in the domain	.87	.35					
Nonwork			5	-.25	.12	-.48	-.02
Work			1				
Boundary-Spanning			4	-.13	.06	-.25	-.02
Outcome: Nonwork-to-work conflict							
Interventions increasing resources in the domain							
Nonwork			0				
Work			2				
Boundary-Spanning			2				
Outcome: Nonwork-to-work conflict							
Interventions increasing resources in the domain							
Nonwork			0				
Work			6				
Boundary-Spanning			1				

Note. *SMD* < 0 indicate a positive effect of the intervention for conflict outcomes, *SMD* > 0 indicate a positive effect of the intervention for enrichment and balance outcomes. *SMD* = standardized mean difference; CI= confidence interval. We conducted group comparisons for every outcome with at least 3 studies per group. * $p < .05$

Table 6

Qualitative Summaries of Findings where Hypotheses Could not be Tested

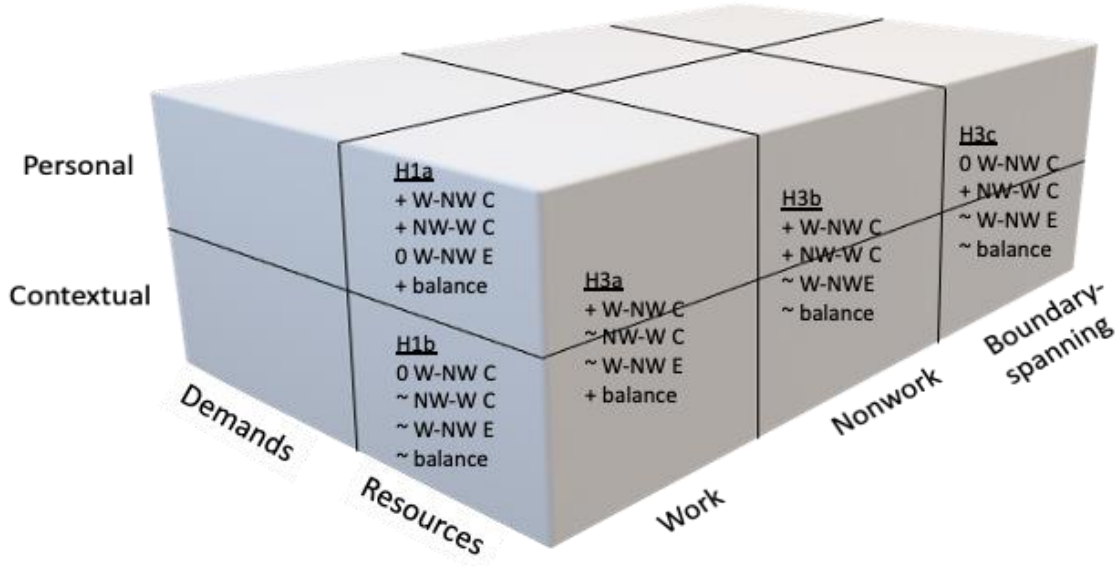
	Increasing Resources	Decreasing Demands
		Two studies testing work-to-nonwork conflict showed significant effects compared to the control groups (Dunham et al., 1987a, d = -0.80, 95% CI [-1.25, -0.36]; Karlson et al., 2009, *d* = -.62, 95% CI [-.93, -.32]) One study testing nonwork-to-work conflict showed no significant effects compared to the control group (Karlson et al., 2009, *d* = -0.03, 95% CI [-0.31, 0.25])
Locality		
Personal		
Contextual	*H1b* Two studies testing nonwork-to-work conflict showed no significant effects (Hammer et al., 2011, d = -0.04, 95% CI [-0.30, 0.21]; Kelly et al., 2014, d = -.15, 95% CI [-.30, .00]) One study testing work-to-nonwork enrichment showed significant effects (Albertsen et al., 2014, d = 0.25, 95% CI [0.07, 0.43])	*H2b* Two studies testing work-to-nonwork conflict showed significant effects (Dunham et al., 1987a, d = -0.80, 95% CI [-1.25, -0.36]; Karlson et al., 2009, *d* = -.62, 95% CI [-.93, -.32]) One study testing nonwork-to-work conflict showed no significant effects (Karlson et al., 2009, d = -0.03, 95% CI [-0.31, 0.25])

