

Resources, well-being and performance

## **Workplace resources to improve both employee well-being and performance: A systematic review and meta-analysis**

Abstract

Organizations are becoming increasingly aware of the importance of employees in gaining and maintaining competitive advantage. The happy worker-productive worker thesis suggests that workers who experience high levels of well-being also perform well and vice versa, however, organizations need to know how to ensure such happy and productive workers. The present review and meta-analysis identifies workplace resources at the individual, the group, the leader and the organizational levels that are related to both employee well-being and organizational performance. We examine which types of resources are most important in predicting both employee well-being and performance. We identified 84 quantitative studies published in print and online from 2003 to November 2015. Resources at either of the four levels were related to both employee well-being and performance. We found no significant differences in employee well-being and organizational performance between the four levels of workplace resources, suggesting that interventions may focus on any of these levels. Cross-sectional studies showed stronger relationships with well-being and performance than longitudinal studies. Studies using objective performance ratings provided weaker relationships between resources and performance than self-rated and leader/third party rated studies.

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## **Introduction**

The happy worker-productive worker thesis states that employees high in well-being also perform well and vice versa (Wright & Cropanzano, 2000). A limitation of this thesis is that it does not establish the antecedents of such states and thus offers organizations little guidance as to what they can do to promote workers who are both happy (or high in well-being) and productive (have high performance). In the desire to drive employee well-being, and organizational growth and performance, there has been an increasing interest in resources at work. Day and Nielsen (in press) identify psychologically healthy workplaces as those workplaces where resources at the individual, group, leader and organizational level are promoted to ensure employee well-being and performance. As research on resources has expanded rapidly in the past decade since the presentation of the Job Demands-Resources (JD-R) model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001), there is a need to synthesize the empirical studies in the field to provide an overview of the resources most often explored, examine whether they are related to employee well-being and performance, and understand the possible moderators of the relationships between resources and well-being and performance.

The aims of the present literature review and meta-analysis are to: 1) bring together two largely separate strands of research on workplace resources, well-being and performance from the Human Resource Management (HRM) and the Applied/Organizational Psychology literatures; 2) offer a framework for classifying workplace resources based on the source of these resources, i.e. whether the resources are inherent in the individual, reside within the social context – either horizontally (the work group), or vertically (the immediate leader), or are afforded by the way work is organized, designed and managed, e.g. through job design or Human Resource (HR) practices; 3) provide an overview as to which types of resources are examined in relation to both employee well-being and performance at each level, 4) provide valuable input to organizations and researchers on whether they should focus on developing

Resources, well-being and performance

interventions at the individual, group, leader or organizational levels when aiming to improve both employee well-being and performance, and finally, 5) examine the potential moderators which may influence the relationships between resources and well-being and performance.

The contribution of the present literature review and meta-analysis is unique in that it goes beyond existing systematic literature reviews and meta-analyses, most of which have emphasized resources at one level, e.g. the individual (Claessens, Eerde, & Rutte, 2007), the group (Balkundi & Harrison 2006), the leader (Judge & Piccolo 2004), or the organizational level (e.g., van de Voorde, Pauwe, & van Veldhoven, 2012) or they have focused on either employee well-being or performance as an outcome (Halbesleben, 2010; Häusser, Mojzisch, Nielsen, & Schulz-Hardt, 2010; Skakon, Nielsen, Borg, & Guzman, 2010; Judge & Piccolo 2004). By exploring simultaneously, the impact of resources in relation to well-being and performance, the present review minimizes the potential to draw conclusions about relationships that may have been influenced by questionnaire measures or sample sizes specific to a particular study or by the organizational context. Rather than defining workplace resources upfront, we manually searched high impact journals. As resources have only recently gained mainstream popularity, we initially restricted our search to the period between 2003 and end of 2013 using a rigorous systematic approach that allowed a flexible search for a wide range of workplace resources. Immediately prior to submission, we manually searched journals from the period end of 2013 to end of 2015.

### **Background: Defining resources, performance and well-being**

Resources are defined as “anything perceived by the individual to help attain his or her goals” Halbesleben et al. (2014, p. 6). Resources thus enable employees to successfully complete their tasks and goals, as a way to enhance their well-being and capacity to perform well (Bakker & Demerouti 2007; Balducci, Schaufeli, & Fraccaroli, 2011). In the present paper, we focus on resources present in the workplace, i.e. resources that may help employees

## Resources, well-being and performance

achieve their work tasks goals and that organization may develop. We do not include resources outside the workplace nor the interaction of the work-family interface in recognition of the debate as to whether organizations should or could influence resources outside of work (Hall & Richter, 1988).

A criticism of existing research is that resources are not clearly identified. Based on previous research on how organizations may promote a psychologically healthy workplace, we classify resources according to their source (Day & Nielsen, in press, Nielsen & Abildgaard, 2013). We propose that workplace resources may be operationalized at multiple levels of the organization, i.e. the Individual, Group, Leader and Organizational (IGLO) levels, to improve employee well-being and enhance performance (Day & Nielsen, in press).

First, resources may be inherent within the individual, i.e. personal characteristics or behaviours may enable the individual to cope with the demands of the job and perform well. Examples of such resources include self-efficacy, competence, and self-esteem (Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007). Second, the social context may afford workplace resources, i.e. group-level resources associated with shared relationships that foster a quality exchange of information and interaction between individuals within the workplace. Group-level workplace resources may be identified in terms of social support and good interpersonal relationships between employees. Reviews have explored the relationship between teamwork and performance (Maynard, Matheiu, Gilson, O'Boyle, & Cigularov et al., 2013; Balkundi & Harrison, 2006).

Third, it is well-established that leaders, by virtue of their position of power, influence performance and employee well-being within the organization (Kelloway & Barling, 2010). Leader-level workplace resources include leadership characteristics and social interactions between leaders and employees. Typical leader-level workplace resources may include leadership style and the quality of leader-member exchanges. Finally, organizational-level

## Resources, well-being and performance

resources are those resources inherent in the way work is organized, designed and managed (Nielsen, Randall, Holten, & Rial-Gonzalez, 2010). A number of occupational and organizational theories stipulate the influence of job design on performance and well-being, e.g. Hackman and Oldham's (1976) Job Characteristics Model (JCM), Karasek and Theorell's Demand-Control model (DC model; 1990) and the JD-R model (Demerouti et al., 2001). From the Human Resource Management (HRM) literature, the mutual gains model suggests that HR practices, i.e. the policies and practices put in place to develop employees' skills and abilities, motivate them to perform well, and provide opportunities for employees to exert discretionary effort (Jiang, Lepak, & Baer, 2012), are related to both employee well-being and performance (van de Voorde et al., 2012). Examples of organizational-level resources include autonomy, skills variety, compensation schemes and performance appraisals. To the best of our knowledge this is the first meta-analysis to simultaneously examine the relationships between HR practices and well-being and performance.

We propose that workplace resources at any of the four levels may impact on employee well-being and organizational performance. We suggest that the IGLO-classification can be perceived as a heuristic model and as a starting point in the effort to clarify and classify resources in the workplace.

We chose to include a wide range of resources at the four levels to get an overview of whether resources afforded by the individual, the group, the leader or the organization may be related to both well-being and performance. The underlying principle is that we test clusters of resources to identify which sources organizations may target when aiming to promote a psychologically healthy workplace. We acknowledge that particular organizational-level resources may affect different aspects of an individual's well-being, e.g. compensation schemes may be related to job satisfaction while autonomy may be related to vigour, but together, all organizational-level resources improve overall well-being. Similarly, all group-

## Resources, well-being and performance

level resources have combined/overall impact on the performance of the group. By categorising the resources according to the IGLO coding scheme, we emphasize the overall combined importance of clusters of resources at each level.

