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The Differential Role of Job Demands in Relation to Nonwork Domain Outcomes Based on The Challenge-Hindrancel Framework

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Abstract

The purpose of this study was to meta-analytically test a novel theoretical model examining a dual stressor and dual process model relating demands in the work domain to outcomes in the nonwork domain. The foundation for this model rested upon the challenge-hindrancel framework and the role depletion and role enhancement

perspectives derived from role theory as applied to the work-nonwork interface. The results show mixed support for the proposed model. In line with the challenge-hindrance framework the effects of challenge stressors were less detrimental than hindrance stressors. However, contrary to what has been reported for work domain outcomes, the net effect of both challenges and hindrances on nonwork domain outcomes was negative. Theoretical and practical implications of these findings are discussed.

Keywords

Challenge stressors; hindrance stressors; work-family conflict; work-family enrichment

Over the past several decades the intersection of work and nonwork has garnered considerable research attention. Much of that research has focused on the conflict that can occur between work and nonwork domains. Research in this area has produced a large and robust literature examining the antecedents and outcomes of work-nonwork conflict (WNC) that has advanced our understanding of the impact that combined participation in work and nonwork roles can have on employees (e.g. Byron, [10]; Eby, Casper, Lockwood, Bordeaux, & Brinley, [24]; Michel, Kotrba, Mitchelson, Clark, & Baltes, [63]). A major conclusion drawn from this research is that when employees encounter job demands in the work domain (e.g. workload and cognitive demands) they are more likely to experience WNC (Michel, Mitchelson, Kotrba, LeBreton, & Baltes, [64]). One seemingly counterintuitive development in this literature is the recognition that beyond the unfavourable consequences that employees experience as a result of occupying work and nonwork roles, favourable outcomes can occur as well (Carlson, Kacmar, Wayne, & Grzywacz, [12]). The positive synergy that occurs between work and nonwork has been referred to as work-family enrichment (Greenhaus & Powell, [35]; Wayne, Grzywacz, Carlson, & Kacmar, [96]) or more broadly as work-nonwork enrichment (WNE). Although research on this phenomenon is somewhat mixed, studies have found that job demands encountered in the work domain have the potential to enrich experiences in the nonwork domain (see Crain & Hammer, [17] for a review). This sets up an interesting paradox whereby some of the same job demands seem to be able to produce both WNC and WNE.

A number of theoretical models and empirical works have sought to explain the processes and mechanisms linking job demands and other working conditions to nonwork domain outcomes via work-nonwork conflict and work-nonwork enrichment. Generally, they propose that working conditions lead to negative outcomes in the nonwork domain via WNC when they produce a loss of personal resources such as, affect, skills and capital (Chen, Powell, & Cui, [16]; Edwards & Rothbard, [25]; Grandey & Cropanzano, [33]; Voydanoff, [94]) and positive outcomes in the nonwork domain via WNE when they produce a gain of personal resources (Greenhaus & Powell, [35]; Grzywacz & Butler, [36]; Wayne et al., [96]). A key assumption of these models is that job demands such as experiencing heavy workloads and high levels of responsibility lead to resource loss while other working conditions such as social support, autonomy, and developmental opportunities lead to resource gains (ten Brummelhuis & Bakker, [90]; Wayne et al., [96]).

Still, because it is often assumed that job demands only lead to resource loss (Kossek, Pichler, Bodner, & Hammer, [49]; Lapierre et al., [50]), research has yet to consider the processes and mechanisms that link job demands, *both positively and negatively*, to nonwork domain outcomes via both WNC and WNE. This oversight is an important omission given that research in the broader occupational stress literature (i.e. the challenge-hindrance framework; Cavanaugh, Boswell, Roehling, & Boudreau, [14]) has shown that certain job demands, while producing resource loss, also have the potential to produce resource gain. Further, not accounting for the possibility that job demands may produce co-occurring resource losses and gains leaves unanswered questions regarding the net effect of these two independent and seemingly opposing mechanisms linking job demands to outcomes in the nonwork domain.

To address these issues we propose the challenge-hindrance framework of occupational stress (Cavanaugh et al., [14]) as a useful model to help explain the linkages between job demands, WNC, WNE,[1] and nonwork domain outcomes. The challenge-hindrance framework makes an important distinction between job demands that are typically thought to be challenges and those that are typically thought to be hindrances. *Challenge stressors* are those job demands that are thought to have the potential to lead to personal growth, development, and attainment of goals. Examples of challenge stressors include workload, time pressure and responsibility. *Hindrance stressors* are those job demands that are thought to have the potential to thwart personal growth, development, and the attainment of goals. Examples of hindrance stressors include situational constraints, role ambiguity, and organisational politics. This framework proposes that while both challenge and hindrance stressors produce strain, challenge stressors tend to positively relate, and hindrance stressors negatively relate, to favourable outcomes. The distinction between challenge and hindrance stressors has received considerable support in terms of explaining previously inconsistent relationships between job stressors and work-related outcomes (Crawford, LePine, & Rich, [19]; González-Morales & Neves, [31]; Tadić Vujčić, Bakker, & Oerlemans, [87]; Webster, Beehr, & Christiansen, [97]).

The major aim of this study is to better understand how and why job demands lead to WNC and WNE, and how they jointly relate to satisfaction in the nonwork domain. To accomplish this we use meta-analytic structural equations modelling to examine a model that integrates propositions drawn from the challenge-hindrance framework (Cavanaugh et al., [14]) to inform our understanding of the work-nonwork interface. By adopting this approach we contribute to the literature regarding the relationship between work and nonwork in several ways. First, we test the challenge-hindrance framework as a novel perspective for explaining the effects of job demands (i.e. stressors) on WNC and WNE and subsequent nonwork domain outcomes. Although prior meta-analyses have examined stressful job demands as antecedents to WNC, WNE or other nonwork domain outcomes (Byron, [10]; Ford, Heinen, & Langkamer, [27]; Michel & Hargis, [62]; Zhang, Xu, Jin, & Ford, [102]), none of them distinguished between the different types of stressful job demands as would be posited by the challenge-hindrance framework and none of them included both WNC and WNE. Unlike these, we argue that distinguishing between challenge and hindrance stressors can help explain the paradox whereby stressful job demands both conflict with and/or enrich the nonwork domain.

In addition, we identify possible mediating mechanisms derived from the challenge-hindrance framework and models of WNC and WNE linking job stressors to the nonwork domain. Noting a common resource "gain" and "loss" process underlies challenges, hindrances, WNC, WNE we provide insight into mechanisms linking job stressors to WNC, WNE, and outcomes in the nonwork domain. We also examine the net effect of the co-occurring resource gain/loss mechanisms that link job stressors to outcomes in the nonwork domain. In doing so, we shed light on how these competing processes that ultimately relate to the nonwork domain. Finally, we examine the efficacy of the challenge-hindrance framework to predict outcomes in the nonwork domain. This represents an important extension of the challenge-hindrance framework because until now it has been applied almost exclusively to outcomes in the work domain leaving its generalizability to nonwork domain outcomes uncertain.

Theoretical development

The challenge-hindrance framework

The challenge-hindrance framework (Cavanaugh et al., [14]) is based on the transactional theory of stress (Lazarus & Folkman, [52]). A key premise of this theory is that stress does not result solely from situations arising in the environment (e.g. job demands) or characteristics of the person; rather, stress stems from an appraisal process wherein people judge situations in the environment as taxing or exceeding their resources and posing a danger to their wellbeing. Lazarus and Folkman ([52]) postulated that people appraise stressful situations as

threats when there is potential for harm or loss, or as challenges when there is the potential for growth, mastery or gains. Building on this theory and focusing on work-related stressors, Cavanaugh et al. ([14]) hypothesised and found empirical evidence for this two-way categorisation of stressful job demands. They referred to job demands that are *typically* appraised as having the potential for harm/loss as hindrance stressors, and similar to Lazarus and Folkman ([52]), they referred to job demands that are *typically* appraised as having the potential for growth, mastery or gains as challenge stressors.

