

**The Job Demands-Resources model and the international work context:
A systematic review.**

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Abstract

Purpose: This systematic review provides a synthesis and evaluation of literature surrounding the Job Demands-Resources (JD-R) model (Demerouti *et al.*, 2001) with particular emphasis on establishing an evidence-based universal application towards different national and international work contexts.

Design: The study uses a systematic review approach following the stages suggested by Tranfield et al. (2003). Based on empirical data from 62 studies, we systematically analyse the application of the JD-R model and query whether it is applicable outside merely domestic work contexts.

Findings: We found convincing support for the JD-R model in different national contexts. However, we also found an absence of studies employing the JD-R model in cross-national settings. None of the empirical studies in the sample had explicitly considered the international context of today's work environment or had clearly associated JD-R research with the IHRM literature.

Research implications: Based on the wide acceptance of the JD-R model in domestic work contexts and the increased interest in work related outcomes such as burnout and engagement in the IHRM literature, our study identifies a gap and suggests future research applying the JD-R model to international work and global mobility contexts. It also provides a preview on potential job demands and resources relevant to the international work context.

Originality: This study is the first to systematically assess the application of the JD-R model in domestic and international work contexts based on a systematic review of empirical literature accumulating since the inception of the model. Our study identifies a lack of internationally focussed JD-R studies and invites further empirical research and theoretical extensions.

Keywords: Job characteristics, job demands, job resources, engagement, burnout, systematic review, IHRM, expatriates, international work

The Job Demands-Resources model and the international work context: A systematic review.

Introduction

Scholars suggest an increasing need for employees and companies to function successfully in an internationalizing environment (Stroh *et al.*, 2005; Caligiuri and Colakoglu, 2007) and increasingly stress the importance of work related outcomes such as job engagement (Lauring and Selmer, 2014) and burnout (Kraeh and Froese, 2014; Silbigera and Malach Pinesa, 2014) or employee retention (Ren *et al.*, 2013; 2014) in international work contexts. While the universal applicability of traditional HRM theories has been subject to discussion (e.g., Brewster *et al.*, 2005), some newer theories developed within a national context leave it up to future research to assess their applicability in international work contexts. We focus on the Job Demands-Resources (JD-R) model (Demerouti *et al.*, 2001) as an example of such a theory, which has received considerable scholarly interest within domestic work settings. At its core, the model assumes that whilst every occupation and context carries its own set of prominent risk factors, all job characteristics can be classified into either job demands or job resources which, through direct or interaction processes affect well-being and performance related outcomes, such as burnout and engagement (Demerouti and Bakker, 2011). However, within the international work context additional pressures arise from factors such as geographic dispersion and frequent mobility (Taylor *et al.*, 2008), which may create different types of job characteristics. This systematic review raises two questions of relevance to practitioners and scholars alike. Firstly, whether the JD-R model, developed in one national work context can cope with variations across different national work contexts and secondly whether the model is able to respond to the international imperative (Brewster *et al.*, 2005) without specific modifications and theoretical development.

Many IHRM-based empirical studies demonstrate assumptions reflective of the JD-R model. For example, adjustment (a concept considered critical for the success of international assignees; Black *et al.*, 1991; Selmer, 1999) has been associated with a number of employee and organizational antecedents and consequences, such as work itself (e.g. Kittler *et al.*, 2011a), support (e.g., training, Puck et al, 2008), motivation (Froese, 2012) and performance (Kraimer *et al.*, 2001). While recent global mobility publications address issues related to job engagement and burnout, those are rather discussed as side themes in more generally focussed studies (e.g., Suutari, 2013; Oberholster, 2013) However, with both the HRM and IHRM literature streams showing interest in related outcomes, it is surprising that not more cross-pollination takes place, as remarked in the inaugural editorial of this journal, “there is scarcely little serious academic research about this issue” (Selmer, 2013:4). In the international context, meta-analytic evidence (Hechanova *et al.*, 2003; Bhaskar-Shrinivas *et al.*, 2005) indicates that the association of components that are used to assess the relationship between job characteristics, well-being and performance-related outcomes in national settings have also been addressed in international contexts, albeit this has been based on different conceptualizations.