Studies have often measured performance as objective (or externally-rated) and subjective (or self- or other-rated) performance. Objective performance refers to non-self-reported workplace outcomes that are neither influenced nor measured by individual raters' perceptions. Typical objective performance indicators include reports on sales performance, financial profits, productivity (e.g., Paré & Tremblay 2007). In the present study, we refer to these types of measures as objective-data performance.

Subjective performance, on the other hand, refers to self-reported performance based on individual raters' personal judgement of their own performance or their perceptions of the organization's performance. Subjective performance can be rated by the employee him- or herself (self-rated performance) or the leader or colleagues (other-rated performance). Subjective performance may be influenced by factors such as individuals' positive or negative emotional states, perceived organizational support, and interpersonal relationships with supervisors and colleagues. In the present review, we included studies that examined either subjective or objective performance or both.

We adopted the broad definition of well-being developed by Danna and Griffin (1999). They define employee well-being as the state of individuals' mental, physical and general health, as well as their experiences of satisfaction both at work and outside of work. In this light, employee well-being is influenced by the pleasure or displeasure derived from the job itself, as well as individuals' interactions with colleagues, teammates and supervisors. Employee health is considered a sub-dimension of employee well-being (Danna & Griffin, 1999). Well-being comprises both psychological outcomes such as lack of distress, anxiety, and emotional exhaustion, and physiological outcomes such as blood pressure, heart condition,

Resources, well-being and performance

and general physical exhaustion (Danna & Griffin, 1999). In the present study, we include studies that measure employee well-being in terms of positive outcomes such as job satisfaction, happiness, organizational commitment, intention to remain with the organization, work engagement, sense of purpose, and affective well-being. We also consider general physical and psychological health and include both work-related and non-work related well-being outcomes. Previous research has found that workplace resources are related to non-work-related well-being (Grebner, Semmer & Elfering, 2005; Kinnunen, Feldt, Siltaloppi, & Sonnentag, 2011) and therefore we included both work-related and non-work related well-being. We argue it is positive if work can have a positive spillover to non-work domain.

### **Workplace resources, employee well-being and organizational performance**

According to the JD-R model, workplace resources have motivational potential and may lead to high well-being through two mechanisms (Demerouti et al., 2001). Through intrinsic motivation, resources may fulfil basic human needs, such as the needs for autonomy, competence, and relatedness (Deci & Ryan, 1985). Through extrinsic motivation, workplace resources may enable the individual to achieve their work goals and thus perform better (Demerouti et al., 2001). For example, supportive leaders and colleagues who provide instrumental support in completing work tasks may increase the individual's capacity to complete his or her work goals, thus leading to greater job satisfaction and better performance. The JD-R model has been validated in that the relationship between workplace resources and employee well-being has been established in meta-analyses (Crawford, LePine, & Rich, 2010; Halbesleben, 2010), and studies have confirmed the relationship between workplace resources and performance (e.g. Bakker, Demerouti, & Verbeke, 2004) although this relationship has yet to be confirmed using a meta-analytic approach. A central tenet of the JD-R model and Conservation of Resources (COR) theory is that resources may take many forms and there is no defined set of resources (Demerouti et al., 2001), it is therefore

## Resources, well-being and performance

essential to use a flexible approach to identifying which resources to include in a meta-analysis.

Research has shown that interventions can improve resources at all these four levels (Michie & Williams, 2003; van der Klink, Blonk, Schene, & van Dijk, 2001); thus, it is worthwhile to identify whether resources at any of the four levels are more strongly associated with both employee well-being and performance. Knowing whether individual-level resources are more strongly related to both employee well-being and performance than, for example, leader-level resources may provide valuable insights for organizations on which types of interventions they may focus their efforts. We therefore developed the following research questions:

Research Question 1: Which types of resources at the four levels are explored in the literature with regards to both well-being and performance outcomes?

Research Question 2: Are workplace resources related to both employee well-being and performance when studied as outcomes in the same study?

### **Moderators of the relationship between resources and well-being and performance**

In this section we explore potential moderators of the relationship between resources and well-being and performance. We consider the possibility that the relationships between resources and well-being and performance can be moderated by a number of factors, such as the IGLO level at which the resource operates and the study design.

#### *Levels of resource*

For decades, there has been a debate in the intervention literature as to whether organizations should focus their efforts towards promoting happy and productive workers through individual-level or organizational-level interventions (Martin, Sanderson, & Cocker, 2009; Richardson & Rothstein, 2008). Important questions have thus been raised concerning the extent to which

## Resources, well-being and performance

organizations should focus their intervention efforts across these levels to promote happy and productive workers and psychologically healthy workplaces.

We extend the individual- and organizational-level intervention debate by examining resources at the group and the leader levels. It is increasingly acknowledged that work groups play an important role in organizing work and creating innovations in today's workplaces (Mathieu, Maynard, Rapp, & Gilson, 2008; Peltokorpi & Hasu, 2013) and that interpersonal relationships may potentially promote health (Day, Hartling, & Mackie, 2015). Furthermore, an emergent body of literature suggests that leadership behaviours do not only influence employee performance (Judge & Piccolo, 2004), but also employee well-being (Skakon et al., 2010). Interventions focused on leaders may thus be a cost-effective means of achieving both (Kelloway & Barling, 2010). It is thus important to determine whether resources at any of the four levels are more strongly related to employee well-being and performance than workplace resources at other levels. We provide valuable information on which interventions organizations should focus on in promoting employee well-being and performance.

Research Question 3: Are resources at any of the four levels (individual, group, leader and organization) more strongly related to employee well-being and performance than resources at the other three levels?

### *Study design*

Internal validity of a study is characterized by covariation, time-order relationship, and elimination of plausible alternative causes (Shaugnessy, Zeigmeister, & Zeigmeister, 2006). Compared to longitudinal and experimental designs, cross-sectional and case studies designs tend to have lower internal validity as they do not fulfil the time-order condition and lack control over alternative explanations for their findings. A further related problem associated with cross-sectional designs is common method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). When respondents' reports of internal states, e.g. well-being are collected at

## Resources, well-being and performance

the same time as their perceptions of the resources, this may lead to inflated correlations between these two types of variables (Lindell & Whitney, 2001). Cross-sectional studies may over-report the relationship between resources and well-being and performance. One might expect the strength of this relationship to differ significantly between cross-sectional and longitudinal study designs. We therefore examine whether the temporal design of the study influenced the relationship between resources and well-being and performance.

Research Question 4: Is there a difference in the strength of the relationships between resources and well-being and performance in studies either using cross-sectional or longitudinal study designs?

### *Rating source*

To accurately estimate the relationship between resources and well-being and performance, it is crucial to have valid and accurate measures of both outcomes. Well-being represents employees' individual responses to the environment and it is therefore appropriate to measure well-being using self-reports (Frese & Zapf, 1988; Kompier, 2005). As mentioned above, performance can be rated either objectively, using organizational data such as return-on-investment or sales performance data, or subjectively through employees' self-reports or the reports of others. There have been debates concerning the extent to which subjective reports are reliable (Atwater, Ostroff, Yammarino, & Fleenor, 1998; Fletcher & Baldry, 1999).