	One study testing work-nonwork balance showed significant effects (Pryce et al., 2006, d = 0.34, 95% CI [0.05, 0.64]) RQ1a: Two studies testing nonwork-to-work conflict (Hammer et al., 2011, d = -0.04, 95% CI [-0.30, 0.21]; Kelly et al., 2014, d = -.15, 95% CI [-.30, .00]) showed rather small effect sizes compared to interventions focusing on personal resources (d = -0.28, 95% CI [-0.47, -0.09], *k*=8) One study testing work-to-nonwork enrichment (Albertsen et al., 2014, d = 0.25, 95% CI [0.07, 0.43]) showed a comparable effect compared to interventions focusing on personal resources (d = 0.22, 95% CI [-0.02, 0.45], *k* =3) One study testing work-nonwork balance (Pryce et al., 2006, d = 0.34, 95% CI [0.05, 0.64]) showed a somewhat larger effect compared to interventions focusing on personal resources (*d* = 0.23, 95% CI [0.10, 0.37], *k*=6)	
Domain		
Work	H3a	H4a

	One study testing nonwork-to-work conflict showed significant effects (Liossis et al., 2009, d = -0.82, 95% CI [-1.35, -0.29]) Two studies testing work-to-nonwork enrichment showed mixed effects (Albertsen et al., 2014, d = 0.25, 95% CI [0.07, 0.43]; Liossis et al., 2009, d = 0.40, 95% CI [-0.12, 0.91])	Two studies testing work-to-nonwork conflict showed significant effects (Dunham et al., 1987a, d = -0.80, 95% CI [-1.25, -0.36]; Karlson et al., 2009, d = -0.62, 95% CI [-0.93, -0.32]) One study testing nonwork-to-work conflict showed no significant effects (Karlson et al., 2009, d = -0.03, 95% CI [-0.31, 0.25])
Nonwork Boundary-Spanning	H3c Two studies testing work-to-nonwork enrichment showed no significant effects (Heskiau & McCarthy, 2020, d = 0.22, 95% CI [-0.12, 0.56]; Shen & Shockley, 2014, d = 0.09, 95% CI [-0.33, 0.51]) One study testing work-nonwork balance showed no significant effects (Nicklin et al., 2022, d = 0.27, 95% CI [-0.05, 0.60])	

Figure 1

Integrative Framework of Theoretical Mechanisms for Work-Nonwork Interventions



Note. H2a, H2b, H4a, H4b, H4c could not be tested due to insufficient number of studies. 0: no significant intervention effects; + : a favorable intervention effect; ~ : the relationships could not be tested. W-NW C: work-nonwork conflict; NW-W C: nonwork-work conflict; W-NW E: work-nonwork enrichment