Following the discussion above, the overall aim of the paper is to provide a synthesis and evaluation of literature surrounding the JD-R model, pointing towards current and emerging insights. Two subsequent research objectives are (1) to analyse the use of the JD-R model in empirical research, in particular (a) the extent to which the model found empirical support in different national settings and (b) in cross-national settings and (2) to identify from current empirical literature any developments or amendments to the model that may foster its use in international contexts. It is not an objective of this paper to lead a generic discussion of whether HRM theories are applicable universally, which has already stimulated intense

discourse in the past (Wright, Snell and Dyer, 2005). Furthermore, whilst the JD-R model has been examined with respect to a range of outcomes, this review focuses solely on burnout and engagement as the original outcome variables of the JD-R model (Demerouti *et al.*, 2001).

In order to respond to the research objectives outlined above, the remainder of this paper is structured as follows. The next section will extend the presentation of the model and illustrate its major components and associations between these components. The following method section will provide detail on the modified systematic review approach employed to analyse the use of the JD-R model in empirical research and the findings resulting from these studies. The results section will present the major findings of our simplified systematic review and discuss them. The paper closes with an overview of major findings, limitations of our study and major implications for future research.

The JD-R model

Job demands (e.g., high workload, role ambiguity and role conflict) refer to any physical, social, psychological or organizational aspect of the job that requires the employee to continually engage in physical or mental effort (Bakker and Demerouti, 2007). When prolonged exposure exists, the employee can become overburdened. In an attempt to preserve energy reserves and avoid exhaustion, employees might reduce the effort expended (Van den Broeck *et al.*, 2010), often manifesting as reduced performance. Job resources (e.g., autonomy, support and job security) on the other hand refer to physical, social, psychological or organizational aspects of the job (Bakker *et al.*, 2005; Llorens *et al.*, 2006; Bakker *et al.*, 2007) that play an intrinsic motivational role by encouraging growth, learning and development and an extrinsic motivational role by being functional in achieving work goals (Demerouti and Bakker, 2011). The JD-R model assumes that resources play an important

role in preventing health impairment, but equally, they act as antecedents to motivation related outcomes such as improved commitment and dedication (Mostert, 2011). They are consequently valued in their own right because they can protect other resources, preventing a future loss of resources and enhance the process of future resource gain (Hakanen *et al.*, 2011).

The JD-R model assumes two key underlying additive effects involved in the development of well-being and performance related outcomes (Llorens *et al.*, 2006; Bakker and Demerouti, 2007; Hu *et al.*, 2011). Firstly, a health impairment pathway, whereby badly designed jobs or chronic job demands activate an energy depletion process which can lead to negative outcomes such as turnover intention (Qiao and Wilmar, 2011), sickness absence (Schaufeli *et al.*, 2009b), depression (Hakanen *et al.*, 2008) and burnout (Schaufeli and Bakker, 2004). Secondly, a motivational pathway, whereby job resources carry motivational potential leading to positive outcomes such as increased commitment (Parzefall and Hakanen, 2010), performance (Bakker *et al.*, 2008) and engagement (Bakker *et al.*, 2011a).

The JD-R model also proposes two key interaction effects between job demands and resources, which are considered important in the development of well-being and performance related outcomes. Firstly, there is the assumption that job resources buffer the negative impact of job demands on burnout. For example, high levels of job resources have been shown to reduce the relationship between job demands and work home interference (Bakker *et al.*, 2011b). Secondly and more recently the coping hypothesis proposes that job resources are particularly salient in conditions of high job demands because individuals draw on resources at times of stress as a means of coping (Bakker *et al.*, 2007). It is thought that for job resources to be the most effective at creating a motivational component, the individual

must be presented with a demand that is perceived as a positive challenge (Demerouti and Bakker, 2011).

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Methodology

A first observation when engaging with JD-R research is an inflationary use of the model since its inception in 2001. A recent look at the annual publication records relating to job demands and resources on Web of Science prior to publication of this paper shows a continuous annual increase in JD-R related publications and with increased interest outside occupational and organisational psychology, this trend is likely to remain. However, we could identify little attempt to review and assess the literature in a systematic manner. Different to this paper, the few existing attempts of narrative reviews (Bakker and Demerouti, 2007; Demerouti and Bakker, 2011) and meta-analyses (Crawford *et al.*, 2010; Nahrgang *et al.*, 2011) do not query the models application across different national, cross-national or international work contexts, a question which is frequently challenged in other areas of the global mobility literature (e.g., for expatriate adjustment, Selmer *et al.*, 2014). In order to provide a systematic and critical assessment of how the JD-R model has been used in previous literature our analysis study will employ a systematic review.