As elaborated by LePine, and colleagues (e.g. Cavanaugh et al., [14]; LePine, LePine, & Jackson, [53]; LePine, Podsakoff, & LePine, [55]), one premise of the challenge-hindrance framework is that both challenge and hindrance stressors require coping processes that consume resources and lead to psychological strains. Psychological strains are the negative reactions such as exhaustion, anxiety and depression that employees experience when confronted with stressors in their work environment (Jex, [43]). Because of this both challenge and hindrance stressors are associated with resource depletion. A second premise of the challenge-hindrance framework (which is unique from other models of occupational stress) is that *challenge and hindrance stressors relate differentially to outcomes other than strains* (Cavanaugh et al., [14]). Because challenge stressors are viewed as opportunities for growth, development, and goal attainment, they have the potential to produce resource gains because they "evoke positive affect and attitudes" (LePine, LePine, & Saul, [54], p. 50); conversely because hindrance stressors have the potential to undermine personal growth, development, and goal attainment they are associated resource loss in the form of decreased satisfaction. Initial evidence for these differential effects was provided in a series of meta-analyses showing that challenge stressors are positively related and hindrances are negatively related to work motivation (LePine et al., [55]), job satisfaction (Podsakoff, LePine, & LePine, [72]), and work engagement (Crawford et al., [19]). Subsequent research has found this pattern of differential results for work outcomes (Peng, Zhang, Xu, Matthews, & Jex, [71]) and employee wellbeing (French, Allen, & Henderson, [28]; Olafsen & Frølund, [70]; Tadić Vujčić, Oerlemans, & Bakker, [88]).

Although the challenge-hindrance framework has been used to explain the relationship between stressors and outcomes in the work domain, it also holds considerable promise for explaining the relationships between stressors arising from the work domain and outcomes in the nonwork domain. One reason for this is because the processes of resource gains and losses experienced when exposed to challenge and hindrance stressors also underlie the experiences of WNC and WNE that are part of the work-nonwork interface.

The work-nonwork interface

The work-nonwork interface can be described as the intersection of work and nonwork roles and the cross-domain pathways or channels that connect them to one another. Each role presents its own set of demands and opportunities to gain or lose constructive (e.g. time, pay, and new skills), physiological and psychological (e.g. mastery, esteem, and affect) resources (Carlson et al., [12]; Edwards & Rothbard, [25]; ten Brummelhuis & Bakker, [90]). Based on role theory (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, [45]), the way in which these two roles relate to each other has been characterised by the dual processes of *role depletion* and *role enhancement* (Edwards & Rothbard, [25]; Frone, [29]; Greenhaus & Beutell, [34]; LePine et al., [54]; Rothbard, [78]). Derived from what is sometimes referred to as "scarcity" (Goode, [32]), the role depletion process suggests that workers have a limited amount of psychological and physiological resources, and the consumption of those resources in the course of meeting expectations in one role (e.g. work) lowers the level of resources the worker has available to meet demands in the other role (e.g. nonwork; Grzywacz & Marks, [37]; Rothbard, [78]). Role enhancement, on the other hand, is a process derived from the idea of role accumulation (Sieber, [82]). From this perspective, holding multiple roles provides multiple opportunities to acquire or generate physiological and psychological resources. That is, rather than there being a fixed pool of resources to be consumed, participation in multiple high-quality roles expands the pool of resources that are available across roles (Greenhaus & Powell, [35]; Grzywacz & Marks, [37]; Rothbard, [78]).

Work-nonwork conflict and enrichment

These two processes by which resources are depleted and enhanced provide the theoretical groundwork for two conceptually and empirically distinct constructs. The role depletion process explains the potentially detrimental effect of work on nonwork and provides the basis for WNC (Chen & Powell, [15]; Chen et al., [16]). That is, as the fixed amount of resources become divided across roles (scarce) it becomes difficult to meet the competing demands in both roles and inter-role conflict between work and nonwork results (Bellavia & Frone, [7]; Greenhaus & Buetell, [34]). On the other hand, the role enhancement process explains the potentially beneficial effect of work on nonwork (Carlson et al., [12]; Greenhaus & Powell, [35]). That is, participation in the work role generates resources that can improve the quality of life in the nonwork role (Greenhaus & Powell, [35]; Lapierre et al., [50]; Wayne et al., [96]). A number of concepts have been introduced to describe this beneficial effect such as positive spillover (Edwards & Rothbard, [25]; Grzywacz & Marks, [37]; Hanson, Hammer, & Colton, [39]) and work-family facilitation (Carlson et al., [12]; Voydanoff, [94]; Wayne et al., [96]). Although there are subtle differences between them, we adopt the term work nonwork *enrichment* when referring to the overall positive impact that work can have on nonwork (Crain & Hammer, [17]; Lapierre et al., [50]).

In light of these theoretical arguments that resource depletion and enhancement underlie WNC and WNE, theory and research has sought to identify and categorise the resources that potentially link work and nonwork roles to conflict (Edwards & Rothbard, [25]) or enrichment (Greenhaus & Powell, [35]). Combining these perspectives and summarising the empirical research regarding them (e.g. Carlson et al., [12]; Grzywacz & Marks, [37]; Hanson et al., [39]), there is a growing consensus that personal resources include "constructive" or material resources such as pay and new skills, and physiological/psychological resources or affect such as satisfaction (Lapierre et al., [50]; ten Brummelhuis & Bakker, [90]). A number of empirical studies have generally supported the resources identified by these theories (e.g. Carlson et al., [12]; Grzywacz & Marks, [37]; Hanson et al., [39]). Both cross-sectional (Chen & Powell, [15]) and longitudinal studies (Chen et al., [16]) support the notion that resource losses relate to both WNC and resource gains relate to WNE.

Affective pathway

Research examining the work-nonwork interface has identified this broader set of potentially role enhancing and depleting resources that may link work and nonwork via WNC and WNE. However, the conceptual foundation for the present study combines this role depletion and role enhancement perspectives (Edwards & Rothbard, [25]; Greenhaus & Beutell, [34]; LePine et al., [54]; Rothbard, [78]) with propositions of the challenge-hindrance stressor framework (Cavanaugh et al., [14]), which is based on the transactional theory of stress (Lazarus & Folkman, [52]). As a result, we focus on the resource, positive work affect, because it reflects key premises of the challenge-hindrance framework and the psychological processes of the transactional theory of stress that underlies it. Although challenge, hindrance, and threat appraisals have subsequently been shown to be conceptually and empirically distinct from the demands that are thought to evoke them (González-Morales & Neves, [31]; Searle & Auton, [79]; Tuckey, Searle, Boyd, Winefield, & Winefield, [91]; Webster, Beehr, & Love, [98]), Cavanaugh et al. ([14]) argue that these appraisals typically occur in response to challenge and hindrance demands. Regarding these appraisals that are theorised to typically occur, Lazarus and Folkman ([52]) call specific attention to the pleasurable psychological states associated with challenge appraisals and the negative psychological states associated with hindrance appraisals. Given the central role of psychological states such as positive affect in this theorising, we focus on the gains/losses of it rather than the material resources that would be generally less well explained by this theory.

The focus on positive work affect as a resource pathway linking work and nonwork is also consistent with the role depletion and role enhancement perspectives and has received empirical support in studies examining the challenge-hindrance framework outside of the work-nonwork literature (e.g. Podsakoff et al., [72]). Positive affect reflects the positive moods and satisfaction as theorised by Edwards and Rothbard ([25]), and it reliably

emerged as a resource distinct from the others in empirical studies (e.g. Carlson et al., [12]). Chief among constructs representing positive work affect is job satisfaction. Although, as an attitude, job satisfaction has a cognitive component, this evaluation results in an affective reaction. This can be seen in long standing definitions of job satisfaction such as that by Locke ([59]) who defined job satisfaction as a "positive emotional state resulting from the appraisal of one's job or job experiences" (p. 1304), and widely used measures that define it "as the feelings a worker has about his job" (Smith, Kendall, & Hulin, [83], p. 100). Items referring to satisfaction with one's job are also included in measures that assess worker's affective reactions to their jobs (i.e. Van Katwyk, Fox, Spector, & Kelloway, [92]).

Strain pathway

We also include strain as a pathway linking work and nonwork roles via WNC and WNE. As noted earlier, psychological strains include exhaustion, anxiety and depression that employees experience when confronted with stressors (Jex, [43]). Including strain is again informed by both the challenge-hindrance stressor framework (Cavanaugh et al., [14]), and the role depletion and role enhancement perspectives drawn from role theory applied to the work-family interface (Edwards & Rothbard, [25]; Greenhaus & Beutell, [34]; LePine et al., [54]; Rothbard, [78]). From the challenge-hindrance perspective, strains result from both challenge and hindrance stressors. They also play an important linking role in the relationship between challenges and hindrances and behavioural outcomes in the work domain such as turnover (Podsakoff et al., [72]), job performance (LePine et al., [55]; Li, Chen, & Lai, [57]) and organisational citizenship behaviour (Rodell & Judge, [76]).