Figure 2

PRISMA Flow Diagram of Study Inclusion Process

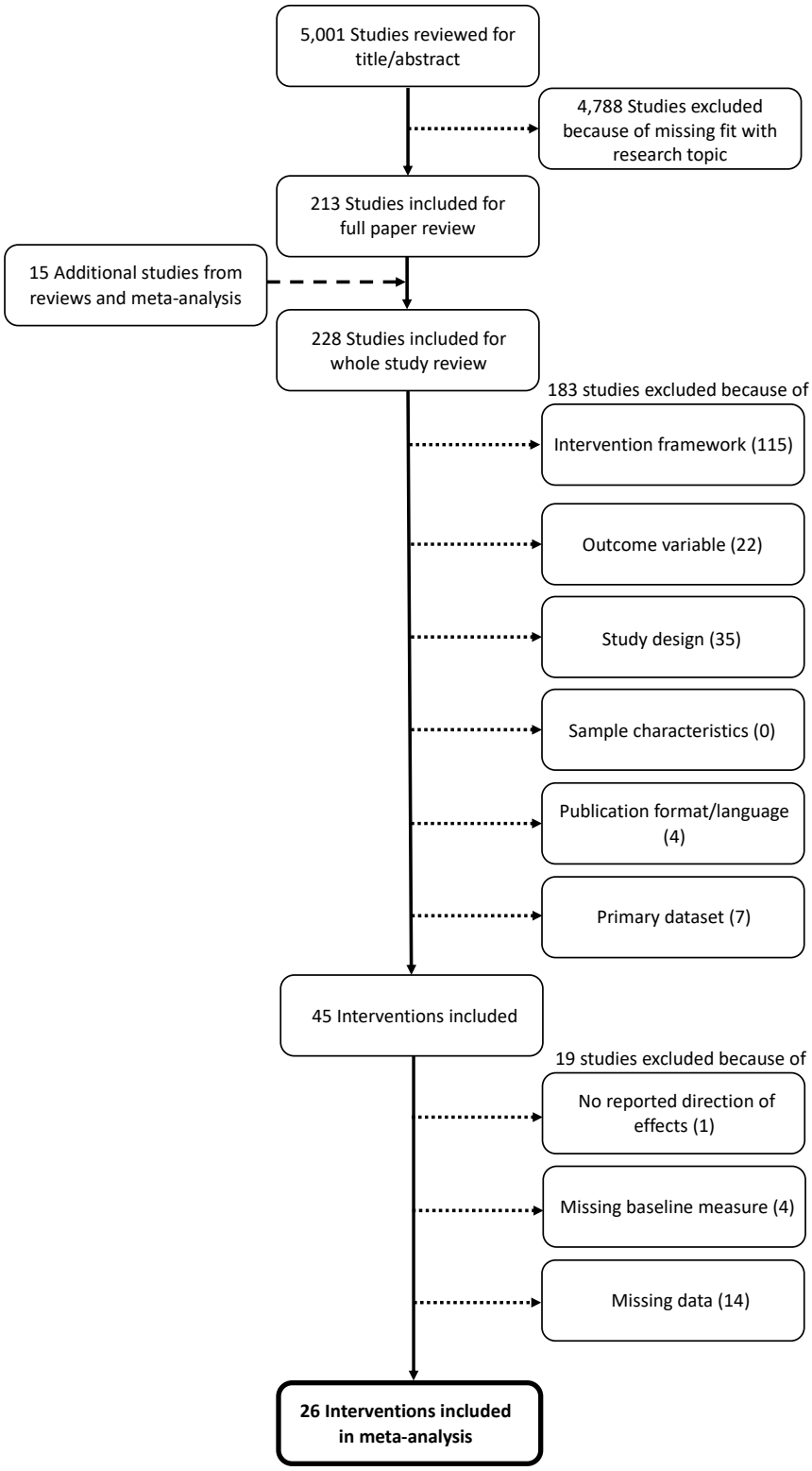


Figure 3

Overall Effectiveness in Improving Work-Nonwork Outcomes

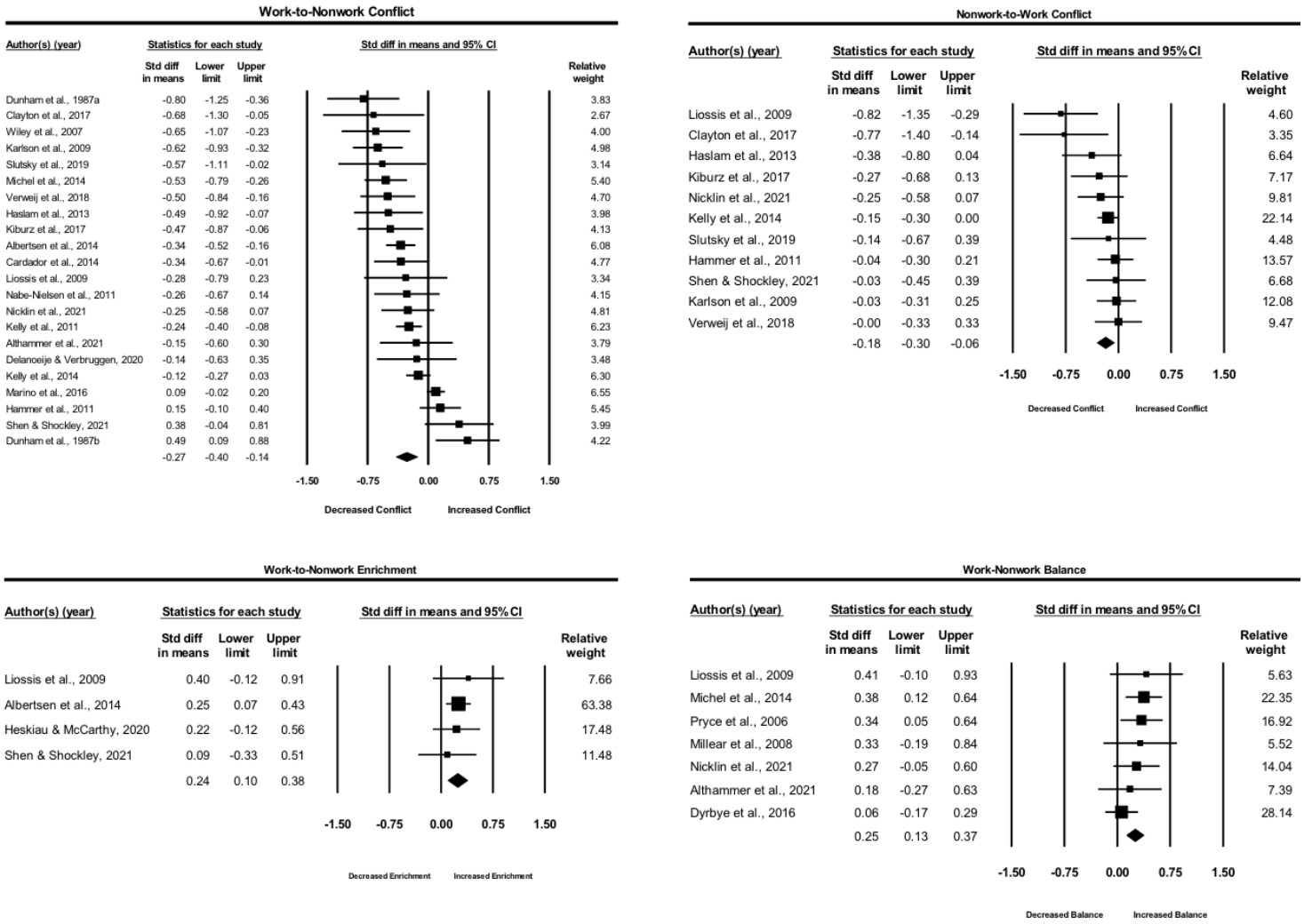