Anticipating from our initial observations that there is a lot of JD-R related research but very little with a clear international focus, a meta-analysis appears to be less suitable than a systematic review. Following Hunter and Schmidt (2004) the traditional (anecdotal)

integration of different empirical work has a maximum of 50 studies (which we will exceed with our sample and hence need a more sophisticated review method) but also suggest this number as a basic threshold for meta-analyses with the rule of thumb that “the sample size is the number of studies” (Hunter and Schmidt, 2004:446). However, as the studies containing an international dimension will be far below this threshold (see result section), a meta-analysis would not allow much insight relating to our objectives in this paper. A well-conducted systematic review however allows a broad, impartial summary of the existing research that is inclusive of different epistemologies, whilst maintaining rigor for appraising evidence (Thorpe *et al.*, 2005). We therefore argue that the systematic approach provides an essential tool for advancing evidence-based research in a particular literature stream, in our paper represented in studies based on the JD-R model and consequently providing confidence for future researchers (Petticrew and Roberts, 2006; Briner and Denyer, 2012). This paper therefore aims at closing the research gap addressed above by adopting a systematic review method.

There are a number of key principles inherent within quality systematic reviews, which this current review adhered to where possible (e.g., transparency, clarity, focus, synthesis; for a more detailed overview, see Thorpe *et al.*, 2005). To ensure rigor in our review, we conform to the stages recommended by Tranfield *et al.* (2003), considered useful for constructing a trustworthy knowledge base for future JD-R related studies. In accordance with these guidelines, experts in the outlined literature stream formed a review panel. The panel engaged in an iterative process of scoping the literature in more detail in order to generate a review question and subsequent review protocol, detailing for example, the research objectives and inclusion criteria carefully derived from review questions. A

comprehensive literature search aimed at identifying all relevant research and applying the boundaries of inclusion criteria was conducted.

The basic user-driven research questions guiding our analysis are focusing on the national contexts in which the studies were conducted and whether there is support across contexts. We were also interested in which of the studies associated with the JD-R model contain components of an international workplace and what these components or extensions are. These questions provided the basis for a review protocol. Articles referring to the JD-R model were identified using major databases. The research was restricted to non-invited, peer-reviewed English language articles (to allow full comprehension of the studies by the researchers involved) published in print or accessible by May 2011, spanning the first decade of JD-R themed research since its inception in 2001. It can be assumed that – despite the rigorous application of our search criteria – not all studies of this period referring to the JD-R model have been identified. However, it was assumed that, for instance, foreign language findings (e.g., Dutch or German, considering the origin of the JD-R model) that would contradict the majority of findings in English language papers would at least be reported to some extent in the studies included in our systematic review – which we did not find. Books, book chapters and non-peer reviewed journal articles were omitted to avoid overlap or repetition within the review. A brief discussion of conceptual work as well as work published after conducting this review allows an updated look at recent developments. We feel this approach allows an accurate depiction of pertinent scholarly research.

To assemble a representative sample of literature, the term ‘job demands-resources model’ and combinations of key terms (job demands, job resources, JD-R) were entered into EBSCO and Web of Science databases. The electronic search was supplemented with a manual search of reference lists. A total number of two hundred and four accessible articles

were identified that made reference to the JD-R model, which were subjected to further analysis. To be selected for further analysis, the studies had to meet the following criteria in order to correspond to the research objectives outlined earlier: (1) presentation within the JD-R framework, to ensure that the review solely synthesizes JD-R literature, (2) examination of individuals in a formal work setting to correspond to the work orientated nature of the JD-R model, (3) inclusion of at least two of the core dimensions of the JD-R model, being a) job demands or job resources and b) burnout or engagement, to enable appropriate examination of the major effects outlined earlier, (4) examination of at least one additive or interaction effect of the JD-R, model whether directly or indirectly via stated hypothesis, to ensure the main effects that have emerged in JD-R literature are captured and (5) use of adequate scholarly apparatus to encourage quality in the studies included in the review.