From the role depletion and enhancement perspectives, strains are considered resource depleting because they "reflect a reduction of physical energy and mental capacity" of a worker (LePine et al., [54], p. 49). The idea that challenge and hindrance stressors produce strain has been supported in studies examining the relationship of challenge and hindrance stressors in the work domain to strains such as anxiety and depression (Podsakoff et al., [72]), emotional exhaustion (Webster et al., [98]; Yao, Jamal, & Demerouti, [101]), somatic complaints (Kim & Beehr, [48]) and health risk behaviours (French et al., [28]). Meta-analyses of both cross-sectional (Aamstad, Meier, Fasel, Elfering, & Semmer, [1]) and longitudinal studies (Nohe, Meier, Sonntag, & Michel, [69]) have found that these types of strains arising from the work-role are predictive of WNC. In addition, strain in the form of emotional exhaustion has been found to mediate the relationship between job demands and WNC (Hall, Dollard, Tuckey, Winefield, & Thompson, [38]).

In summary, challenge and hindrance stressors have been linked to outcomes via the resource gain and loss mechanisms associated with them (LePine et al., [54]). Hindrance stressors are associated with resources loss both in terms of increased strains and lower affective resources. However, challenge stressors are associated with resources loss in one respect (i.e. increased strain) and resource gains in another respect (i.e. increased affective resources). Resource gains/losses along cross-domain affective and strain pathways have been theorised to underlie the experience of WNC and WNE, which, in turn, relate to important outcomes in the nonwork domain (ten Brummelhuis & Bakker, [90]).

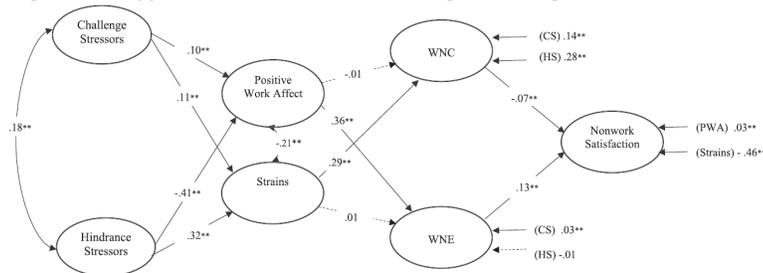
Hypothesised model

The conceptual foundation for our model rests on the integration of propositions from the challenge-hindrance framework (Cavanaugh et al., [14]) and the role depletion and role enhancement perspectives derived from role theory as applied to the work-nonwork interface (e.g. Chen & Powell, [15]; Chen et al., [16]). Many studies have examined the relationship between stressful job demands and outcomes. Most commonly by assuming that job demands only lead to negative outcomes in the nonwork domain (Kossek et al., [49]; Lapiere et al., [50]). An important point of departure in the present study is our use of the challenge-hindrance framework. That framework contends that job stressors differentially relate to outcomes. Research has supported this contention for work-related outcomes (Podsakoff et al., [72]; Rodell & Judge, [76]) but has not determined if these

differential effects extend to nonwork outcomes. By combining theory from the literature on the relationships between work and nonwork (role enhancement and depletion) we propose and test whether theorising from the challenge-hindrane framework also generalises to the work-nonwork interface. We examine the indirect relationships between challenge and hindrance stressors and the nonwork satisfaction via the gains and losses associated with the positive work affect and strain pathways that link work and nonwork as would be predicted by the role depletion and enhancement perspective.

As can be seen in Figure 1, which shows the hypothesised model (and its results), we begin by proposing that challenge and hindrance stressors are related directly to WNC and WNE. Consistent with much past research in the area of WNC (e.g. Byron, [10]; Eby et al., [24]; Michel et al., [63]) we would expect that, as stressors, both challenges and hindrances are positively related to WNC. However, unlike this previous research and informed by the challenge-hindrane framework, we contend that not all stressors relate to WNC in the same manner. More specifically, based on research applying the challenge-hindrane framework in the work domain (Crawford et al., [19]; Dawson, O'Brien, & Beehr, [21]; LePine et al., [55]) we argue that challenge stressors are relatively less detrimental than hindrance stressors. Thus, we would expect that challenge stressors would have a weaker positive relationship to WNC than hindrances.

Figure 1. Hypothesised model relating challenge and hindrance stressors to the nonwork domain.



Note: Results of final structural model. Harmonic mean = 13,365. Standardised parameter estimates for the structural model. (CS) represents direct effect of challenge stressors; (HS) represents direct effect of hindrance stressors; (PWA) represents direct effect of positive work affect; WNC=work to nonwork conflict; WNE=work to nonwork enrichment. * $p < .05$, ** $p < .01$.

With regard to WNE, past research is somewhat more mixed with some studies finding negative relationships between stressors and WNE (Voydanoff, [94]) and others having found positive relationships between stressors and WNE (Kacmar, Crawford, Carlson, Ferguson, & Whitten, [44]). According to the challenge-hindrane framework these mixed results may reflect the fact that hindrance stressors have detrimental effects whereas challenge stressors may have positive effects on favourable outcomes. This pattern of results has been found for a number of outcomes in the work domain such as engagement (Crawford et al., [19]) and job performance (LePine et al., [55]) and for general wellbeing (Tadić Vujčić et al., [87]; Widmer, Semmer, Kälin, Jacobshagen, & Meier, [99]). Extending this logic to the work-nonwork interface, we expect that challenges stressors will have a positive relationship with WNE and hindrance stressors will have a negative relationship with WNE.

Hypothesis 1: Challenge stressors will have a weaker positive relationship to WNC than hindrance stressors.

Hypothesis 2: Challenge stressors will be positively related to WNE (H2a) whereas hindrance stressors will be negatively related to WNE (H2b).

The remaining relationships shown in Figure 1 focus on linking challenge and hindrance stressors to nonwork satisfaction via the affect and strain pathways, WNC and WNE. It should be noted that the set of paths shown in

Figure 1 implies that the relationships from challenge and hindrance stressors to nonwork domain satisfaction are indirect (via gains and losses associated with positive work affect, strains, WNC and WNE) and these indirect relationships are reflected in our hypotheses.

Positive work affect

According to the challenge-hindrance framework one route by which we would expect challenge stressors to relate positively and hindrance stressors to relate negatively to nonwork domain satisfaction via depletion and enhancement is along the affective pathway linking stressors to WNC and WNE. The affective pathway involves the emotions, moods and attitudes stemming from demands in the work domain that we collectively refer to as positive work affect. It has long been argued that affect, for example in the form of satisfaction can spillover from the work role to the family role and that as such it is an important linking mechanism between work and nonwork (Greenhaus & Powell, [35]; LePine et al., [54]). Given that challenge stressors have the potential for growth and the attainment of goals, they have been shown to produce positive affect at work in the form of eagerness, excitement, and motivation (Crawford et al., [19]; Olafsen & Frølund, [70]), positive emotions (Rodell & Judge, [76]), and job satisfaction (Podsakoff et al., [72]). Further, research shows that these positive affective states arising from job demands are related to life satisfaction (Widmer et al., [99]).

Viewed from the role enhancement perspective (Grzywacz & Marks, [37]; LePine et al., [54]; Rothbard, [78]), we posit that challenge stressors are associated with a gain of affective resources that are produced in the work domain. These affective resources can then be deployed to meet demands in the nonwork domain thereby reducing the experiences of WNC and increasing the experiences of WNE. Taken together, theory underlying the challenge-hindrance framework (Cavanaugh et al., [14]) and role enhancement perspective would suggest a positive indirect serial process relates challenge stressors to nonwork satisfaction. That is, challenge stressors increase affective resources generated in the work role. As a resource, this positive work affect can be made available to help decrease WNC and increase WNE. Lower WNC and higher WNE can, in turn, result in higher nonwork satisfaction. In contrast to this, theory indicates that relationship between hinderance stressors and nonwork satisfaction is a negative indirect serial process better explained by the role depletion perspective (Bellavia & Frone, [7]; Frone, [29]; Greenhaus & Beutell, [34]). Hinderance stressors undermine growth and goal attainment, and in doing so they do not produce gains of affective resources, but instead result in a lower level of positive work affect. Having less positive work affective as a resource to deploy outside of work likely results in higher levels of WNC and lower levels of WNE, which ultimately leads to lower nonwork satisfaction.

The idea that challenge stressors relate positively, and hindrance stressors relate negatively, to nonwork outcomes via positive work affect was proposed by LePine et al. ([54]), but not empirically tested. Some empirical evidence for this proposition however, comes from studies that have shown that positive work affect is related to both WNC (Britt & Dawson, [8]; Frone, Yardley, & Markel, [30]) and WNE (Daniel & Sonnentag, [20]), and that WNC and WNE have been shown to relate to outcomes in the nonwork domain (Ilies, Wilson, & Wagner, [42]; McNall, Nicklin, & Masuda, [61]). Based on these theoretical arguments and past research we hypothesise:

Hypothesis 3: Challenge stressors will have a positive indirect relationship with nonwork satisfaction through positive work affect and reported experiences of WNC and WNE.

Hypothesis 4: Hindrance stressors will have a negative indirect relationship with nonwork satisfaction through positive work affect and reported experiences of WNC and WNE.