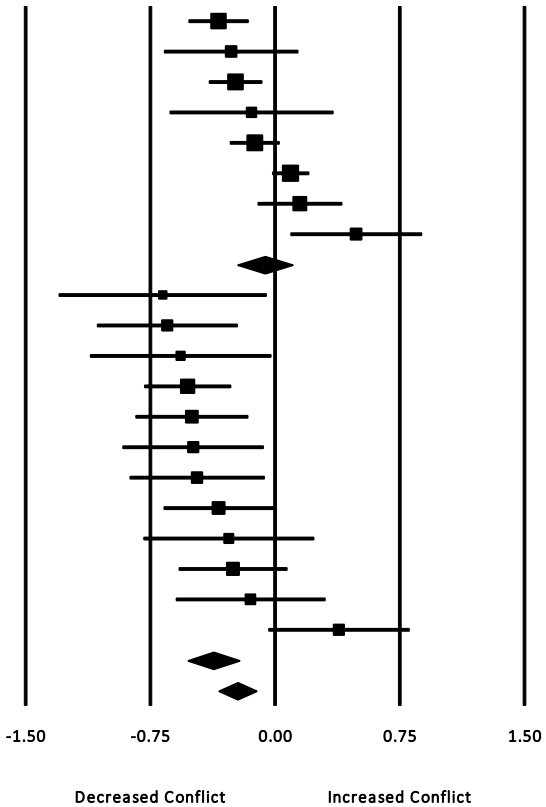


Figure 4

Effectiveness in Decreasing Work-to-Nonwork Conflict for Interventions Increasing Contextual Resources vs. Personal Resources