The inclusion criteria were met for sixty-two studies, which were taken into consideration for further analysis. The studies analysed are shown in table I and numbered to allow for identification in the results and discussion sections below. The analytic process involved organising results in accordance with the different additive and interaction effects. Using SPSS version 20, a Kruskal-Wallis analysis of variance test was used to assess whether the region of origin had a statistically significant effect on the level of support for the motivational and health impairment pathways. Due to the small group sizes, we were unable to run similar statistical assessments for nation, the reversed pathways, interaction effects or methodological characteristics, as the tests would lack power-efficiency (Siegel, 1957). The analysis of the results was therefore primarily limited to descriptive rather than statistical methods, with depth being sacrificed for breadth. Since data collection – beyond the descriptive categorization of articles – was qualitative (e.g., types of theories used, conceptualization of constructs, explanatory rationale), a corresponding analysis method was

required. The presentation of the findings in the following section emphasizes the geographic scope of each study, the methodology employed and the results found. Studies were categorized according to the type of effect tested, being health impairment, motivation, buffer, coping or interaction. An effect is included if the authors refer to it within their hypothesis either directly (i.e. job resources will buffer the positive relationship between job demands and burnout) or indirectly (i.e. burnout mediates the relationship between job demands and performance) and the results are presented in a readable format. A distinction is made between studies showing full, partial or no support.

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Results

Some general observations can be made from the literature. Firstly, we did observe a continuous increase in papers citing the initial work by Demerouti *et al.* (the Web of Science Core Collection counts an increase to considerably over hundred citations each year since, 2010) with a considerable amount of this research also framed within the JD-R model context. Secondly, the literature that has been published tends to represent sub-themes reflective of the additive and interaction effects within the model that have had a chance to build up an associated literature base. Thirdly, the additive effects of the JD-R model have been assessed more intensely, but this is likely to be reflective of other effects being published only in more recent years and as such, they haven't had time to build up the same literature base. Our observations will be substantiated in more detail in the remainder of this chapter.

Sixty-two studies were included in the review (see table I) and assessed according to our research objectives. Some studies used interviews for preliminary investigations. However, all based their findings on quantitative data. The study sample sizes ranged from 42 to 3506, nearly all employing a mixed gender sample. There was a range of occupations, with no particular weighting to an industry or job type. Response rates ranged from 13 % to 90 %. The participants in the studies of our sample were drawn from a range of 16 different countries. However, a European bias regarding nationality of participants and national origin of the institutions where researchers were employed was observed, particularly in the early years with JD-R model research branching into different national contexts only more recently. Twenty-one studies used participants from the Netherlands (34 %), seven used participants from Finland (11 %) and the U.S. (11 %) and five studies employed Australians (8 %). Taking a regional perspective, a total of forty studies (64.5 %) were conducted within Europe, nine in Northern America, five in Australasia and for each in Asia and Africa.

Only three of the studies analysed provided a cross-national comparison (Llorens *et al.*, 2006; Salanova and Schaufeli, 2008; Van den Broeck *et al.*, 2010) and none of the studies contained theoretical advancements of the JD-R model, which would consider any characteristics specific to international work settings (e.g., those presented within foreign assignments). The cross-national comparisons were based on data of participants within European countries from Spain, the Netherlands and Belgium. A further two studies drew on participants from more than one European country, however both treated the sample as one (Xanthopoulou *et al.*, 2008; Sonnentag *et al.*, 2010). Apart from the intra-European comparison, none of the studies were set in a cross-regional setting, for instance comparing the U.S. and Europe, the U.S. and Asia or Europe and Asia. These cross-national studies showed that although the strengths and types of associations differed across methodologies,

the basic assumptions of the JD-R model were supported. A detailed list of the regional and national origin of studies is also presented in Table II.

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Regarding study design, there were forty-four cross-sectional studies (71%) and eighteen longitudinal studies (29 %) included within the review. For longitudinal studies, there was a range from two to five measurement points and a range from five days to three years. For two studies, the measurement points were unknown. Out of forty-seven studies measuring a dimension of burnout, forty (85 %) used a version of the Maslach Burnout Inventory (Maslach and Jackson, 1986), four (9 %, Demerouti *et al.*, 2001; Bakker *et al.*, 2004; Sonnentag *et al.*, 2010; Karatepe, 2011) used the Oldenburg Burnout Inventory (Demerouti and Nachreiner, 1998, Demerouti, 1999), two (4 %, Akkermans *et al.*, 2009; Brenninkmeijer *et al.*, 2010) used the Utrecht Burnout Scale (Schaufeli and Van Dierendonck, 2000) and one (2 %, Thomas and Lankau, 2009) used the Gillespie-Numerof Burnout Inventory (Gillespie and Numerof, 1984). Of thirty-four studies measuring a dimension of engagement, thirty-three (97 %) used a version of the Utrecht Work Engagement Scale (Schaufeli *et al.*, 2002) and only one study (3 %, Hansez and Chmiel, 2010) used items from the Positive and Negative Occupational States Inventory (Barbier *et al.*, 2009).