Strain

As stressors arising from the work role, both challenges and hindrances lead to strains because employees must engage in coping processes when confronted with stressful work demands (Cavanaugh et al., [14]). These

processes consume resources through physiological (e.g. activation of the autonomic nervous system; Taylor, [89]) and psychological mechanisms (e.g. increased effort and self-regulation; Muraven, Tice, & Baumeister, [66]). A number of studies have found that the experience of both challenges and hindrances at work can lead to strains including burnout (Yao et al., [101]) and one of its key indicators emotional exhaustion (Dawson et al., [21]); anxiety, depression (Crane & Searle, [18]) and physical symptoms (Webster et al., [98]).

The role depletion perspective would argue that the resource loss occurring as a result of strain represents an important mechanism linking work and nonwork because strains reduce the level of resources available to be deployed in the nonwork domain (Grzywacz & Marks, [37]; Hanson et al., [39]). In support of this assertion, studies have shown that strains reliably predict WNC (Nohe et al., [69]) and that the loss of resources associated with strains relate to both WNC and WFE (Chen et al., [16]). In this way, challenge and hindrance stressors are likely to lead to both higher levels of WNC and lower levels of WNE, which ultimately impairs nonwork satisfaction.

Hypothesis 5: Challenge stressors will have a negative indirect relationship with nonwork satisfaction through strain and reported experiences of WNC and WNE.

Hypothesis 6: Hindrance stressors will have a negative indirect relationship with nonwork satisfaction through strain and reported experiences of WNC and WNE.

In addition to suggesting that challenge stressors and hindrance stressors are differentially related to outcomes such as job performance, the challenge-hindrance framework also suggests that even the same job demand (i.e. a challenge stressor) can have differing and seemingly competing effects on the same outcome (Crawford et al., [19]). That is, challenge stressors can have positive effects on outcomes through their relations with positive affect, while at the same time having negative effects on those same outcomes through their relationship with strain. In the context of the work-nonwork interface and explained in terms of role enhancement and depletion perspectives, challenge stressors are associated with enhanced resources (gains) in terms of positive affect, which relate to lower WNC and higher WNE, that in turn relate favourably to outcomes in the nonwork domain. For example, a worker may be given responsibility for a challenging assignment, the completion of which may lead to greater recognition. This challenge stressor can result in a higher level of job satisfaction that spills over to the nonwork domain thereby reducing WNC and increasing WNE and leading to favourable outcomes in the nonwork domain. Simultaneously however, that same challenge stressor can also deplete resources (loss) through the experience of strains, which relate to higher WNC/lower WNE. These, in turn, relate to unfavourable nonwork domain outcomes. For example, when the exhaustion associated with completing a challenging assignment makes it more difficult engage in nonwork activities resulting in higher WNC/lower WNE and lower life satisfaction.

With the co-occurrence of these two potentially countervailing effects resulting from the same challenge stressor it is unclear whether the enhancement and depletion processes result in either a net positive (gain) or negative (loss) relationship with nonwork domain outcomes. In the empirical literature on challenge and hindrance stressors some evidence suggests that in the workplace, challenges tend to have a stronger positive relationship with favourable outcomes such as engagement than negative outcomes such as strain (Crawford et al., [19]; Karatepe, Beirami, Bouzari, & Safavi, [46]). Further, when considering the relationship between challenge stressors and work domain outcomes such as job performance, some studies have found that the positive indirect relationship between challenge stressors via motivation was stronger than the negative indirect effect of challenge stressors via strain (LePine et al., [55]). Indeed, Podsakoff et al. ([72]) asserted that the positive affect resulting from challenge stressors is strong enough to offset the negative effects resulting from strain. In one of the few studies that examined an off-job behaviour, Calderwood and Ackerman ([11]) found

that workers who experienced challenge stressors during the day were less likely to drive in an unsafe manner during their after-work commute, presumably as a result of challenge stressors effects on strain and affect.

For hindrance stressors, their relationship to nonwork outcomes is more theoretically straight forward than for challenge stressors. According to theory, hindrance stressors are expected to result in unfavourable outcomes. For example, a worker may experience a hindrance stressor at work such as role conflict that prevents goal accomplishment resulting in lower job satisfaction and increased exhaustion (strain). From the perspective of role enhancement and depletion, both the reduced positive work affect and increased strain represent resource loss. These resources are then unavailable in the nonwork domain, resulting in higher WNC and lower WNE and ultimately, unfavourable outcomes. Studies of the challenge-hindrance framework consistently support the notion that hindrance stressors result in higher strains and lower work attitudes (e.g. Crane & Searle, [18]). Although studies examining hindrance stressors commonly include both strains and job affect, formal comparisons of the strength of relationship of hindrances to strains and the relationship of hindrances to work-related affect are rarely conducted. Still, based on theory we hypothesised the following:

Hypothesis 7: The positive indirect relationship between challenge stressors and nonwork satisfaction through positive work affect and WNE will be stronger than the negative indirect relationship between challenge stressors and nonwork satisfaction through strain and WNC.

Hypothesis 8: The negative indirect relationship between hindrance stressors and nonwork satisfaction through strain and WNC will be stronger than the negative indirect relationship between hindrance stressors and nonwork satisfaction through positive work affect and WNE.

Method

Literature search and inclusion criteria

We used a threefold strategy for identifying relevant articles for the study. In the first step, we conducted a search on the PsychINFO, Business Source Complete, Sociological Abstracts, and Google Scholar databases through March 2017 by coupling keywords for stressors and work-nonwork variables. Stressor keywords included stress, stressor, demands, distress, hassles, eustress, workload, responsibilities, role ambiguity, role conflict, overload, abusive supervision, interpersonal conflict, and politics. Work-nonwork keywords included work, nonwork, family, enrichment, facilitation, enhancement, spillover, conflict, and interference. Following the approach by LePine et al. ([55]) and Podsakoff et al. ([72]), we limited our search to 35 peer-reviewed journals to keep the search process manageable. The journals included those 22 journals used by previous meta-analyses on challenge and hindrance stressors (see LePine et al. and Podsakoff et al.). In the second step, we added 13 additional journals that reported empirical articles on stressor and work-nonwork relationships. These 13 journals were identified by examining the reference lists of recent reviews and meta-analyses that focused on work to family interference and enrichment (e.g. Crain & Hammer, [17]; Eby et al., [24]). A complete list of journals can be obtained from the corresponding author. Third, we sent a request for unpublished studies to three listservs including two from the Academy of Management (Organizational Behavior Division List and Human Resources Division List), and the Society for Occupational Health Psychology List. We did receive some unpublished studies, but only one met the criteria for inclusion in the meta-analysis.

To be included in the meta-analysis, the study had to meet five criteria. First, studies had to be empirical, and report a correlation coefficient or statistics that could be used to compute a correlation coefficient. Second, studies had to be written in English albeit the sample could be from any country. Third, studies had to include a measure of WNC, interference, or a similar construct depicting a negative interaction from work to nonwork and/or a measure of WNE, facilitation, enhancement, or a similar construct depicting a positive interaction from

work to nonwork. Fourth, studies had to specify the direction of work-nonwork conflict or work-nonwork enrichment as WNC or WNE. Studies that did not specify the direction, or used measures of nonwork conflicting with work, nonwork enriching work, or global measures of work-nonwork conflict or work-nonwork enrichment were not included. Last, studies had to include a relationship between a stressor and a measure of WNC and/or WNE. In total, the final database included 232 independent samples from 163 articles. A complete list of the studies is available from the corresponding author.

Coding of studies

The studies were independently coded by the authors (interrater agreement was 91% across all studies). After a discussion of the original article all discrepancies were reconciled. The information that was collected from each study included the relevant effect size information, the sample size, and reliability coefficients for the measures. When studies included multiple measures of a relevant construct we computed a composite correlation using Hunter and Schmidt's ([40], p. 459) formula to account for within-study correlations, as opposed to averaging the correlations. Table 1 provides a list of variables and how they were coded.

Table 1. Coding of study variables.