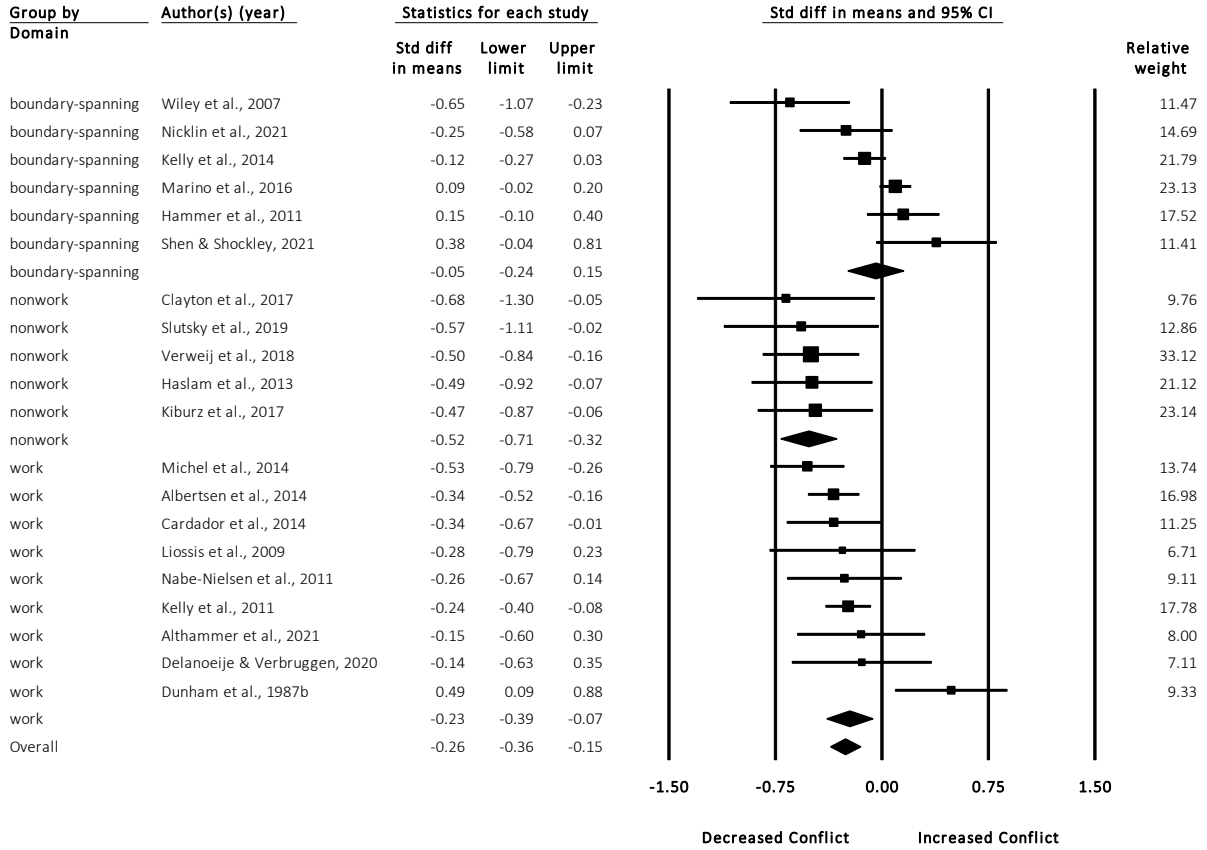
Group by Personal vs. Contextual	Author(s) (year)	Statistics for each study: Std diff in means	Lower limit	Upper limit	Relative weight
contextual	Albertsen et al., 2014	-0.34	-0.52	-0.16	14.91
contextual	Nabe-Nielsen et al., 2011	-0.26	-0.67	0.14	8.64
contextual	Kelly et al., 2011	-0.24	-0.40	-0.08	15.50
contextual	Delanoeije & Verbruggen, 2020	-0.14	-0.63	0.35	6.89
contextual	Kelly et al., 2014	-0.12	-0.27	0.03	15.80
contextual	Marino et al., 2016	0.09	-0.02	0.20	16.79
contextual	Hammer et al., 2011	0.15	-0.10	0.40	12.64
contextual	Dunham et al., 1987b	0.49	0.09	0.88	8.83
contextual		-0.06	-0.23	0.10	
personal	Clayton et al., 2017	-0.68	-1.30	-0.05	4.64
personal	Wiley et al., 2007	-0.65	-1.07	-0.23	7.97
personal	Slutsky et al., 2019	-0.57	-1.11	-0.02	5.70
personal	Michel et al., 2014	-0.53	-0.79	-0.26	12.76
personal	Verweij et al., 2018	-0.50	-0.84	-0.16	10.16
personal	Haslam et al., 2013	-0.49	-0.92	-0.07	7.92
personal	Kiburz et al., 2017	-0.47	-0.87	-0.06	8.37
personal	Cardador et al., 2014	-0.34	-0.67	-0.01	10.42
personal	Liossis et al., 2009	-0.28	-0.79	0.23	6.19
personal	Nicklin et al., 2021	-0.25	-0.58	0.07	10.56
personal	Althammer et al., 2021	-0.15	-0.60	0.30	7.39
personal	Shen & Shockley, 2021	0.38	-0.04	0.81	7.93
personal		-0.37	-0.52	-0.22	
Overall		-0.23	-0.34	-0.11	