Assessing the additive effects, forty-two of forty-three studies found empirical support for the *health impairment pathway*. Twenty-eight studies (65 %) demonstrated full support, fourteen (33 %) partial support, and one no support. Of the forty-two studies

demonstrating support, twenty-four were conducted within Europe, four in Australia, nine in the U.S. and Canada, three in Asia and two in South Africa. We could not observe an apparent difference in the level of support regarding study design, measurement, sample, country of origin or burnout dimensions assessed. A Kruskal-Wallis analysis of variance test indicated no statistically significant difference between studies demonstrating full support (Mean Rank = 22.07), partial support (Mean Rank = 22.50) and no support (Mean Rank = 13.00) that could be attributed to region of origin, H (corrected for ties) = 0.677, $df = 2$, $p = 0.713$, Cohen's $n^2 = 0.016$.

For the *motivational pathway*: twenty-nine of thirty studies provide empirical support. Twenty-three studies demonstrated full support, six (20 %) partial support and one no support. Of the twenty-nine studies demonstrating support, twenty-three were conducted in Europe, two in Australia and four in South Africa. No notable difference was observed between studies showing no, full or partial support regarding study design, measurement, sample, country of origin or burnout dimensions assessed. A Kruskal-Wallis analysis of variance test indicated no statistical difference between studies demonstrating full support (Mean Rank = 16.41), partial support (Mean Rank = 12.50) or no support (Mean Rank = 12.50) that could be attributed to region of origin, H (corrected for ties) = 2.181, $df = 2$, $p = 0.336$, Cohen's $n^2 = 0.075$.

The number of studies assessing the *reversed pathways* is too little to allow for any patterns or further explanations to be identified. Assessing the interaction effects, fourteen of sixty-two studies examined whether job resources carried a *buffering effect* for the health impairment pathway. Six studies demonstrated full support, seven partial support and one no support. Regarding the *coping hypothesis*, three studies assessed whether job resources become particularly important in the presence of high job demands. One study demonstrated

full support and two demonstrated partial support. There was no notable difference between studies demonstrating full, partial or no support regarding measurement, sample size or characteristics, country of origin or burnout and engagement dimensions assessed. As with the reversed pathways, the number of studies is too small to legitimately identify any (national or regional) patterns.

Discussion

As can be seen, almost all of the effects received support (albeit at different levels across nations), suggesting that the JD-R model can act as a valuable tool for predicting burnout and engagement across national contexts. As there was no apparent difference regarding methodological characteristics that could be attributed to different levels of support, explanations need to be sought elsewhere. As noted above, recent JD-R literature points at a distinction in job demands whereby hindrance and challenge demands have different relationships with burnout and engagement (Crawford *et al.*, 2010) and the inclusion of personality-based characteristics as potential moderators of the JD-R assumptions (Xanthopoulou *et al.*, 2007a). It is possible there are mixed findings regarding the degree of support because the distinction in job demands or a third interaction effect has not been accounted for in previous literature. Whilst out-with the scope of our review (and also due to a limited literature base for more recent assumptions), it would be interesting to confirm or deny whether these two recent developments influence the level of support for JD-R assumptions across different national, cross-national or even international contexts.

As none of the studies included in this review incorporate empirically backed theoretical developments that consider the international work dimension, presenting results in relation to research objective two was problematic. We located only one paper, which placed

the JD-R assumptions explicitly within an international assignment context. The theoretical contribution by Lazarova *et al.* (2010, which as an example found empirical support in a study by Cole and Nesbeth, 2014) draws on the JD-R model and contagion theory to increase understanding of expatriate performance within the work-family interface. However, as this paper is of a conceptual and not empirical nature it was not included in the review process as it failed to fulfil the inclusion criteria for our review of empirical studies as outlined above. Due to the increasingly international character of the work context in many organisations, this finding identifies a key challenge to further theoretical and empirical contributions. While our results point at a neglect of the international dimension of work, we do not allege scholarly ignorance. A potential explanation beyond the simple claim of universal applicability could be that empirical support may have facilitated a simplified and unaltered extension of the JD-R model to international work contexts (e.g., expatriation or international business travel). As an example the cross-national studies outlined above are based primarily on different samples in one national context and largely ignore the need for adjustment to rapidly changing environments (Salanova and Schaufeli, 2008). However, as the latter is considered as one of the critical factors of the international work context (Bhaskar-Shrinivas *et al.*, 2005) underpinning the constant change in work characteristics, we can assume that the model is likely to successfully respond to the international work context.