Although some studies have found that self-rated and other-rated performance are highly correlated (Moneta, Amabile, Schatzel, & Kramer, 2010; Shalley, Gilson, & Blum, 2009), other studies have found that self-other discrepancies exist for performance ratings (e.g., Allen, Barnard, Rush, & Russell, 2000). Because of these opposing views, we examined whether differences exist between resources and performance relationships when performance is rated using either self, other or objective performance ratings.

Research Question 5: Is there a difference in the strength of the relationship between resources and self-reported, other reported and objective performance?

### **Method**

We conducted a meta-analysis to answer Research Questions 2 to 5. In this section, we first describe the literature search and then the analytical methods applied in the meta-analysis.

#### **Literature search**

As existing research frameworks such as the JD-R model (Demerouti et al., 2001) and COR theory (Hobfoll, 1989) do not specify a definitive list of resources, we decided to employ a flexible search that enabled identification of a broad range of workplace resources beyond those previously identified in existing models. We focused on high impact journals in anticipation that articles with rigorous and valid methods and designs are more likely published in such journals. A similar approach has been used in previous reviews (Doherty, Haugh, & Lyon, 2014). We began by a comprehensive search for relevant academic journals based on their rankings in the Thomson Reuters Journal Citation Reports (JCR) and the Association of Business Schools (ABS) list of high quality journals. JCR compares academic journals using citation data and measures of journals' research impact. We selected relevant high impact journals from the Management and Applied Psychology lists. The ABS list ranks academic journals in five categories (1 to 4, and 4\*), where 1 is the lowest category, 4 the highest category, and 4\* for elite journals. We selected relevant highly ranked journals from the Human Resource Management and Psychology lists. Journals considered for the present review include those with high JCR research impact ( $>1.5$ ), and those ranked in categories 3, 4 and 4\* on the ABS list. In total, 23 journals were searched. We first identified papers that included both performance and well-being measures according to our definitions above. We then identified whether any antecedents could be classified as resources.

## Resources, well-being and performance

We performed a manual and electronic search of all selected journals to identify published articles where the potential impact of workplace resources on employee well-being and organizational performance has been examined simultaneously. For example, if a study on team climate and well-being among teleworkers and performance among nurses revealed a relationship with performance, but not well-being, we cannot ascertain whether the outcomes are due to the different occupational contexts: We cannot not delineate whether team climate has little importance for well-being among people who mostly work on their own or whether team climate is universally linked to performance, but not well-being.

To reflect the recent growth in interest by researchers and practitioners on: i) importance of both employee well-being and organizational performance, and ii) increased theoretical knowledge about workplace resources, we focused on empirical studies published between 2003 and December 2015. At first, we manually searched journals from 2003 to end of 2013, but prior to submission, we updated our search to include issues up to the end of 2015. We also included papers published online first.. The vast majority of papers identified were published after 2010. One rater identified papers by searching through the journals and identifying papers that included resources, employee well-being and performance. A second rater reviewed the selected papers to ensure they all included at least one workplace resource and both employee well-being and performance outcomes. Consensus was reached through discussion between the raters, and any discrepancies were cross checked by a third rater and resolved through discussion. One rater classified the resources into the four categories and these were checked by a second rater. Again, any discrepancies were resolved through discussion. Full information on the literature search can be obtained upon request from the authors.

### *Inclusion and exclusion criteria*

## Resources, well-being and performance

We focused on empirical, quantitative studies that included correlation coefficients between a workplace resource and well-being and performance. We identified papers that included both well-being and performance outcomes (based on the definitions described above) and examined whether antecedents of these were identified and whether these antecedents could be termed as ‘workplace resources’. We used the following inclusion criteria. First, the study had to be published in a high impact journal. Second, the study had to provide a zero-order correlation between a resource and any potential outcome. Third, in order to calculate the sample size, the study had to include the sample size.

We excluded resources outside of work (e.g. family support) and negative factors that may impair well-being and performance (e.g. emotional demands) due to the explicit focus on the positive aspects of work/resources at work that may drive rather than hinder employee well-being and performance. Studies adopting laboratory research designs were excluded because they do not provide an adequate social and organizational context for employee well-being and organizational performance (Chang, Johnson, & Yang, 2007). We also excluded the grey literature, i.e. non-commercial and non-academic literature such as dissertations, conference papers, and unpublished articles as these are not usually subjected to robust and stringent editorial processes. Finally, books and book chapters were excluded as they do not often undergo the same rigorous review procedure as applied in high impact journals.

### **Meta-analytic approach**

All meta-analyses and analyses of publication bias were carried out using the Comprehensive Meta-Analysis (versions 2 and 3) software developed by Biostat (Borenstein, Hedges, Higgins, & Rothstein, 2005). In contrast to some other meta-analytic methods, such as the Hunter and Schmidt approach (Hunter & Schmidt, 2004), which weights studies by sample size, the Comprehensive Meta-analysis program weights studies by inverse variance. Inverse-variance weighting is a method of aggregating two or more random variables where each

## Resources, well-being and performance

random variable is weighted in inverse proportion to its variance in order to minimize the variance of the weighted average. The inverse variance is roughly proportional to sample size, but is a more nuanced measure, and serves to minimize the variance of the combined effect (Borenstein, Hedges, & Rothstein, 2007).

The  $Q_{\text{within}}$ -statistic was used to assess the heterogeneity of studies. A significant  $Q_{\text{within}}$ -value rejects the null hypothesis of homogeneity. An  $I^2$ -statistic was computed as an indicator of heterogeneity in percentages. Increasing values show increasing heterogeneity, with values of 0% indicating no heterogeneity, 50% indicating moderate heterogeneity, and 75% indicating high heterogeneity (Higgins, Thompson, Deeks, & Altman, 2003). As considerable heterogeneity was found in our analyses, we calculated the pooled mean effect size using the random effects model. Random effects models are recommended when accumulating data from a series of studies where the effect size is assumed to vary from one study to the next, and where it is unlikely that studies are functionally equivalent (Borenstein et al., 2007). Random effects models allow statistical inferences to be made to a population of studies beyond those included in the meta-analysis (Berkeljon & Baldwin, 2009). Under the random effects model two levels of sampling and two sources of error are taken into consideration. First, the true effect sizes are distributed about the mean with a variance that reflects the actual distribution of the true effects about their mean. Second, the observed effect for any given effect size will be distributed about that effect size with a variance that depends primarily on the sample size for that study. Therefore, in assigning weights to estimate the mean one needs to deal with both sources of sampling error, that is within studies and between studies (Borenstein et al., 2007; Borenstein, Hedges, Higgins, & Rothstein, 2009).

The “one-study-removed” procedure was used to determine whether estimates were influenced by outlier-studies. This sensitivity analysis provides average estimates for a given

Resources, well-being and performance

relationship by running a series of analyses where the overall effect size is re-estimated by removing one study in each successive analysis. That is, in the first analysis, all studies except the first are included. In the second analysis, all studies except the second are included, and so on. It is a potential shortcoming of meta-analyses that overall effect sizes can be overestimated due to a publication bias in favor of significant findings. To approach this “file drawer problem” the following four indicators of publication bias were included: Funnel Plot, Rosenthal’s Fail-Safe N, Duval and Tweedie’s Trim and fill procedure, and Egger’s Regression Intercept (Borenstein et al., 2009). The procedure proposed by Hedges and Olkin (1985) was used to investigate potential moderator effects. The presence of a moderator is indicated by a statistically significant  $Q_{\text{Between}}$ , which suggests a difference between the mean effect sizes across groups.