Note. Contextual: interventions aiming at increasing contextual resources. Personal: interventions aiming at increasing personal resources. Overall effect sizes are symbolized as a diamond.

Figure 5

Effectiveness in Decreasing Work-to-Nonwork Conflict for Interventions in the Boundary-Spanning vs. Nonwork vs. Work Domain



Note. Boundary-spanning: interventions targeting the boundary-spanning domain. Nonwork: interventions targeting the nonwork domain. Work: interventions targeting the work domain. Overall effect sizes are symbolized as a diamond.

Supplemental material for "The Effectiveness of Work-Nonwork Interventions: A Theoretical Synthesis and Meta-Analysis"
Overview of Work-Nonwork Intervention Studies Included in Meta-Analysis

Table S1
Overview of Work-Nonwork Intervention Studies Included in Meta-Analysis

Author (Year)	Resources vs. Demands	Personal vs. Contextual	Domain	Participants' characteristics	Methodological characteristics	Outcomes
Nicklin et al. (2021)	Resources	Personal	Boundary-spanning	*N* = 148 Age *m* = 40.8 Female = 68.5% Married = 87.0% Parents = 78.8% Work hours *m* = 43.3	Individualized online intervention Lag = 0 weeks	Work-to-nonwork conflict Nonwork-to-work conflict Work-nonwork balance
Althammer et al. (2021)	Resources	Personal	Work	*N* = 190 Age *m* = 42.2 Female = 75.3% Married = 76.8% Parents = 30.0%	Individualized online intervention Lag = 2 weeks	Work-to-nonwork conflict Work-nonwork balance
Delanoeije and Verbruggen (2020)	Resources	Contextual	Work	*N* = 78 Female = 24.4% Married = 74.4%	Change in working conditions without courses or workshops Lag = 12 weeks	Work-to-nonwork conflict

Heskiau and McCarthy (2020)	Resources	Personal	Boundary-spanning	*N* = 163 Age *m* = 43.2 Female = 81.6% Married = 66.0% Parents = 54.3% Work hours *m* = 39.2	Individualized online intervention Length = 0.66h Lag = 2 weeks	Work-to-nonwork enrichment
Slutsky et al. (2019)	Resources	Personal	Nonwork	*N* = 60 Age *m* = 30.5 Female = 66.7% Married = 46.7%	Individualized online intervention Length = 16.5h Lag = 0.5 weeks	Work-to-nonwork conflict Nonwork-to-work conflict
Verweij et al. (2017)	Resources	Personal	Nonwork	N = 148 Age *m* = 31.2 Female = 88.0% Married = 72.0% Parents = 25.0% Work hours *m* = 46.9	Face-to-face group interventions, Length = 26h Lag = 90 weeks	Work-to-nonwork conflict Nonwork-to-work conflict
Kiburz et al. (2017)	Resources	Personal	Nonwork	*N* = 102 Age *m* = 45.0 Female = 79.4% Married = 94.1% Parents = 55.9% Work hours *m* = 38.8	Face-to-face group interventions Length = 1h Lag = 14 weeks	Work-to-nonwork conflict Nonwork-to-work conflict