Stressors	Positive work affect	Strains	Work-nonwork interface	Nonwork satisfaction
Challenge Stressors Hours overtime Hours worked Job/work time demands Pressure to complete tasks Workload Work time commitments Work responsibility	Job satisfaction Positive emotional state Work positive affect (state) Work satisfaction	Anxiety Burnout Depersonalisation Depression Emotional exhaustion Fatigue Frustration Health complaints Illness Mental/physical	Work-Nonwork Conflict Conflict Interference Negative spillover Work-Nonwork Enrichment Enhancement Enrichment Facilitation	Family satisfaction Home satisfaction Marital satisfaction
Hindrance Stressors Work role stress (ambiguity, overload, conflict) Work constraints Work hassles Interpersonal conflict Supervisor-related stress Organisational politics Job insecurity		symptoms Tension	Positive spillover	

Stressors: With respect to the stressor variables, we coded stressor measures as either challenges or hindrances. This dual-stressor framework has been validated by previous qualitative and quantitative research (e.g. Cavanaugh et al., [14]; LePine et al., [55]; Podsakoff et al., [72]). Challenge stressors included measures of level of attention required by job/role, job responsibility, time pressure, time commitments, and quantitative and subjective workload. Hindrance stressors included measures of role ambiguity, role conflict, role overload, situational constraints, hassles, interpersonal conflict, abusive supervision, organisational politics, and job insecurity. Stressor measures that included both challenge and hindrance items were not included in the analysis.

Positive work affect: Measures of positive work affect included measures of positive state-based work affect, work satisfaction, overall job satisfaction, and composites of job satisfaction facets including supervision, pay, and promotion satisfaction. If a study measured satisfaction for more than one aspect of the work domain, we calculated the correlation between the composite of satisfaction measures using Hunter and Schmidt's ([40], p. 459) formal for composite correlations.

Strains: Measures of strains included anxiety, burnout, depression, depersonalisation, exhaustion, fatigue, frustration, health complaints, illness, mental and physical symptoms, and tension. When studies reported more than one strain, as many did, we calculated the composite correlation among the effect sizes using the same method that was used for positive work affect.

Work-Nonwork Conflict (WNC): Measures of WNC included work conflicting with nonwork/family, work interfering with nonwork/family, and negative work to nonwork/family spillover. When multiple facets of WNC (e.g. time, strain, and behaviour) were measured in a single study we calculated composite effect sizes prior to meta-analytic examination using Hunter and Schmidt's ([40]) formula.

Work-Nonwork Enrichment (WNE): Measures of WNE included work enriching nonwork/family, work facilitating nonwork/family, work enhancing nonwork/family, and positive work to nonwork/family spillover. Similar to WNC, when multiple facets of WNE (e.g. affect and capital) were measured in a single study (e.g. Masuda, McNall, Allen, & Nicklin, [60]) we calculated composite effect sizes prior to meta-analytic examination using Hunter and Schmidt's ([40]) formula.

Nonwork Satisfaction: Nonwork satisfaction included measures of family-, marital- and home- satisfaction. When more than one dimension of nonwork satisfaction was measured, a composite was calculated in the same manner as the other variables in the model (i.e. Hunter & Schmidt, [40]).

Meta-analytic procedure

Prior to testing the hypotheses, we conducted a meta-analysis following the procedures developed by Hunter and Schmidt ([40]). First, for each primary study we corrected for sampling and measurement error for both the predictor and criterion. Next, we computed the sample-size weighted average corrected correlation (ρ), and calculated the 95% confidence intervals (CI) around the corrected correlations. We report these as well as the number of studies (k), the cumulative sample size (N), the standard deviation of the corrected meta-analytic correlations (SD_{ρ}), credibility intervals (CV), and Q statistic. The meta-analytic procedures proposed by Hunter and Schmidt ([40]) were used to correct correlations for unreliability and to account for the effects of sampling error on the variance of the correlations.

In order to test for publication bias we calculated Rosenthal's ([77]) Fail-safe N index, which is one of the more widely used techniques (Sutton, Song, Gilbody, & Abrams, [86]). This approach involved computing a combined p -value for all studies included in each meta-analysis to determine how many additional studies with a zero effect would be necessary to create a nonsignificant p value. Results showed that for the relationships between challenge stressors and all downstream variables would require a considerably large number of missing

samples that average no effect to erase the significance of their relationship at the 5% confidence interval [(523) positive work affect; (7304) strain; (288,192) WNC; (310) WNE; (208) nonwork satisfaction]. Each of the figures is considerably larger than the samples that were uncovered by the search. Similarly, for hindrance stressors, it would require a substantially larger number of samples that average no effect than found in the search to erase the significance at the 5% level of confidence: [(3325) positive work affect; (11,453) strain; (146,821) WNC; (902) WNE; (275) nonwork satisfaction]. These results suggest that publication bias was not a major problem with this dataset.

Results

Table 2 provides the meta-analytic results of the analyses distinguishing between challenge and hindrance stressors. Although challenges and hindrances were shown to have positive relationships with strains ($\rho = .17, p < .01$; $\rho = .34, p < .05$, respectively) and WNC ($\rho = .24, p < .05$; $\rho = .41, p < .05$, respectively), they have opposing relationships with positive work affect and WNE. That is, challenge stressors were positively related to positive work affect ($\rho = .03, p < .05$) and WNE ($\rho = .04, p < .05$) and hindrances were negatively related to positive work affect ($\rho = -.39, p < .05$) and WNE ($\rho = -.13, p < .05$), thus providing support for the challenge-hindrance stressor framework perspective. With regard to nonwork satisfaction, hindrance stressors had a negative relationship ($\rho = -.14, p < .05$), and contrary to our prediction, challenge stressors also had a negative relationship ($\rho = -.05, p < .05$) with nonwork satisfaction.

Table 2. Summary of meta-analytic relationships between specific stressor and employee criteria.

Criterion and stressor	<i>k</i>	<i>N</i>	<i>r</i>	ρ	SD_{ρ}	95%CI	80%CV	<i>Q</i>
Positive work affect								
Challenge stressor	48	71,880	.03	.03	.08	[.01,.06]	[-.07,.14]	428.13**
Hindrance stressor	19	5084	-.33	-.39	.17	[-.47, -.31]	[-.60, -.17]	150.10**
Strains								
Challenge stressor	51	21,107	.14	.17	.17	[.12,.22]	[-.05,.39]	556.46**
Hindrance stressor	31	18,261	.29	.34	.11	[.30,.38]	[.21,.48]	199.71**
Work to nonwork conflict								
Challenge stressor	168	142,848	.21	.24	.11	[.23,.26]	[.10,.39]	1642.63**
Hindrance stressor	87	49,015	.34	.41	.18	[.38,.45]	[.18,.64]	1432.87**
Work to nonwork enrichment								
Challenge stressor	36	26,994	.03	.04	.05	[.02,.06]	[-.03,.11]	95.79**
Hindrance stressor	19	11,939	-.10	-.13	.10	[-.18, -.09]	[-.26, -.01]	92.29**
Nonwork Satisfaction								
Challenge stressor	29	23,799	-.05	-.05	.09	[-.08, -.02]	[-.17,.07]	188.69**
Hindrance stressor	16	8951	-.12	-.14	.06	[-.17, -.10]	[-.22, -.06]	40.70**

Notes: *k* = the number of effect sizes; *N* = the total sample size; *r* = the sample weighted mean correlation; ρ = the estimated corrected correlation; SD_{ρ} = the standard deviation of the mean estimate of the corrected population correlation; *CI* = confidence interval; *CV* = credibility interval. ** $p < .01$.

Hypothesis testing

In order to test the simultaneous effects of challenges and hindrances on work and nonwork outcomes, and formally test our hypotheses we built a meta-analytic correlation matrix, as shown in Table 3, which consisted of the corrected correlation coefficients among the study variables. In order to have a complete matrix of coefficients for all relationships in the model, including those that were not the focus of the meta-analysis, we coded them from the primary studies and used this information to calculate corrected correlation coefficients (Podsakoff et al., [72]). Following Viswesvaran and Ones' ([93]) procedures for model testing, we imputed the

matrix and harmonic mean of the sample sizes for each cell into Mplus 7.11 software (Muthen & Muthen, [67]) to estimate the meta-analytic path coefficients. Because previous research has found negative relationships between positive affect-like constructs and strains (e.g. Faragher, Cass, & Cooper, [26]) we allowed the correlations between positive work affect and strains to be estimated in the model. The results for the model in Figure 1 showed that the model fit the data well ($\chi^2 (3) = 209.07$, CFI = .99, RMSEA = .07, SRMS = .02), and therefore was used for hypothesis testing. The standardised path coefficients for this model are shown in Figure 1.

Table 3. Meta-analytic correlations between the study variables.

Variable	1	2	3	4	5	6
1. Challenge stressors	–					
2. Hindrance stressors	.18	–				
k studies	39					
N total observations	18,799					
3. Positive work affect	.03	–.39	–			
k studies	48	19				
N total observations	71,880	5084				
4. Strains	.17	.34	–.33	–		
k studies	51	31	24			
N total observations	21,107	18,261	16,791			
5. Work to nonwork conflict	.24	.41	–.21	.41	–	
k studies	168	87	60	74		
N total observations	142,848	49,015	75,744	45,923		
6. Work to nonwork enrichment	.04	–.13	.36	–.11	–.12	–
k studies	36	19	16	14	35	
N total observations	26,994	11,939	8289	9794	25,652	
7. Nonwork satisfaction	–.05	–.14	.24	–.51	–.28	.20
k studies	29	16	16	9	38	7
N total observations	23,799	8951	7125	5236	21,587	5904

Note: Harmonic mean = 13,365.