## Results

The literature search resulted in 84 quantitative studies covering at least one level of workplace resources. Thirty-four studies covered individual resources, 17 examined group-level resources, 31 studied leader resources, and 48 included organizational resources. The majority of studies (45) explored resources at only one of the IGLO levels, 27 studies explored resources at two levels, eight studies included resources at three levels. Only four of the included studies examined resources at all four levels. The individual resources most often studied in relation to both employee well-being and performance were the four resources of self-efficacy, hope, optimism, and resilience that together form Psychological Capital (PsyCap; Luthans & Youssef, 2004). Four studies examined all four components of PsyCap whereas self-efficacy on its own was examined in seven studies. Hope and optimism were each explored in one study. Resilience was explored in two studies, but in one study as a group level construct. Job crafting, i.e. the alterations employees make to their work in

## Resources, well-being and performance

order to change the task, relational and cognitive boundaries of their work (Wrzesniewski & Dutton, 2001) was explored in seven studies.

The group-level resources were most often studied as social support (seven studies), the fit between the group and the person (two studies) and characteristics related to the team (such as team learning or team climate; two studies). Job crafting was also explored in one study as a group level construct.

At the leader level, the resource most often studied was leader-member-exchange (LMX), i.e. a good quality relationship between leader and employees (ten studies; Graen & Uhl-bien, 1995), followed by transformational leadership (seven studies). Transformational leaders are those leaders who intellectually stimulate their employees, act as role models, formulate a clear vision for the future and show understanding for individual's needs (Bass & Riggio, 2006). Only two studies focused on transactional leadership (transactional leaders focus on fulfilling employees' needs for reward and recognition in exchange for employees completing their job requirements; Bass & Riggio, 2006) and four studies focused on supervisor social support.

At the organizational level, 15 studies examined autonomy. Only one study examined all five job characteristics of Hackman and Oldham's (1976) JCM. HR practices as a cluster were examined in four studies. Eight studies examined one or more specific elements of HR practices such as compensation based schemes (four studies), training (three studies), career supporting activities (two studies), and performance appraisals (one study). Eight studies focused on perceived organizational support (POS) and four studies examined the fit between the person and the organization. **Meta-analysis**

Weighted average relationships between the resources and the summary indicators of well-being and performance as estimated with a random effects model are displayed in Table 1. Answering research question 2, 30317 respondents and 91 independent estimates gave an

## Resources, well-being and performance

average correlation of .29 (95% CI=.23 - .34) with well-being. High levels of heterogeneity were found between the studies ( $Q_{\text{within}}=2438.65$ ;  $p<.001$ ;  $I^2= 96.31$ ). A sensitivity analysis removing one study at a time resulted in 91 point estimates (one for each removal) with estimates ranging from  $r=.28$  to  $r=.29$ . It showed no ineligible impact of any study. The Duval and Tweedie's Trim and Fill procedure revealed no missing studies to the left of the mean. Altogether 18 missing studies were identified to the right of the mean. This shifted the point estimate to .37 (95% CI=.31 - .42). The classic Fail Safe N indicated that 1487 missing studies were needed to bring the p-value above the alpha level. Following the recommendations for interpretations by Sterne and colleagues (2011), a funnel plot showed that the studies were equally distributed around the mean, thus suggesting that there were no missing studies. Funnel plots are available upon request from the first author. The Egger's regression test showed that the intercept was not different from zero ( $B0=-.03$ ; 95% CI=-2.25 - 2.17), thus indicating symmetry in the included studies.

Also, in answer to Research Question 2 and based on 29,624 respondents and 92 independent estimates, the analysis of relationships between resources and performance yielded an average correlation of .21 (95% CI=.17 - .25). High levels of heterogeneity were found between the studies ( $Q_{\text{within}}=1232.28$ ;  $p<.001$ ;  $I^2= 92.62$ ). A sensitivity analysis removing one study at a time resulted in 92 point estimates (one for each removal) with estimates ranging from  $r=.20$  to  $r=.21$ , thus showing no impact of any individual study on the overall estimate. The Duval and Tweedie's Trim and Fill procedure revealed no missing studies to the left of the mean, whereas 23 missing studies were found to the right of the mean. The missing studies to the right shifted the point estimate to  $r=.27$  (95% CI=.23 - .30). The classic Fail Safe N indicated that 5695 missing studies were needed to bring the p-value above the alpha level. A funnel plot showed that the studies were more or less equally

Resources, well-being and performance

distributed around the mean. The Egger's regression test showed that the intercept was not different from zero ( $B0=.99$ ; 95% CI=-.53 – 2.51).

In summary, the answers to our First and Second Research Questions were that: a) resources had mostly been studied at the organizational level while group-level resources have received the least attention in relation to both employee well-being and performance and b) resources were significantly related to both well-being and performance.

### **Moderation analyses**

Our Third Research Question was related to the strength of the relationships between workplace resources at the four levels and well-being and performance: Are resources at some levels more strongly related to these outcomes than resources at other levels? In order to determine the impact of the level of resource (individual, group, leader, or organization) on correlations between resources and outcomes, a moderation analysis was conducted to examine average weighted correlations at the four different levels. The findings on well-being are presented in Table 2, whereas the findings on performance are displayed in Table 3. The moderator analyses for both well-being ( $Q_{between}=1.83$ ;  $df=3$ ;  $p>.05$ ) and performance ( $Q_{between}=.91.63$ ;  $df=3$ ;  $p>.05$ ) resulted in nonsignificant  $Q_{between}$ -values, thus indicating the established associations with both outcomes are consistent across levels.

In answer to Research Question 4, a moderation analysis showed no significant ( $Q_{between}=2.19$ ;  $df=2$ ;  $p>.05$ ) difference in magnitude between cross-sectional ( $K=76$ ;  $r=.30$ , 95% CI=.24 - .36) and longitudinal ( $K=10$ ;  $r=.21$ , 95% CI=.11 - .31) studies in terms of the relationship between resources and well-being. With regard to performance, cross-sectional studies ( $K=71$ ;  $r=.23$ , 95% CI=.18 - .28) reported significantly ( $Q_{between}=10.73$ ;  $df=2$ ;  $p<.01$ ) stronger associations between resources and performance when compared to studies with a longitudinal design ( $K=12$ ;  $r=.12$ , 95% CI=.06 - .18).

## Resources, well-being and performance

To determine whether rating source had an impact on the association between resources and performance (Research Question 5), we conducted a moderation analysis with rating source as the conditional factor. As displayed in Table 4, studies using objective performance data ( $K=7$ ;  $r=.09$ ; 95% CI=.03 - .15) provided a significantly ( $Q_{\text{between}}=12.05$ ;  $df=2$ ;  $p<.01$ ) smaller estimate of the associations between resources and performance when compared to leader/third party ratings ( $K=43$ ;  $r=.23$ ; 95% CI=.16 - .30) and self-ratings studies ( $K=26$ ;  $r=.23$ ; 95% CI=.16 - .30). Five performance outcomes were measured at the organizational level, whereas 25 were measured at the group level. All other performance outcomes were measured at the individual level. On interpreting this finding it should be noted that the number of objective-data studies was small, and that the objective-data studies had very low heterogeneity, that is, the effects being estimated in the different studies could be considered as relatively similar.