Whilst there is a lack of cross-national studies employing the JD-R model, from what does currently exist, it offers confidence in its generalizability that encourages further research, more specific to the international dimension. For models to be confidently used by practitioners operating internationally, it is important to avoid assumptions of universal applicability. The notions behind such critical HRM models need to be backed by empirical evidence that also demonstrates validity as an IHRM model. This review therefore highlights

that the challenges of an international workplace are still to be considered and included in a (possibly extended or modified) JD-R model. Associated future research would be advised to concentrate on samples and contexts based explicitly within the international work context, such as foreign assignees, to ensure a high degree of ecological validity.

Our systematic review makes additional observations that develop paths for future research in an effort to further advance the JD-R model. Firstly, the majority of studies used self-report measures, potentially increasing the risk of common method bias. Secondly, there was no notable difference in study findings that could be attributed to measurement instruments for burnout and engagement, suggesting that JD-R related research should be open to using a wide array of measurement instruments. Thirdly, different levels of support for the reversed motivational pathway and health impairment pathways render it a worthwhile endeavour to assess whether loss spirals exist in the latter (Houkes, Winants and Twellaar, 2008). Fourthly, forty-four studies adopted a cross-sectional design, implying that (a) the results need to be interpreted with a degree of caution and (b) causality cannot be determined. Future research should add to previous efforts by adopting longitudinal designs, which allow more robust assumptions on causal mechanisms in the model. Furthermore, the pattern of publications outlined earlier suggests that within the HRM literature, the model has captured the interest of researchers and there is a high likelihood it will attract more attention from academics in the future (spilling over from psychology into HRM and IHRM) potentially employing the JD-R model also as a popular predictor and tool for managing well-being and performance related outcomes of expatriates, with results being disseminated for use by practitioners. As the JD-R literature stream continues to grow, so will the identified sub-themes and could extend to incorporate blind spots relating to recently identified or suggested extensions of the model (i.e. personal resources and distinction in job demands).

Looking beyond the results of our review of the initial decade of empirical JD-R related research, we would in line with Lazarova et al (2010) assert that the international workplace entails uncertainty and stress but also provides new opportunities and challenges which could manifest in an international edition of the JD-R model. For instance, in an exploratory study aiming to identify job demands and resources specific to international business travellers (IBTs) Wilcox and Kittler (2013) suggest that while there might be overlaps to predictors in the domestic HR and JD-R literature (e.g., workload, autonomy and support, the latter similar to the finding of Mahajan and De Silva, 2014) there are demands and resources specific to the IBT context. Exemplary job resources for IBTs are seen in the availability of recovery time and the quality of and support in arranging travel and autonomy in travel related decisions. Potential job demands are found in the intensity of travel, (low) quality of travel, recovery time and (potentially) more demanding schedules of the IBTs. The central role of intensity of travel and recovery time for influencing other work characteristics could consequently represent important moderators within an international JD-R model. Managers involved with IBTs or IBTs themselves might be well advised to monitor and possibly alter such specific job demands and resources in their daily practice to reduce negative and enhance positive work related outcomes.

Despite this practical extension to existing research, our review results could be seen to suggest that a robust international extension or adaptation of the JD-R model still has to be developed. A possible basis for advancing an internationally robust JD-R model might be found in works such as the three factor taxonomy of global work experiences proposed by Shaffer et al (2012), demonstrating the importance of the individual's degree of physical mobility, cognitive flexibility and potentially non-work factors (the latter albeit to a lesser degree). In order to follow shift towards positive psychology the interest in predictors of

positive work-related outcomes in an international work context could be a particularly interesting avenue of future research (e.g., Ren *et al.*, 2014). This focus might also allow a more differentiated view on different dimensions of engagement and their varying effects on work outcomes. Luring and Selmer (2014:19) recently speculate following their study on expatriate academics “that engagement may work differently in an international setting where much is demanded of the individual in terms of adjusting and functioning in a new context”. While these newer insights do not undermine the basic logic of the JD-R model and its applicability for business practice, they demand for additional scholarly work in international work contexts.