Although, the paths from challenge and hindrance stressors to WNC were both positive and significant ($\beta = .14$, $p < .01$, $\beta = .28$, $p < .01$, respectively), they significantly differed in magnitude ($t(13,362) = 12.46$, $p < .01$). That is, the positive relationship between hindrance stressors and WNC is significantly stronger than the positive relationship between challenge stressors and WNC. Thus, supporting Hypothesis 1. With regard to Hypothesis 2, challenge stressors were positively related to WNE ($\beta = .03$, $p < .01$) as expected, but hindrances were not related to WNE ($\beta = -.01$, ns), thus Hypothesis 2 was only partially supported. To test the indirect effect hypotheses (Hypotheses 3 through 6) we used Preacher and Hayes ([73]) multiple mediator approach to simultaneously assess the multiple indirect effects. As shown in the top panel of Table 4, the collective indirect effect was significant for both challenge and hindrance stressors, suggesting that the four proposed intervening variables accounted for a significant amount of variability that in nonwork satisfaction. As shown in the middle panel of Table 4, challenge stressors had a nonsignificant indirect effect on nonwork satisfaction via positive work affect, WNC, and WNE ($\beta = .00$, ns), thus, no support was found for Hypothesis 3. Moreover, positive work affect partially mediated the effects of hindrance stressors on nonwork satisfaction through WNE, but not WNC. That is, positive work affect at least partially related hindrance stressors to nonwork satisfaction through the experience of WNE rather than WNC. Thus, the results provide partial support for Hypothesis 4.

Table 4. Effects of decomposition results for mediation test.

Stressor	Effects on WNC			Effects on WNE			Effects on nonwork satisfaction		
	Indirect	Direct	Total	Indirect	Direct	Total	Indirect	Direct	Total
Work resource channels and work-nonwork interface mediation (structure in Figure 1)									
Challenge stressors	.03**	.14**	.17**	.04**	.03**	.07**	-.05**		-.05**
Hindrance stressors	.10**	.28**	.38**	-.14**	-.01	-.14**	-.20**		-.20**
Challenge and hindrance stressors via positive work affect and work-nonwork interface									
Challenge stressors	-.00	.14**	.14**	.04**	.03**	.08**	.00		.00
Hindrance stressors	.00	.28**	.29**	-.15**	-.01	-.14**	-.06**		-.06**
Challenge and hindrance stressors via strains and work-nonwork interface									
Challenge stressors	.03**	.14**	.17**	.00	.03**	.03**	-.05**		-.05**
Hindrance stressors	.09**	.28**	.36**	.00	-.01	.01	-.17**		-.17**

** $p < .01$.

As shown in the bottom panel of Table 4, challenge stressors had a negative indirect relationship with nonwork satisfaction through strains and WNC ($\beta = -.05, p < .01$). In this case, strains only related to WNC, but not WNE, thus providing partial support for Hypothesis 5. As expected, hindrance stressors also had a negative indirect relationship with nonwork satisfaction through strains and WNC ($\beta = -.17, p < .01$). Like the effects of challenge stressors, strains partially mediated the association between hindrance stressors and nonwork satisfaction through WNC and not WNE, thus providing mixed support for Hypothesis 6. These findings indicate that strains partially mediated the relationships of challenge and hindrance stressors to nonwork satisfaction through the experience of WNC rather than WNE.

With respect to Hypothesis 7, we conducted a statistical comparison among the indirect effects of positive work affect and strains using the approach suggested by Preacher and Hayes ([73]). Contrary to our prediction the results showed a statistically significant difference (contrast = $-.02, p < .01$) indicating that the strain pathway played a stronger role than the positive work affect pathway in carrying the effects of challenge stressors on the experience of WNC and WNE, and ultimately nonwork satisfaction. Thus, Hypothesis 7 was not supported. Moreover, to compare the positive work affect and strain pathways for hindrance stressors we conducted a similar analysis as we did for Hypothesis 7. As predicted, the results showed a statistically significant difference between indirect effects (contrast = $.01, p < .01$) indicating that the strain pathway had a significantly stronger effect than the positive work affect pathway, thus supporting Hypothesis 8.

Discussion

Although work-family theories have proposed that experiences in the work domain can both interfere and enrich outcomes in the nonwork domain (Crain & Hammer, [17]; Eby et al., [24]), extant research has not determined whether, and if so, how job demands at work can have simultaneous, yet opposing effects on nonwork satisfaction. The purpose of this study was to fill this gap by proposing and meta-analytically testing a novel theoretical model examining dual processes by which demands in the work domain relate to outcomes in the nonwork domain. The foundation for this model rested upon the integration and extension of two theoretically distinct frameworks, the challenge-hindrance framework (Cavanaugh et al., [14]) and the role depletion and role enhancement perspectives derived from role theory as applied to the work-nonwork interface (Edwards & Rothbard, [25]; Frone, [29]; LePine et al., [54]; Rothbard, [78]). This integrated model proposed that challenge and hindrance stressors relate to the nonwork domain through gains and losses associated with positive work affect and strain that predict experiences of WNC and WNE and nonwork satisfaction. By integrating and extending these two theoretical frameworks our research has answered LePine et al.'s ([54]) call for more research focused on understanding the effects of job demands on nonwork outcomes and the mechanisms relating them to each other. Overall, the results provided mixed support for the hypothesised model. In line with the challenge-hindrance framework the effects of job demands on the work-family interface and nonwork outcomes differed based on whether the demand was a challenge stressor or hindrance stressor. However, contrary to what has been reported for work domain outcomes, the net effect of both challenges and hindrances on nonwork domain outcomes was negative.

Direct effects of challenge and hinderance stressors on WNC and WNE

With regard to the direct relationships that were hypothesised, we found that challenge and hindrance stressors were differentially related to WNC, WNE and nonwork satisfaction. As was predicted challenge stressors were less detrimental to each of these outcomes than were hindrances. Employees who encountered higher levels of hindrance stressors tended to perceive significantly higher levels of WNC than employees who encountered higher levels of challenge stressors. Challenge stressors had a positive relationship to WNE whereas hindrance stressors were not related to WNE. Much theorising and empirical research regarding the processes linking work and nonwork domains is rooted in the notion that stressful demands in the work domain are expected to similarly produce higher levels of WNC and lower levels of WNE (see Crain & Hammer, [17]; Eby et al., [24] for reviews). With few exceptions (i.e. Duong, Tuckey, Hayward, & Boyd, [23]) previous primary research and meta-analyses (e.g. Byron, [10]; Ford et al., [27]; Michel & Hargis, [62]) have treated all stressful job demands as equally harmful and not tested the possibility of differential effects across stressful job demands as were found here.

One of the key contributions of the current study is that these findings challenge this assumption that all job demands are "created equal" in term of their relationships to WNC and WNE. This has important implications for theories regarding the work-nonwork interface. Our findings suggest that theory regarding WNC based on inter-role conflict (e.g. Bellavia & Frone, [7]; Greenhaus & Beutell, [34]) could be further refined by incorporating the idea of differential relationships between job demands and WNC. Theory regarding WNE (Greenhaus & Powell, [35]; Wayne et al., [96]) could also be refined by more directly considering that specific types of job demands have the possibility to be not just role depleting but also role enhancing. This would stand in contrast to the preponderance of literature that has tended to focus on enhanced resources stemming from contextual factors (e.g. supportive people and policies at work) with job demands only considered resource depleting when predicting WNE (see Lapierre et al., [50]). The benefit of incorporating the differing effects found for job demands is likely greater theoretical specificity and more accurate predictions regarding both WNC and WNE. Precedent for these types of refinements based on the challenge-hindrance framework can be found for other

prominent theories of occupational stress (e.g. Job Demands Control Support model (Dawson et al., [21]) and the Job Demand Resource model (Bakker & Demerouti, [6])).

Indirect effects of challenge and hindrance stressors on nonwork satisfaction

Beyond the differential direct effects that were found for challenge and hindrance stressors, the present study also helps clarify the mechanisms that relate challenges and hindrances to outcomes in the nonwork domain. Past research has linked the simultaneously occurring negative (WNC) and positive (WNE) synergies between work and nonwork to nonwork domain outcomes (e.g. Shockley & Singla, [81]). Some research has also examined the "double-edged sword" that can occur between work and nonwork wherein a predictor such as boundary management relates to both WNC and WNE (Carlson, Kacmar, Zivnuska, & Ferguson, [13]). However, like the differential effects of job demands themselves, relatively little research has focused on the potentially competing resource gain and loss processes that relate job demands to the nonwork domain. Our research fills this gap by focusing on two theoretically meaningful sets of stressful job demands derived from the challenge-hindrance framework, and the resource depletion and enhancement processes that have been theorised relating them to WNC, WNE, and ultimately, nonwork satisfaction.