Clayton et al. (2017)	Resources	Personal	Nonwork	*N* = 46 Age *m* = 39.0 Female = 100% Married = 54.3% Parents = 30.0% (living at home)	Face-to-face group interventions Length = 5.25h Lag = 4 weeks	Work-to-nonwork conflict Nonwork-to-work conflict
Marino et al. (2016)	Resources	Contextual	Boundary-spanning	*N* = 1522 Age *m* = 38.5 Female = 91.8% Married = 62.9% Work hours *m* = 39.9	Face-to-face group interventions Lag = 26 weeks	Work-to-nonwork conflict
Dyrbye et al. (2016)	Resources	Personal	Work	*N* = 290 Female = 32.4% Married = 88.6% Work hours *m* = 59.6	Individualized online intervention Length = 0.83h Lag = 12 weeks	Work-nonwork balance
Michel et al. (2014)	Resources	Personal	Work	*N* = 246 Age *m* = 41.4 Female = 71.1% Married = 80.1% Parents = 32.5% (living at home)	Individualized online intervention Length = 2.25h Lag = 0 weeks	Work-to-nonwork conflict Work-nonwork balance
Cardador (2014)	Resources	Personal	Work	*N* = 217 Age *m* = 36.5 Female = 65.0%	Individualized online intervention Length = 0.66h Lag = 1 week	Work-to-nonwork conflict

Kelly et al. (2014)	Resources	Contextual	Boundary-spanning	*N* = 694 Work hours *m* = 45.0	Face-to-face group interventions Length = 8h Lag = 26 weeks	Work-to-nonwork conflict Nonwork-to-work conflict
Albertsen et al. (2014)	Resources	Contextual	Work	*N* = 606 Female = 92.4%	Change in working conditions without courses or workshops Lag = 52 weeks	Work-to-nonwork conflict Work-to-nonwork enrichment
(Shen & Shockley, 2014)	Resources	Personal	Boundary-spanning	*N* = 124 Age m = 34.3 Female = 74.2% Married = 100% Parents = 44.3% Work hours m = 42.8	Individualized online intervention Lag = 0 weeks	Work-to-nonwork conflict Nonwork-to-work conflict Work-to-nonwork enrichment Nonwork-to-work enrichment
Haslam et al. (2013)	Resources	Personal	Nonwork	*N* = 107 Age m = 40.6 Female = 76.7% Married = 90.0% Parents = 100%	Face-to-face group interventions Length = 16h Lag = 3 weeks	Work-to-nonwork conflict Nonwork-to-work conflict
Nabe-Nielsen et al. (2011)	Resources	Contextual	Work	*N* = 222 Age *m* = 44.6 Work hours *m* = 31.1	Change in working conditions without courses or workshops Lag = 52 weeks	Work-to-nonwork conflict

Kelly et al. (2011)	Resources	Contextual	Work	*N* = 608 Age *m* = 32.0 Female = 50.0% Married = 69.0% Parents = 35.0% Work hours *m* = 48.2	Face-to-face group interventions Length = 6h Lag = 26 weeks	Work-to-nonwork conflict
Hammer et al. (2011)	Resources	Contextual	Boundary-spanning	*N* = 239 Age *m* = 40.0 Female = 22.6% Married = 57.0% Parents = 48.0%	Face-to-face group interventions Lag = 4 weeks	Work-to-nonwork conflict Nonwork-to-work conflict
Karlson et al. (2009)	Demands	Contextual	Work	*N* = 185 Age *m* = 45.0 Female = 16.7%	Face-to-face group interventions Length = 1h Lag = 64 weeks	Work-to-nonwork conflict Nonwork-to-work conflict
Liossis et al. (2009)	Resources	Personal	Work	*N* = 126 Age *m* = 39.3 Female = 77.8% Married = 75.3% Work hours *m* = 41.0	Face-to-face group interventions Length = 10.5h Lag = 0 weeks	Work-to-nonwork conflict Nonwork-to-work conflict Work-to-nonwork enrichment Nonwork-to-work enrichment Work-nonwork balance
Millear et al. (2008)	Resources	Personal	Work	*N* = 71 Age *m* = 36.6 Work hours m = 45.3	Face-to-face group interventions Length = 11h Lag = 0 weeks	Work-nonwork balance