Conclusions, Implications and Limitations

Aiming to systematically review empirical research following the inception of the JD-R model in 2001 we were particularly interested in finding (1) whether previous research supports the model across different national or international work contexts and (2) any developments or amendments made to the model in response to the international work context, which might represent emerging insights. Our review found solid empirical support for the JD-R model across different national settings, making it a promising tool for predicting burnout and engagement. We were surprised to find that prior work assessed has not considered the international dimension of today’s work environment and only three studies employed in this systematic review used the JD-R model in a comparative context across different countries. At the same time, studies in the IHRM literature seem to address similar questions such as the role of job characteristics for burnout in international work contexts (Bhanugopan and Fish, 2004) but without any reference to the JD-R model. Only more recent literature seems to discover elements of the JD-R model for empirical work on

expatriates (Kraeh and Froese, 2014; Lauring and Selmer, 2014; Mahajan and De Silva, 2014; Ren *et al.*, 2014).

While it would also appear reasonable to recommend a reduction of job demands in an international setting and – whilst the latter may be less feasible in complex international assignment contexts – an increase in job resources available to the employees embedded in the international assignment context, we see the latter as a considerable research gap that impedes a holistic understanding of the JD-R model and how to manage burnout and engagement in different contexts. Our findings clearly call for conceptual and empirical research on antecedents and consequences of employee well-being, assessing (a) the external validity of the JD-R model towards and (b) any required theoretical extensions for use within both cross-national and international work contexts, relating to work outcome themes like burnout and engagement which already represent emerging sub-themes in the global mobility literature. As previous JD-R research has shown a regional focus on rather stable Western country contexts (e.g., Europe and U.S.), future studies could focus on expatriation or international business travel to (or from) less researched regions and add to ongoing efforts of empirical IHRM research to remove ‘blind spots’ of under-researched regions. A possible focus could be on how the JD-R assumptions hold for assignments to countries that bear high political and social risks which are associated with significantly higher stress levels for the individual and already have found empirical interest in the expatriate literature (Bader *et al.*, 2013, Bader and Berg, 2013).

Despite our efforts to provide a rigorously conducted systematic review following accepted standards, our study is subject to some limitations. Firstly, a distinction is not drawn between studies that assess the JD-R model additive or interaction effects in a direct or indirect manner. This may carry implications regarding the level of support for the JD-R

effects and represents an opportunity for further research. However, this was not a primary objective of our research. Secondly, we agree that the focus on English language publications, a file drawer bias or the selection of a limited array of databases could be points of criticism but to our knowledge and exchange with academic peers we are confident that our sample is an adequate representation of empirical studies related to the JD-R model. We follow the argument of authors from other systematic reviews (e.g., Kittler *et al.*, 2011b) and assume saturation or at least a degree of decreasing marginal utility.

A major contribution of our study is our finding that collectively the JD-R model's underlying principles are supported across different national contexts - and in a small degree, cross-national contexts, therefore substantiating in an evidence-based comprehensive fashion the potential for universal applicability. This synthesis of JD-R model literature allows us to draw conclusions "about what we currently know and do not know about a given question or topic" (Briner and Denyer, 2012). Consequently, knowledge dissemination regarding a lack of empirical consideration for establishing ecological validity towards the international work context is important to set the stage for theory direction and stimulate the emergence of future high quality studies that can progress knowledge within the field. A recent starting point were papers relating to burnout and engagement in expatriation contexts discussed within the Expatriate Management Track at European Academy of Management (Kraeh and Froese, 2014; Luring and Selmer, 2014). This should be followed up by further systematic and rigorous empirical research. In addition, we recommend studies and discourse theoretically embedding and applying the model within the international work context, the latter becoming increasingly important as managers and organizations are forced to operate on a global scale. Moreover, as suggested earlier, given the expected onset of an increasingly international business world, practitioners are likely to look towards HRM models that have been verified

in a scholarly manner (or contribute to attempts of verification), as opposed to simply assumed to be able to respond to the international imperative.