In summary, our examination of the moderation research questions we found no significant differences in terms of how strongly resources are related to employee well-being and performance across the four levels: Individual, group, leader and organization (Research Question 3). In answer to Research Question 4, we found that cross-sectional studies showed stronger relationships than longitudinal relationships when studying performance as an outcome, but not well-being. In response to Research Question 5, the findings showed that objective performance studies provided smaller relationships between resources and performance than self-rated and leader/third party rated performance studies.

## Discussion

Overall, our meta-analysis confirms that workplace resources in all the IGLO levels are related to both employee well-being and performance. Our main contributions are to: 1)

## Resources, well-being and performance

operationalize a four-level classification system of resources that may help organizations in determining where to focus their intervention efforts, 2) highlight the significance of resources at individual, group, leader and organizational levels that are related to both employee well-being and performance, 3) identify by meta-analyses which resources may be most strongly related to well-being and performance, and 4) illustrate potential moderators of the relationships between workplace resources and well-being and performance.

Our First Research Question considered which resources at the four IGLO levels were identified in the literature. We concluded that organizational level resources were more often explored. The organizational resource most often explored was autonomy. This is hardly surprising as autonomy plays a crucial role in prominent work environment models such as the JCM (Hackman & Oldham, 1976) and the DC model; Karasek & Theorell, 1990). Interestingly, the second most often studied organizational resource were HR practices. Recent studies providing evidence on the impact of HR practices suggest that they promote organizational performance through their positive influence on employee well-being (van De Voorde et al., 2012). This evidence is often outlined in terms of the mutual gains perspective of HRM, according to which HR practices are associated with benefits for both employees (e.g., through enhanced job satisfaction) and the organization (e.g., through workplace productivity). Sceptics of the mutual gains perspective have raised concerns that the benefits of HR practices are often skewed in favour of the organization at the expense of employee well-being (Ogbonnaya, Daniels, Connolly & van Veldhoven, 2017). They argue that HR practices are utilized primarily to drive organizational performance and may thus be experienced by employees as a form of work intensification. We found meta-analytic support for the mutual gain perspective.

The group-level variable most often studied was social support which is also a central component in the revised DC-S(ocial support) model (Karasek & Theorell, 1990). Relatively few studies examined team characteristics which may to some extent be surprising due to the

## Resources, well-being and performance

interest in group-based job design (Mathieu et al. 2006). The leader resources most often studied were LMX and transformational leadership. These two variables are some of the most studied in the leadership field (Avolio, Walumbwa, & Weber, 2009) so it is hardly surprising that they came out strongly in our review. Supervisor support which is central to the DC-S model received less attention. The individual resources attracting most scholarly attention are PsyCap, often measured as one construct, but in some studies, as subcomponents of self-efficacy, resilience, hope and optimism. Recently job crafting, i.e. the behaviours employees engage in to create a good person-environment fit, has gained popularity.

In answer to our second Research Question, we can conclude that workplace resources are related to both employee well-being and performance. These results are in line with previous meta-analyses that has examined resources in relation to well-being (Crawford et al., 2010; Halbesleben, 2010). We found that no workplace resource at a particular level was more strongly related with employee well-being and performance (Research Question 3). Together the answers to these two research questions support the JD-R model where resources play both intrinsic and extrinsic motivational role, i.e. satisfy individual needs and support the achievements of work goals, resulting in both good well-being and performance (Bakker & Demerouti, 2007). To retain statistical power, we did not explore specific resources at each level, but our literature review revealed the type of resources organizations may focus on. These resources include those that promote job crafting, social support, a good quality relationship between leaders and employees, and at the organizational level, a job design that afford a high level of job autonomy.

Research Question 4 was concerned with the extent to which the relationships between workplace resources and well-being and performance depended on the study design. We compared cross-sectional and longitudinal designs (no experimental designs were identified). We found that the relationship with performance was stronger in cross-sectional studies

compared to longitudinal studies. There are two possible explanations for this finding. First, it is possible that there may be immediate “effects” of resources, however, over time the relationships may be weaker. Another explanation may be that inflated correlations present a problem in cross-sectional designs (Lindell & Whitney, 2001). It is not within the scope of the present paper to discuss which methods may be employed to reduce the risk of inflated correlations. For an in-depth discussion we refer to Podsakoff et al. (2003) and Podsakoff, MacKenzie, and Podsakoff (2012).

Adding to the debate on whether self-reports are reliable (Atwater et al., 1998; Fletcher & Baldry, 1999), we found that the associations between resources and performance were weaker when performance was measured using existing organizational data (objective performance) compared to ratings provided by the individual or the leader or other third party. In answer to Research Question 5, we can thus conclude that there is a difference in the strength of the relationship between resources and performance depending on how performance was rated. Our results add to the debate as to whether self-other discrepancies exist for performance ratings (e.g., Allen et al., 2000). Our result suggests that employees may be biased when rating their own performance (Taris, 2006) and that common method may pose a threat (e.g. Podsakoff et al., 2003), particularly because the majority of studies included employed a cross-sectional design. Also leader or other third party ratings may be biased in comparison to objective data suggesting that objective ratings of performance should be obtained where possible and appropriate.

### **Implications for practice**

By identifying which workplace resources at the individual, group, leader and organizational levels are important to both employee well-being and performance, we provide valuable information to organizations as to which levels they should focus their workplace initiatives

## Resources, well-being and performance

and interventions to promote both employee well-being and performance. Overall, our results suggest that organizations may successfully improve employee well-being and performance through interventions aimed at building resources at any of the four levels. There is, however, a body of literature to suggest that interventions at multiple levels are preferred due to the potential synergistic effects. For example, teamwork structures can be implemented to build social capital (group-level resource), and at the same time, autonomy (organizational-level resource) may be supported by training employees in problem solving (an individual resource) and leaders on transformational leadership skills (a leader-level resource) (Nielsen, Randall, & Christensen, 2005). This illustration is consistent with a central element of COR theory (Hobfoll, 1989), which concerns the creation of resource caravans. For example, employees high in self-efficacy can more actively engage with their peers and line managers. Thus, training people in self-efficacy may create additional resources enhancing team climate and enabling leaders to exert transformational leadership behaviours (Nielsen & Munir, 2009). Studies have found that interventions may increase resources at the individual, group, leader and organizational levels (Michie & Williams, 2003; van der Klink et al., 2001) and we suggest that multilevel interventions may be a way forward based on this literature. It is important to note that interventions at some levels may be less appropriate depending on the organizational context. For example, among distributed workers, group-level interventions may be less effective than individual-level interventions.

### *Strengths and limitations*

The present review has a number of limitations that must be acknowledged. First, we constrained our search strategy to high impact journals. If we had cast the net wider and included the grey literature, i.e. non-commercial and non-academic literature, we may have identified more resources. However, a comparison between non-published and published literature reveal no differences in the percentage of non-significant correlations (Dalton,

## Resources, well-being and performance

Aguinis, Dalton, Bosco, & Pierce, 2009) suggesting that we would not have found more resources. By including only quantitative studies, we may also have lost valuable information about important contextual information provided in qualitative studies. In future research, it would be worthwhile including a qualitative or case study approach to explore the local, regional and national contexts and the dynamics between IGLO-levels in different workplaces. Our meta-analysis could thus be supplemented by meta-syntheses and/or realist syntheses.