The results provide mixed support for these theoretical propositions. Challenge and hindrance stressors related to positive work affect and strain as would be predicted by theory. However, their indirect relationships with nonwork satisfaction via positive work affect and strain differed. Positive work affect partially mediated the effects of hindrance stressors on nonwork satisfaction through WNE, but not the relationship of challenge stressors to nonwork satisfaction through either WNC or WNE. On the other hand, strains partially mediated the effects of challenges and hindrances through WNC but not WNE. These findings show that both challenge and hindrance stressors deplete resources in terms of strains that relate to WNC, which ultimately relates to lower nonwork satisfaction. Hindrance stressors also have the additional detrimental relation to nonwork satisfaction via the depletion of positive work affect as a resource that relates to WNE. This indicates that, like the stressful demands themselves, different forms of role enhancement/depletion may not have equally strong relationships with nonwork domain outcomes. One reason for this may be the result of differences between positive work affect and strains. Some past research has found that positive states similar to positive work affect are more transient or short lived (Wood & Michaelides, [100]), whereas strains tend to be more chronic in that they develop and persist over a longer period of time (Widmer et al., [99]). These differential effects for enhancement and depletion processes should be considered in conjunction with one another in order to fully capture the process through which job stressors relate to the nonwork domain. Moreover, the results suggest that the role enhancement/depletion perspective could be refined by considering the relative strength of specific types of resources linking work and nonwork domains.

The results presented here also have implications for the challenge-hindrance framework of occupational stress by demonstrating if, and how, it extends to the nonwork domain. Nearly two decades ago, researchers offered the challenge-hindrance framework as a novel explanation for the differential relationships among certain job stressors and several work-related outcomes (Cavanaugh et al., [14]). Our research extends this framework by showing that, similar to the job domain, hindrance stressors are more strongly related than challenge stressors to outcomes such as WNC and WNE that sit at the intersection of work and nonwork. In addition, our results also provide some support for the notion that two of the same mechanisms that relate challenges and hindrances to outcomes in the work domain also relate them to outcomes in the nonwork domain.

An important point of departure of the results reported here regarding the work-family interface and the challenge-hindrance framework applied in work settings is regarding the net effect of challenge stressors. Contrary to the overall positive effect of challenge stressors that has been proposed and reported for work domain outcomes (LePine et al., [55]) in the present study we found that the net effect of challenge stressors on

nonwork satisfaction was negative. The effect of challenge stressors on nonwork satisfaction via strain and WNC was stronger than the positive effects of challenge stressors on nonwork satisfaction via positive work affect and WNE. Thus, the repeated findings that challenge stressors lead to a number of favourable outcomes in the work domain (Crawford et al., [19]; LePine et al., [55]) does not hold for outcomes in the nonwork domain. One plausible explanation for this can be found in research calling into question the a priori categorisation of stressors into challenges and hindrances. Derived from the transactional theory of stress (Lazarus & Folkman, [52]), one of the base assumptions of challenge-hindrance framework is that the challenge and hindrance stressors included in it are appraised as such by most people. This assumption has begun to be called into question by a growing body of research. For example, a number of studies have found that the stressors in the challenge-hindrance framework can be appraised as both challenges and hindrances and that challenge appraisals do not always mediate the relationship between challenge stressors and outcomes (LePine, Zhang, Crawford, & Rich, [56]; Searle & Auton, [79]; Webster et al., [98]). We suspect that like important outcomes in the work domain (González-Morales & Neves, [31]) challenge stressors may only exert their presumed positive effects in the nonwork domain when they are in fact appraised as stressors. Taken together with these other studies, our results call attention to importance of considering the appraisals of stressors as challenging or hindering, rather than the a priori categorisation of stressors as such by the challenge-hindrance framework. Furthermore, we encourage future research examining appraisals to consider not just assessing appraisals regarding the promoting or thwarting work-related goals but broadening these types of measures of challenge and hindrance appraisals to include how workers appraise job demands vis a vis their impact on nonwork.

Practical implications

The results reported here have a number of practical implications for organisations concerned about the wellbeing of their employees. Because hindrance stressors had detrimental effects on nonwork satisfaction via resource loss associated with strain and the experience of WNC we join a chorus of other researchers calling on organisations to engage in primary prevention efforts aimed at reducing hindrance stressors in the workplace. Well-known management strategies such as the use of goal setting programmes, frequent feedback, responsibility charting, and reducing unnecessary administrative hurdles (red-tape) can aid organisations interested in reducing hindrance stressors (Michie & Williams, [65]; Richardson & Rothstein, [74]). In addition to these, we encourage managers and others in the organisation to attend to symptoms of strain that may be exhibited by employees and to aid employees in their management. This could be done by offering social support and in some cases making recommendations and referrals to an organisation's employee assistance programme.

The management of challenge stressors however requires a more nuanced approach. The results reported here indicate that their overall relationship to nonwork satisfaction is decidedly negative. However, because challenges provide opportunities for employee growth and development and relate to outcomes such as engagement and performance it may not be possible nor even desirable to reduce them. As a result, it may be more appropriate to target specific leverage points in the process linking challenge stressors to outcomes in the nonwork domain for intervention. Our findings indicate that the harmful effect of challenge stressors on nonwork satisfaction occurred through the resource loss associated with strain and the experience of WNC. These findings suggest two leverage points. First, it would be important to minimise resource loss through strain. This could be done by looking to prevent strain by ensuring that workers have adequate resources in the form of control, participation and voice (Demerouti, Bakker, Nachreiner, & Schaufeli, [22]; Tadić Vujčić et al., [88]). It could also be done by limiting the negative effects of strain, for example, by making sure workers have adequate time to recover after exposure to stressful job demands (Sonnentag, Unger, & Rothe, [84]). To minimise the relationship of challenge stressors (and hindrance stressors for that matter) to WNC, organisations can implement family friendly policies such as dependent care referral and reimbursement, paid family leave,

and flexible work arrangements, which can help reduce WNC directly and indirectly by fostering perceptions of the organisation's support for families (Butts, Casper, & Yang, [9]). We also encourage managers to monitor the challenge stressors they assign or make available to their employees to help ensure that the number and type of challenges does not become overwhelming. Mentors and others who offer career advice and support are encouraged to consider, and be more forthright about, both the benefits of career development that challenges can offer in the work domain and the potential negative impacts they may have on life outside of work.

Limitations

Like all other studies the research reported here is not without limitations. First, because we conducted a meta-analysis this study was limited by the types of research designs and data collection procedures used in the primary studies. Nearly all of those studies relied on cross-sectional designs. Although we used strong theoretical arguments, testing the type of temporal ordering implied in our model requires the use of longitudinal designs (see Rindfleisch, Malter, Ganesan, & Moorman, [75]). We encourage future researchers to more directly test the temporal sequence implied in our model using well-planned longitudinal designs. The most common data collection procedure used in the primary studies was the self-report questionnaire. This is certainly appropriate for much research in the area of occupational stress where the respondent is the best source of information regarding their subjective experience of the external environment and the status of their own internal states (Spector, [85]). However, when the variables under study involve interactions with others, such as in the case of WNC and WNE, we cannot be certain that the perceptions of the respondents correspond exactly to the perceptions of their interaction partners (e.g. family members, friends, etc). This suggests that collecting data from multiple sources may provide additional insights into the relationship between work and nonwork and we encourage future research do just that. A second limitation associated with our use of meta-analysis is in regard to judgement calls made during the research process. The role of judgement calls in meta-analytic research, which cannot be avoided, has long been recognised (Wanous, Sullivan, & Malinak, [95]) and it is important to be transparent about them (Aytug, Rothstein, Zhou, & Kern, [5]). One such judgement call in the present study was the choice of inclusion criteria that required the primary studies to have contained a measure of a construct that reflected the interaction between work and nonwork in order to be included rather than, for example, any study that included any measure of a challenge or hindrance stressor and any possible strain. This choice is consistent with past meta-analytic tests of the challenge-hindrance framework. It is also consistent with methodological practice recommendations regarding inclusion criteria in meta-analysis that indicate that the broadness of the inclusion criteria match the broadness of the research question (Aguinis, Pierce, Bosco, Dalton, & Dalton, [4]). That is, we based our choice of inclusion criteria on the fact that the research questions focused specifically on the work-family interface, as opposed the challenge-hindrance framework more generally. Although many of these types of judgment calls have little impact on substantive conclusions (Aguinis, Dalton, Bosco, Pierce, & Dalton, [3]), and our fail-safe n calculations suggest a substantial number of studies with null findings would be needed to nullify this study's results, there is the possibility that different inclusion criteria and other choices may produce different results.