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Table I: Studies included in the systematic review (alphabetical order)

No.	Reference	No.	Reference (Cont'd)
1	Akkermans et al. (2009)	32	Kulik et al. (2009)
2	Bakker and Bal (2010)	33	Lee (2011)
3	Bakker et al. (2003a)	34	Lee et al. (2010)
4	Bakker et al. (2005)	35	Lewig and Dollard (2003)
5	Bakker et al. (2003b)	36	Lewig et al. (2007)
6	Bakker et al. (2003c)	37	Llorens et al. (2006)
7	Bakker et al. (2004)	38	Lu et al. (2011)
8	Bakker et al. (2007)	39	Makikangas et al. (2010)
9	Bakker and Schaufeli (2008)	40	Mauno et al. (2007)
10	Brenninkmeijer et al. (2010)	41	Peng and Chiu (2010)
11	Brummelhuis et al. (2010)	42	Perry et al. (2008)
12	De Lange et al. (2008)	43	Prieto et al. (2008)
13	Demerouti et al. (2001)	44	Rothmann and Joubert (2007)
14	Dikkers et al. (2010)	45	Rubino et al. (2009)
15	Dollard and Bakker (2010)	46	Salanova and Schaufeli (2008)
16	Grawitch, Barber and Kruger (2010)	47	Schaufeli and Bakker (2004)
17	Hakanen et al. (2005)	48	Schaufeli et al. (2009a)
18	Hakanen et al. (2006)	49	Schaufeli et al. (2009b)
19	Hakanen et al. (2011)	50	Siltaloppi et al. (2009)
20	Hakanen et al. (2008)	51	Simbula (2010)
21	Hall et al. (2010)	52	Sonnentag et al. (2010)
22	Hansen et al. (2009)	53	Thomas and Lankau (2009)
23	Hansez and Chmiel (2010)	54	Tims et al. (2011)
24	Houkes et al. (2008)	55	Van den Broeck et al. (2010)
25	Hu and Schaufeli (2011)	56	Van den Broeck et al. (2008)
26	Jackson et al. (2006)	57	Williams et al. (2009)
27	Jourdain and Chenevert (2010)	58	Williams et al. (2010)
28	Karatepe (2011)	59	Wittmer and Martin (2010)
29	Kim and Stoner (2008)	60	Xanthopoulou et al. (2009)
30	Knudsen et al. (2009)	61	Xanthopoulou et al. (2007b)
31	Kuhnel and Sonnentag (2011)	62	Xanthopoulou et al. (2008)

Table II: Regional/Country study scope showing support for the assumptions of the JD-R model¹.

Region -Country	Total N=62 ²	Health Impairment Pathway			Motivational Pathway			Buffer Hypothesis			Coping Hypothesis		
		Full support	Partial support	No support	Full support	Partial support	No support	Full sup.	Part. sup.	No sup.	Full sup.	Part. sup.	No sup.
Europe	40												
-Belgium	4	55*, 56			12, 23, 56								
-Finland	7	20, 50	18		8, 19 ^{MR} , 20, 50	18, 40		8			8	17	
-Germany	3	13, 31, 52 ³				13							
-Greece	1					60							
-Italy	1	51					51						
-Netherlands	21	1, 3, 5, 6, 7, 11, 37*, 48, 55*	9, 10, 24, 47, 49	24 ^R	2 ^{MR} , 7, 14, 46*, 47, 49 ^{MR} , 54, 55*	10, 37		1, 61	4, 6, 49	7		6	
-Spain	3	37*	43		43, 46*								
-Sweden	1		22								22		
-Switzerland	1	52 ³											
-Turkey	1			28				28					
Australasia	5												
-Australia	5	15, 21 ^{MR} , 35, 36			15			32					
Americas	9												
-Canada	2	27	34										
-US	7	16, 29, 42, 53, 59	30, 45	29 ^{MR}				16	29				
Asia	4												
-China	3	25, 41			25								
-Korea	1		33								33		
Africa	4												
-South Africa	4		26, 44		26, 44, 57, 58						44		

¹ Each number in the below columns refers to the study number found in table I.

² The total numbers within regions/countries exceed the total number of studies assessed as some studies focus on more than one country.

³ Study conducted across two countries, yet considered as one sample: No. 52, Germany and Switzerland.

* Studies providing cross-country comparisons: No. 37, Netherlands and Spain; No. 46, Netherlands and Spain; No. 55, Netherlands and Belgium.

^R Support of reverse pathway only, ^{MR} Support for main and reverse pathway.

Figure I: Key assumptions of the JD-R model