A second limitation refers to the classification of variables. Based on our heuristic four-level model, we categorized different levels of resources as antecedents of employee well-being outcomes, for example work engagement. In some of the studies included, well-being was operationalized as an organizational resource (e.g. Shipton, West, Parkes, Dawson, & Patterson, 2006). Based on this overlap between antecedents and outcomes, there are issues in explaining the causal influence between particular resources and employee outcomes. However, we argue that, based on our four-level model and classification according to the source of the resource, there was significant evidence to support a relationship between different levels of resources and employee well-being as an outcome.

A third limitation is that although we only included studies that examined both employee well-being and performance in the same sample, not all workplace resources were tested in relation to both outcomes. Where relationships were not tested and reported we cannot know whether they were in fact tested, but not included because they showed no relationship or even the opposite relationship than expected.

Fourth, meta-analysis has been viewed as an efficient approach to synthesize research findings, especially since stronger conclusions may be reached, compared to traditional impressionistic literary reviews (cf. Hunter & Smith, 2004; Lipsey & Wilson, 2001). Although a meta-analysis does not resolve the limitations inherent in the existing individual studies, this approach has the advantage of shifting the focus to the whole body of research

## Resources, well-being and performance

on a given topic by bringing effects, strengths, and limitations of the field into sharper focus. Using such a meta-analytical approach as a remedy for the inconclusiveness in the existing literature, we add to the current understanding of the relationships between workplace resources and well-being and performance.

In the present meta-analysis, we included cross-sectional studies and we are therefore unable to conclude on reciprocal effects and causality but can only conclude that the relationships between the four levels of resources and well-being and performance can be established across a large number of studies. It should be also noted that there are, despite the cumulative strength of meta-analysis, several issues which a meta-analysis is not able to resolve and which should be considered when interpreting the findings. Reliance on self-report survey data is one commonly cited issue, raising concerns regarding socially desirable responses, as well as other data collection phenomena, such as demand characteristics.

Furthermore, it would have been interesting to explore whether resources had a stronger relationship with work-related well-being compared to non-work-related well-being, however, few studies included non-work-related well-being making it impossible to perform a reliable analysis.

Finally, it could be argued that using a very broad approach including many different types of resources under each cluster we are comparing 'apples and oranges'. For example, HR practices may serve to improve employee commitment, whereas autonomy, another organizational-level resource related to the design of the job, may be related to employees' work engagement. Although the nature and impact of each resource may vary depending on what aspect of an individual's job experience it affects, the focus of our paper is on the overall importance of clusters of resources at each IGLO level and we acknowledge that we are unable to examine unique relationships. This is a common criticism of meta-analyses and therefore also relevant to our study. **Conclusions**

## Resources, well-being and performance

Our literature review identifies workplace resources at the Individual, Group, Leader and Organizational levels that have been studied in relation to both employee well-being and performance. We offer a pragmatic classification system of resources depending on the source of the resource. Our results provide important knowledge for organizations as to how, who and what they need to target when aiming to improve both employee well-being and performance in the same intervention. At the individual level, PsyCap and job crafting were most often examined. At the group level, social support among colleagues was most often explored, at the leader level, a good quality relationship between leader and employees and transformational leadership were most often examined. Finally, at the organizational level, autonomy and HR practices have received most attention. We found that resources at all four levels were significantly related to both employee well-being and performance. Our results therefore suggest interventions focused on any of these resources, and potentially in combination, may be successful in improving both employee well-being and performance.

Another contribution of the present study is the overview of where the research on resources has to date been focused. Organizational-level resources are more often studied while resources at the individual, group, and leader levels have received less attention. Future studies should focus on how workplace resources may impact both employee well-being and performance to create mutual gains. Research is needed to explore which interventions and ways of implementing them may help organizations develop workplace resources to promote happy and productive workers.

## References

Note: A complete list of references for papers included in the meta-analysis can be found on the first author's ResearchGate webpage URL.

- Atwater, L. E., Ostroff, C., Yammarino, F. J., & Fleenor, J. W. (1998). Self-other agreement: does it really matter? *Personnel Psychology, 51*, 577-598.
- Avolio, B. J., Walumbwa, F. O., & Weber, T. J. (2009). Leadership: Current theories, research, and future directions. *Annual Review of Psychology, 60*, 421–449.
- Bakker, A., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of Managerial Psychology, 22* (3), 309–328.
- Bakker, A. B., Demerouti, E., & Verbeke, W. (2004). Using the Job Demands – Resources Model to predict burnout and performance. *Human Resource Management, 43*, 83–104.
- Balducci, C., Schaufeli, W., & Fraccaroli, F. (2011). The job demands–resources model and counterproductive work behaviour: The role of job-related affect. *European Journal of Work and Organizational Psychology, 20* (4), 467–496.
- Balkundi, P., & Harrison, D. (2006). Ties, leaders, and time in teams: Strong inference about network structure's effects on team viability and performance. *Academy of Management Journal, 49*, 49–68.
- Bass, M. B., & Riggio, R. E. (2006). *Transformational leadership*. Mahwah, NJ: Lawrence Erlbaum.
- Berkeljon, A., & Baldwin, S. A. (2009). An introduction to meta-analysis for psychotherapy outcome research. *Psychotherapy Research, 19* (4-5), 511–518.
- Borenstein, M., Hedges, L., Higgins, J. P. T., & Rothstein, H. (2005). *Comprehensive Meta-analysis Version 2*. Englewood, NJ Biostat.
- Borenstein, M., Hedges, L., & Rothstein, H. (2007). *Meta-analysis. Fixed effects vs. random effects*. Englewood, NJ Biostat.

Resources, well-being and performance

Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2009). *Introduction to Meta-Analysis*. Chichester, West Sussex: Wiley.

Chang, C.H., Johnson, R.E., & Yang, L.Q. (2007). Emotional strain and organizational citizenship behaviours: A meta-analysis and review. *Work & Stress*, *21*, 312–332.

Claessens, B. J. C., Eerde, W. V., & Rutte, C. G. (2007). A review of the time management literature. *Personnel Review*, *36* (2), 255–276.

Crawford, E. R., LePine, J. A., & Rich, B. L. (2010). Linking job demands and resources to employee engagement and burnout: A theoretical extension and meta-analytic test. *Journal of Applied Psychology*, *95*, 834–848.

Dalton, D.R., Aguinis, H., Dalton, C.M., Bosco, F.A., & Pierce, C.A. (2012). Revisiting the file drawer problem: An assessment of published and non-published correlations matrices. *Personnel Psychology*, *65*, 221–249.

Danna, K., & Griffin, R. (1999). Health and well-being in the workplace: A review and synthesis of the literature. *Journal of Management*, *25*, 357–384.

Day, A., Hartling, N., & Mackie, B. (2015). The Psychologically Healthy Workplace: Fostering Employee Well-Being & Healthy Businesses. In P. Perrewe & J. Meurs (Eds.) *Stress and Quality of Working Life* (pp. 199-217). Charlotte, NC: Information Age Publishing

Day, A. & Nielsen, K. (2016). What does our organization do to help our well-being? Creating Healthy Workplaces and Workers. In: *An introduction of work and organizational psychology*. N. Chmiel, F. Fraccaroli, & M. West Sussex: Wiley Blackwell.

Deci, E. L., & Ryan, R. M. (1985). The general causality orientations scale: Self-determination in personality. *Journal of Research in Personality*, *19*, 109–134.