Another limitation is that we did not test all of the outcomes that have been typically studied in regard to the challenge-hindrance framework (Cavanaugh et al., [14]) when applied to the work domain and that we only considered two potential work-related resources as variables in the proposed model. In some cases this is because those variables examined in tests of the challenge-hindrance framework would be expected to exert their influence primarily within the work domain rather than in the nonwork domain or because they would not reflect the emotional nature of appraisals implied by the transactional theory of stress (Lazarus & Folkman, [52]). For example, job performance (e.g. LePine et al., [56]) and turnover intentions (e.g. Abbas & Raja, [2]) are behavioural indicators and more directly outcomes within work domain rather than cross domain outcomes. Still there are other theoretically relevant variables that were not included, such as other work-related resources

that could play a role in the linking job stressors with nonwork domain outcomes. Based on the propositions of the C–H framework (LePine et al., [54]) we focused on positive work affect and strain, which only represent two ways in which resources may be enhanced or depleted. Theory would suggest that other resources come in somewhat more tangible forms such as income and the acquisition of new knowledge, skills and abilities. These are sometimes referred to as constructive resources (ten Brummelhuis & Bakker, [90]) and are thought to be conveyed via a more "instrumental" pathway (Greenhaus & Powell, [35]). We encourage future research examine these constructive resources and this instrumental pathway.

It may also be the case that the specific facets of WNC and WNE may have differential relationships with these distinct resources. For example, WNC is suggested to be composed of three distinct facets including strain, time, and behaviour (Netemeyer, Boles, & McMurrin, [68]), and these different facets may be more or less predicted by specific work-related resources created from challenge stressors. In the present study we were not able to examine these specific facets. Thus, we call for a more fine-grained approach to examining a wider range of resources that are gained or lost from exposure to challenge and hindrance stressors and the relationships those have with specific facets of both WNC and WNE. Finally, we note that the present study only examined one direction of the relationship between work and family, work to family conflict and enrichment, without examining family to work conflict and enrichment. The logic for this was that the challenge-hindrance framework is a model of work-role stressors and that there is no similar model of family demands that distinguish those appraised as challenges those appraised as hinderances.

Suggestions for future research

In addition to the suggestions for future research already given, our results suggest several additional avenues for future research. Even with all of the predictors in the model variance in WNC, WNE and nonwork satisfaction remained unexplained. This suggests that there may be other intervening mechanisms that link challenge and hindrance stressors to WNC, WNE and nonwork outcomes. In addition to the tangible resources mentioned earlier, LePine et al. ([54]) suggested that two other mechanisms linking challenge and hindrance stressors to nonwork outcomes might be productive work time and control coping. Productive work time refers to motivated activity directed toward completing work tasks and it differs from challenge stressors such as work hours, time spent at work, and work pressure (LePine et al., [54]). It recognises the motivational effect that challenge stressors can have, such as focusing one's effort and concentration on demands that have the potential for growth and achievement. We note the possibility that productive work time may lead to reduced WNC/increased WNE, when it results in greater efficiency in task completion and thereby frees up time for nonwork tasks and relationships. However, this assertion has not been tested. Future research might begin by empirically distinguishing productive work time from other "time-related" constructs in the challenge-hindrance framework, as well as other motivational constructs (e.g. engagement), and then testing the role of it as a linking mechanism between work stressors to nonwork outcomes. Control coping is also known as problem-focused coping (Lazarus & Folkman, [52]). It refers to the active steps taken to manage work demands. It is possible that by learning to manage challenge and hinderance demands arising in the work domain, some of those coping strategies can become a resource that can then be used to better manage the work-nonwork interface. Again, we encourage future research to test this proposition.

Beyond examining additional resources and the enhancement/depletion processes that link work and nonwork future research could also consider the processes that underlie the transmission (or lack thereof) of resources from one domain to the other. A key assumption much work-nonwork research is that resources generated in one role (work) are deployed in the other role (family). However, this is not always the case. In order to be leveraged the resources must also be conveyed across roles. In one of the few studies to address this issue, Ilies, Keeney, and Scott ([41]) showed the importance of workers sharing their positive work experiences with nonwork interaction partners (i.e. family members) to nonwork satisfaction. They referred to this sharing of

positive experiences across domains work-family interpersonal capitalisation. Given the findings in the present study for the competing effects of positive work affect and strain it may be the case that strains prevent workers from capitalising on the resources gain associated with positive work affect.

Future research might also consider the boundary conditions under which challenges, hinderances, and their appraisals may relate to nonwork outcomes. There is a growing recognition that the a priori categorisation of challenges and hindrances do not always reflect the actual appraisals made by individual employees (e.g. Searle & Auton, [79]). This research and findings like those in the present study for example, that do not find an overall positive effect of challenge stressors as predicted by the challenge-hindrance framework, call attention to the importance of individual differences in the occupational stress process. Although largely discounted in the original formulation of the challenge-hindrance framework (Cavanaugh et al., [14]), individual differences are fundamental to the transaction theory of stress (Lazarus & Folkman, [52]) and research supports the idea that individual differences in personality-related characteristics can strengthen or weaken challenge and hindrance appraisals (Kilby, Sherman, & Wuthrich, [47]). In addition to these, variables such as autonomous work motivation (Tadić Vujčić et al., [88]), whether the job demands are imposed by the employer or self-initiated (Laurence, Fried, & Raub, [51]), and self-efficacy to meet task demands (Liu & Li, [58]) have all been shown to play a role in the relationship of challenges and hinderances with outcomes related to work. It seems likely that some of these same types of variables would moderate the relationships of challenges-hindrances and outcome in the nonwork domain. Because research examining the work-family interface considers dual roles, and individuals vary in their level of importance they attached to those roles, other potential moderators include job/family involvement, organisational/family role commitment and role salience (Shockley, Shen, DeNunzio, Arvan, & Knudsen, [80]).

Our final suggestion for future research is to consider the dynamic nature of the job stressors and reactions to them as well as their effects in the nonwork domain. In the present study we focused on chronic challenge and hindrance stressors and their relationships with state measures of positive work affect and strains. Admittedly though, most of the studies that were included were based on retrospective cross-sectional designs. It should be recognised that exposure to stressors can vary across short periods of time and so too can reactions to them. For example, studies have found that exposure to challenges and hindrances, and positive work affect can vary from day to day (Tadić Vujčić et al., [88]). Similarly, and specific to the work-family interface, Wood and Michaelides ([100]) found variation in challenge and hindrance stressors was related to WNC from week to week. Taken together, these studies suggest that some of the same types of relationships examined in the present study (i.e. that affect and strain link challenge and hindrance stressors to WNC and WNE) might be fruitfully explored using event sampling (daily diary or weekly) methods. Doing so might provide new insights into the dynamic aspects of challenge and hindrance stressors and reactions to them that are not currently represented in the literature.

Conclusion

The myth that work and family are separate roles that never intersect has long been dispelled. It is now almost inevitable that these two roles will collide— at times in detrimental ways and at times in beneficial ways. Given this fact, both researchers and practitioners have sought to better understand how job demands can impact family life. The research reported here suggests researchers and practitioners should be mindful that some job demands can be appraised as challenge stressors and other job demands can be appraised as hindrance stressors when considering the work-family interface. Those interested in work family conflict and enrichment should no longer assume that all stressful job demands are equally detrimental to either WNC and WNE nor to overall life satisfaction. This observation is consistent with one assumption of the challenge-hindrance framework and suggests its relevance to the work-family interface. However, it is even more important to note

where our results differ from the challenge-hindrance framework and call into question some of its other assumptions. In the workplace, challenge stressors have been shown to be related to favourable outcomes and some have suggested that challenge stressors at work should be increased. The logic for this is that the positive effect of challenging work outweighs the negative effects of the strains that also result. As tempting as it may be to assume that this overall net positive effect carries over into life outside of work, our results suggest that it does not. Challenge stressors predicted unfavourable outcomes outside of work and the positive affect associated with challenge stressors (gain) did not offset the negative effects of the strain associated with challenge stressors (loss).

Disclosure statement

No potential conflict of interest was reported by the authors.

Note

1 We recognise that both work-nonwork conflict and enrichment are bidirectional constructs such that work can conflict with and/or enrich nonwork and that nonwork can conflict with and/or enrich work. In the present study, however, we examine the work to nonwork direction. This is not meant to imply that the nonwork to work direction is unimportant. Rather our focus was on the challenge hindrance framework, a model of work-role stressors, and there is no similar taxonomy that parallels the C-H framework for demands in the nonwork domain.

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