Wiley et al. (2007)	Resources	Personal	Boundary-spanning	*N* = 101 Female = 100% Married = 79.2% Parents = 100%	Face-to-face group interventions Length = 2h Lag = 4 weeks	Work-to-nonwork conflict
Pryce et al. (2006)	Resources	Contextual	Work	*N* = 177 Age *m* = 43.0 Female = 92.0%	Face-to-face group interventions Lag = 20 weeks	Work-nonwork balance
Dunham et al. (1987a)	Demands	Contextual	Work	*N* = 108	Change in working conditions without courses or workshops Lag = 8 weeks	Work-to-nonwork conflict
Dunham et al. (1987b)	Resources	Contextual	Work	*N* = 102	Change in working conditions without courses or workshops Lag = 12 weeks	Work-to-nonwork conflict

Methodological and Sample Characteristics as Boundary Conditions

We tested for potential moderating effects in an exploratory manner (Table S2). We ran meta-regression to assess continuous moderators (i.e., mean age, percent female, percent parents, percent married, mean work hours, length of total intervention, and the time lag between intervention end and post-measure). We conducted subgroup analyses for categorical variables (i.e., intervention method). We did not find any moderating effects of methodological and sample characteristics.

Table S2

Results for Moderation Analysis

Moderator	**k**	***Coefficient***	***SE***	***Q***	***p***
Work-to-nonwork conflict					
Mean age	16	-0.01	0.02	0.24	0.62
Percent female	18	-0.19	0.31	0.38	0.54
Percent married	15	0.04	0.60	0.00	0.94
Percent parents	11	-0.24	0.37	0.42	0.51
Mean work hours	9	0.00	0.02	0.06	0.80
Intervention length	14	-0.01	0.01	0.37	0.54
Time lag	22	0.00	0.00	0.66	0.42
Intervention method	22			0.19	0.91
Change in working conditions	5	-0.21	0.19		
Face-to-face group	11	-0.29	0.09		
Individualized online	6	-0.25	0.13		
Nonwork-to-work conflict					
Mean age	10	-0.01	0.02	0.29	0.59
Percent female	10	-0.42	0.25	2.77	0.10
Percent married	9	0.00	0.54	0.00	1.00
Percent parents	7	-0.34	0.33	1.07	0.30
Mean work hours	6	0.05	0.03	2.40	0.12
Intervention length	10	0.00	0.01	0.04	0.84
Time lag	11	0.00	0.00	2.26	0.11
Intervention method	11			0.09	0.76
Face-to-face group	8	-0.21	0.08		
Individualized online	3	-0.16	0.12		
Work-to-nonwork enrichment					
Mean age	3				
Percent female	4	0.34	1.04	0.10	0.75
Percent married	3				
Percent parents	2				
Mean work hours	3				
Intervention length	3				
Time lag	4	0.00	0.00	0.05	0.82
Intervention method	4				
Change in working conditions	1				
Face-to-face group	1				

Individualized online	2				
Work-nonwork balance					
Mean age	6	0.00	0.04	0.01	0.92
Percent female	6	0.54	0.29	3.34	0.07
Percent married	5	-2.10	1.44	2.12	0.15
Percent parents	3				
Mean work hours	4	-0.02	0.01	2.29	0.13
Intervention length	5	0.02	0.02	1.02	0.31
Time lag	7	-0.01	0.01	0.52	0.47
Intervention method	7			0.95	0.33
Face-to-face group	3	0.35	0.12		
Individualized online	4	0.22	0.08		

Note. Continuous moderators were assessed with meta-regression, and categorical variables with subgroup analyses. If only *k* is indicated, the number of available studies was too low to test for moderators.

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