Resources, well-being and performance

- Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands – resources model of burnout. *Journal of Applied Psychology* 86, 499–512.
- Doherty, B., Haugh, H., & Lyon, F. (2014). Social enterprises as hybrid organizations: A review and research agenda. *International Journal of Management Reviews*, 16 (4), 417–436.
- Fletcher, C., & Baldry, C. (1999). Multi-source feedback systems: a research perspective. In C. L. Cooper, & I. T. Robertson (Eds), *International review of industrial and organizational psychology* (Vol. 14 pp. 149-193). New York: John Wiley & Sons.
- Frese, M., & Zapf, D. (1988). Methodological issues in the study of work stress: objective vs. subjective measurement of work stress and the question of longitudinal studies. In C. L. Cooper, & R. Payne (Eds), *Causes, coping and consequences of stress at work* (pp. 375-411). New York: Wiley.
- Graen, G. B., & Uhl-Bien, M. 1995. Relationship-based approach to leadership: Development of leader member exchange (LMX) theory of leadership over 25 years: Applying multi-level multi-domain perspective. *Leadership Quarterly*, 6, 219–247.
- Grebner, S., Semmer, N., & Elfering, A. (2005). Working conditions and three types of well-being: A longitudinal study with self-report and rating data. *Journal of Occupational Health Psychology*, 10, 31–43.
- Hackman, R., & Oldham, G. (1976). Motivation through the design of Work: Test of a theory. *Organizational Behavior and Human Performance*, 16, 250–279.
- Halbesleben, J. R. B. (2010). A meta-analysis of work engagement: Relationships with burnout, demands, resources, and consequences. In A. B. Bakker & M. P. Leiter (Eds.), *Work engagement: A handbook of essential theory and research* (pp. 102–117). Hove, East Sussex: Psychology Press.

Resources, well-being and performance

Halbesleben, J. R. B., Neveu, J. P., Paustian-Underdahl, S. C., & Westman, M. (2014).

Getting to the "COR": Understanding the Role of Resources in Conservation of Resources Theory. *Journal of Management*, *40*, 1334-1364.

Hall, D. T., & Richter, J. (1988). Balancing work life and home life: What can organizations do to help? *Academy of Management Executive*, *3*, 213-223.

Häusser, J. A., Mojzisch, A., Nielsen, M., & Schulz-Hardt, S. (2010). Ten years on: A review of recent research on the Job Demand-Control(-Support) model and psychological well-being. *Work & Stress*, *24*, 1–35.

Hedges, L. V., & Olkin, I. (1985). *Statistical methods for meta-analysis*. Orlando, FL: Academic Press.

Higgins, J. P. T., Thompson, S. G., Deeks, J. J., & Altman, D. G. (2003). Measuring inconsistency in meta-analyses. *BMJ*, *327* (7414), 557–560.

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, *44*, 513–524.

Hunter, J. E., & Schmidt, F. L. (2004). *Methods of meta-analysis. Correcting error and bias in research findings* (2 ed.). Thousand Oaks, Ca: Sage.

Jiang, K., Lepak, D., & Baer, J. (2012). How does human resource management influence organizational outcomes? A meta-analytic investigation of mediating mechanisms. *Academy of Management Journal*, *55*, 1264–1294.

Judge, T. & Piccolo, R. (2004). Transformational and transactional leadership: A meta-analytic test of their relative validity. *Journal of Applied Psychology*, *89*, 755–768.

Kelloway, E. K., & Barling, J. (2010). Leadership development as an intervention in occupational health psychology. *Work & Stress*, *24*, 260-279.

Resources, well-being and performance

- Kinnunen, U., Feldt, T., Siltaloppi, M., & Sonnentag, S. (2011). Job demands–resources model in the context of recovery: Testing recovery experiences as mediators. *European Journal of Work and Organizational Psychology, 1*–28.
- Kompier, M. A. J. (2005). Assessing the psychosocial work environment: “subjective” versus “objective” measurement. *Scandinavian Journal of Work, Environment and Health, 31*, 405-408.
- Lindell, M. K., & Whitney, D. J. 2001. Accounting for common method variance in cross-sectional research designs. *Journal of Applied Psychology, 86*, 114–121.
- Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis* (Vol. 49). Thousand Oaks, Ca: Sage.
- Luthans F., & Youssef, C.M. (2004). Human, social, and now positive psychological capital management: Investing in people for competitive advantage, *Organizational Dynamics, 33*, 143-160.
- Martin, A., Sanderson, K., Cocker, F., 2009. Meta-analysis of the effects of health promotion intervention in the workplace on depression and anxiety symptoms. *Scandinavian Journal of Work, Environment and Health, 35*, 7–18.
- Mathieu, J. E., Maynard, M. T., Rapp, T., & Gilson, L. (2008). Team effectiveness 1997–2007: A review of recent advancements and a glimpse into the future. *Journal of Management, 34*, 410– 476.
- Maynard, M. T., Mathieu, J. E., Gilson, L. L., O’Boyle, E. H., & Cigularov, K. P. (2013). Drivers and outcomes of team psychological empowerment: A meta-analytic review and model test. *Organizational Psychology Review, 3*, 101–137.
- Michie, S., & Williams, S. (2003). Reducing work related ill-health and sickness absence: A systematic literature review. *Occupational and Environmental Medicine, 60*, 3–9.

## Resources, well-being and performance

- Moneta, G., Amabile, T., Schatzel, E., & Kramer, S. (2010). Multirater assessment of creative contributions to team projects in organizations. *European Journal of Work and Organizational Psychology, 19*, 150–176.
- Nielsen, K., & Munir, F. (2009). How do transformational leaders influence followers' affective well-being? Exploring the mediating role of self-efficacy. *Work & Stress, 23*, 4, 313-329.
- Nielsen, K., Randall, R., Holten, A.L., & Rial Gonzalez, E. (2010). Conducting organizational-level occupational health interventions: What works? *Work & Stress, 24*, 234-259.
- Ogbonnaya, C., Daniels, K., Connolly, S., & van Veldhoven, M. (2017). Integrated and isolated impact of high-performance work practices on employee health and well-being: A comparative study. *Journal of Occupational Health Psychology, 22*, 98-114.
- Paré, G., & Tremblay, M. (2007). The influence of high-involvement human resources practices, procedural justice, organizational commitment, and citizenship behaviours on information technology professionals' turnover intentions. *Group & Organization Management, 32*, 326–357.
- Parker, S., Wall, T. & Cordery J. (2001). Future work design and practice: Towards an elaborated model of job design. *Journal of Occupational and Organizational Psychology, 74*, 413-440.
- Peltokorpi, V., & Hasu, M. (2014). How participative safety matters more in team innovation as team size increases. *Journal of Business Psychology 29*, 37-45.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*, 879-903.

Resources, well-being and performance

- Podsakoff, P. M., MacKenzie, S. & Podsakoff, N.P. (2012), Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, *63*, 539–69.
- Richardson, K.M. & Rothstein, H.R. (2008). Effects of occupational stress management intervention programs: A meta-analysis. *Journal of Occupational Health Psychology*, *13*, 69–93.
- Schaufeli, W., & Taris, T.W. (2014). A critical review of the job demands-resources model: Implications for improving work and health. In G.F. Bauer and O. Hammig. *Bridging occupational, organizational and public health*, pp. 43-68. Dordrecht: Springer.
- Shalley, C., Gilson, L., & Blum, T. (2009). Interactive effects of growth need strength, work context, and job complexity on self-reported creative performance. *Academy of Management Journal*, *52* (3), 489–505.
- Shaugnessy, J. J., Zechmeister, E. B., & Zechmeister, J. S. (2006). *Research methods in psychology* (7th ed.). New York, NY: McGraw-Hill.
- Shipton, H., West, M., Parkes, C., Dawson, J., & Patterson, M. (2006). When promoting positive feelings pays: Aggregate job satisfaction, work design features, and innovation in manufacturing organizations. *European Journal of Work and Organizational Psychology*, *15*, 404–430.
- Skakon, J., Nielsen, K., Borg, V., & Guzman, J. (2010). The impact of leaders on employee stress and affective well-being: A systematic review of three decades of empirical research. *Work & Stress*, *24*, 107–139.
- Taris, T. W. (2006). Is there a relationship between burnout and objective performance? A critical review of 16 studies. *Work & Stress*, *20*, 316-334.

## Resources, well-being and performance

van De Voorde, K., Paauwe, J., & Van Veldhoven, M. (2012). Employee well-being and the HRM–organizational performance relationship: A review of quantitative studies.

*International Journal of Management Reviews*, *14*, 391–407.

van der Klink, J., Blonk, R., Schene, A., & van Dijk, F. 2001. The benefits of interventions for work-related stress. *American Journal of Public Health*, *91*, 270–276.

Wright, T. A., & Cropanzano, R. (2000). Psychological well-being and job satisfaction as predictors of job performance. *Journal of Occupational Health Psychology*, *5*, 84-94.

Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of Management Review*, *26*, 179-201.

Resources, well-being and performance

Table 1. Overall relationships between resources, well-being, and performance (Random effects model)

| <i>Outcome</i> | <i>K</i> | <i>N</i> | <i>Mean</i><br><i>r</i> | <i>95 %</i><br><i>CI</i> | <i>80% PI</i> | <i>Q<sub>within</sub></i> | <i>I<sup>2</sup></i> | <i>Tau</i> | <i>Tau<sup>2</sup></i> |
|----------------|----------|----------|-------------------------|--------------------------|---------------|---------------------------|----------------------|------------|------------------------|
| Well-being     | 91       | 30317    | .29                     | .23<br>- .34             | .06<br>- .51  | 2438.65***                | 96.31                | .27        | .07                    |
| Performance    | 92       | 29624    | .21                     | .17<br>- .25             | .04<br>- .37  | 1232.28***                | 92.62                | .19        | .04                    |

\*\*p<.001; \*p<.05; <sup>ns</sup> =Not significant.

*Note.* *K*= number of correlations; *N*= total sample size for all studies combined; *mean r*= average weighted correlation coefficient; *95% CI*= lower and upper limits of 95% confidence interval; *80% PI*= lower and upper limits of 80% prediction interval.

Resources, well-being and performance

Table 2. Findings from moderator analyses of point estimates for the correlations between resource levels and indicators of well-being (Random effect models).

| <i>Outcome</i> | <i>K</i> | <i>N</i> | <i>Mean</i> | <i>95 % CI</i> | <i>80% PI</i> | <i>Q<sub>within</sub></i> | <i>I<sup>2</sup></i> | <i>Tau</i> | <i>Tau<sup>2</sup></i> |
|----------------|----------|----------|-------------|----------------|---------------|---------------------------|----------------------|------------|------------------------|
| <i>r</i>       |          |          |             |                |               |                           |                      |            |                        |
| Individual     | 41       | 8504     | .24         | .16 - .33      | -.00          | 1092.73***                | 96.34                | .28        | .08                    |
|                |          |          |             |                |               |                           |                      |            |                        |
|                |          |          |             |                |               |                           |                      |            |                        |
| Group          | 18       | 6697     | .25         | .16 - .33      | .08           | 211.50***                 | 91.96                | .19        | .04                    |
|                |          |          |             |                |               |                           |                      |            |                        |
|                |          |          |             |                |               |                           |                      |            |                        |
| Leader         | 32       | 7507     | .27         | -.19           | .07           | 462.09***                 | 93.29                | .23        | .05                    |
|                |          |          |             |                |               |                           |                      |            |                        |
|                |          |          |             |                |               |                           |                      |            |                        |
| Organization   | 54       | 22669    | .31         | .24 - .38      | .08           | 1701.90***                | 96.87                | .27        | .08                    |
|                |          |          |             |                |               |                           |                      |            |                        |
|                |          |          |             |                |               |                           |                      |            |                        |

\*\*p<.001; \*p<.05; <sup>ns</sup>=Not significant

*Note.* *K*= number of correlations; *N*= total sample size for all studies combined; *mean r*= average weighted correlation coefficient; *95% CI*= lower and upper limits of 95% confidence interval; *80% PI*= lower and upper limits of 80% prediction interval.

Resources, well-being and performance

Table 3. Findings from moderator analyses of point estimates for the correlations between resource levels and indicators of performance (Random effect models).

| <i>Outcome</i> | <i>K</i> | <i>N</i> | <i>Mean r</i> | <i>95 % CI</i> | <i>80% PI</i> | <i>Q<sub>within</sub></i> | <i>I<sup>2</sup></i> | <i>Tau</i> | <i>Tau<sup>2</sup></i> |
|----------------|----------|----------|---------------|----------------|---------------|---------------------------|----------------------|------------|------------------------|
| Individual     | 42       | 8104     | .21           | .14 - .27      | .03 - .39     | 560.72***                 | 92.69                | .22        | .05                    |
| Group          | 17       | 5991     | .17           | .09 - .26      | .03 - .32     | 143.23***                 | 88.83                | .17        | .03                    |
| Leader         | 32       | 7619     | .22           | .17 - .27      | .11 - .33     | 156.23***                 | 80.16                | .13        | .02                    |
| Organization   | 57       | 22715    | .20           | .15 - .25      | .04 - .37     | 0.32***                   | 93.34                | .19        | .04                    |

\*\*p<.001; \*p<.05; <sup>ns</sup>=Not significant

*Note.* *K*= number of correlations; *N*= total sample size for all studies combined; *mean r*= average weighted correlation coefficient; *95% CI*= lower and upper limits of 95% confidence interval; *80% PI*= lower and upper limits of 80% prediction interval.

Resources, well-being and performance

Table 4. Findings from moderator analyses of point estimates for the correlations between resources and indicators of performance as differentiated by rating source (Random effect models).

| <i>Level</i>       | <i>K</i> | <i>N</i> | <i>Mean</i><br><i>r</i> | <i>95 % CI</i> | <i>80% PI</i> | <i>Q<sub>within</sub></i> | <i>I<sup>2</sup></i> | <i>Tau</i> | <i>Tau<sup>2</sup></i> |
|--------------------|----------|----------|-------------------------|----------------|---------------|---------------------------|----------------------|------------|------------------------|
| Self-report        | 26       | 25824    | .23                     | .16 - .30      | .07 - .31     | 501.03**                  | 95.01                | .19        | .04                    |
|                    |          |          |                         |                |               | *                         |                      |            |                        |
| Leader/third party | 43       | 23468    | .23                     | .16 - .30      | .02 - .44     | 585.58**                  | 92.93                | .25        | .06                    |
|                    |          |          |                         |                |               | *                         |                      |            |                        |
| Objective          | 7        | 3409     | .09                     | .03 - .15      | .09 - .09     | 3.03 <sup>ns</sup>        | .00                  | .00        | .00                    |

\*\*p<.001; \*p<.05; <sup>ns</sup>=Not significant

*Note.* *K*= number of correlations; *N*= total sample size for all studies combined; *mean r*= average weighted correlation coefficient; *95% CI*= lower and upper limits of 95% confidence interval; *80% PI*= lower and upper limits of 80% prediction interval.