# A Meta-Analysis on Employee Perceptions of HR Strength: Examining the Mediating versus Moderating Hypotheses

Timothy C. Bednall

Department of Management & Marketing, Swinburne University of Technology, Melbourne, Australia

Email: [tbednall@swin.edu.au](mailto:tbednall@swin.edu.au)

Karin Sanders

School of Management, The University of New South Wales

Email: [k.sanders@unsw.edu.au](mailto:k.sanders@unsw.edu.au)

Huadong Yang

University of Liverpool Management School

Email: [huadong.yang@liverpool.ac.uk](mailto:huadong.yang@liverpool.ac.uk)

Correspondence concerning this article should be addressed to Timothy C. Bednall. Email: [tbednall@swin.edu.au](mailto:tbednall@swin.edu.au).

**Author Biographies**

**Timothy C. Bednall** is a senior lecturer in the Department of Management & Marketing, Swinburne University of Technology, Melbourne, Australia. Timothy has published papers on various management journals, such as Academy of Management Learning and Education, Human Resource Management. His current research interests include employee learning and innovative behavior.

**Karin Sanders** is a Professor of Human Resource Management at the University of New South Wales. Her research focuses on the Human Resource (HR) process approach, in particular the impact of employees’ perceptions, understanding and attributions of HR on their attitudes and behaviours, such as their informal learning activities. Karin is Editor for the Special Issues International Journal of HRM, and Associate Editor for Human Resource Management, Human Resource Management Review, and Human Resource Management Journal.

**Huadong Yang** is a senior lecturer in Organisational Behaviour and HRM at the University of Liverpool Management School (ULMS). Before joining the ULMS, he taught at the University of Twente in the Netherlands and Birkbeck, University of London.

# A Meta-Analysis on Employee Perceptions of HR Strength: Examining the Mediating versus Moderating Hypotheses[[1]](#footnote-2)

## Abstract

HR strength research has substantially informed an understanding of the relationship between HR practices and employee-level outcomes. However, a key unresolved issue is whether employee perceptions of HR strength act as a mediator or a moderator in the relationship between HR practices and these outcomes. A meta-analysis of 42 studies (comprising 65 samples and 29,444 unique participants) was conducted to address this issue. Results support the mediating hypothesis for all five employee outcomes: employee reactions, proactive behavior, burnout, performance, and perceived organizational effectiveness. Conversely, the moderating hypothesis was only supported for employee performance. In addition, we examined five study characteristics (the operationalization of perceived HR strength, research study design, industry, sampling strategy, and publication status) as moderators. Using this analysis, we test the robustness of our main results and identify sources of heterogeneity in the results across studies. The results show that the mediating hypothesis still holds under different study designs and contexts. Theoretical and practical implications of these results are discussed.

***Keywords:*** Perceived HR strength, signaling theory, attribution theory, covariation model, mediator, moderator, meta-analysis.

# A Meta-Analysis on Employee Perceptions of HR Strength: Examining the Mediating versus Moderating Hypotheses

At the end of the previous century, human resource management (HRM) research mainly focused on the relationship between HR practices and the performance of employees and firms. This relationship has been explained through at least three theoretical orientations. The strategic HRM perspective adopts the resource-based view of the firm, hypothesizing that HR practices support firm performance by attracting, developing and retaining top-performing employees (Wright & McMahan, 2011). The behavioral perspective proposes that HR practices influence employees’ performance by enhancing their ability, motivation and opportunity to work effectively (Jiang, Lepak, Hu, & Baer, 2012). And, the social exchange perspective suggests that employees benefit from HR practices intended to support employee commitment and/or performance, motivating them to reciprocate the favors of their organization through increased satisfaction, effort and participation in discretionary activities (Cropanzano & Mitchell, 2005; Sun, Aryee, & Law, 2007).

Building on these insights, Bowen and Ostroff (2004) developed a process theory to explain *how* employees come to understand HRM practices and *how* their interpretation influences their attitude, behaviors, and performance. These authors propose that a “strong” HRM system sends out unambiguous signals about what an organization expects and values, which will be interpreted similarly by employees. Based on the covariation principle of Kelley's (1967, 1973) attribution theory, a “strong” system is characterized by *distinctiveness* (i.e., whether HR practices are visible, understandable, relevant, and legitimate), *consistency* (i.e., whether HR practices are similar across time and modalities) and *consensus* (i.e., whether HR practices are fair and agreed-upon by key decision makers). The HR strength framework has inspired many empirical studies (see for reviews Hewett, Shantz, Mundy, & Alfes, 2018; Wang, Kim, Rafferty & Sanders, 2020), with most studying HR strength as individual employee perceptions (hereafter referred to as perceived HR strength). This representation is different from Bowen and Ostroff’s (2004) original conceptualization of HR strength as an organizational-level framework. However, Ostroff and Bowen (2016) acknowledge the value of perceived HR strength, referring to it as a “meaningful construct” (p. 198).

Despite the prevalence of this research, several important questions remain unresolved. One of the most important issues concerns whether perceived HR strength acts as a mediator or a moderator of the relationship between HR practices and employee outcomes. This distinction is important because each type of relationship implies different underlying theories. The mediational hypothesis is aligned with the message-based persuasion literature (Chaiken, Wood, & Eagly, 1996; McGuire, 1972) and signaling theory (Connelly, Certo, Ireland, & Reutzel, 2011; Ehrnrooth & Björkman, 2012). It implies that HR practices produce signals about what is expected and valued, which are reflected in reports of perceived HR strength and subsequently influence employee outcomes. The moderating hypothesis is grounded in the covariation principle of Kelley’s (1967, 1973) attribution theory. It implies that the relationship between HR practices and employee outcomes will be stronger if employees perceive an information pattern of high distinctiveness, high consistency and high consensus regarding the purpose of HR practices (Sanders & Yang, 2016). Although the signaling and attribution explanations are not mutually exclusive, resolving this debate will clarify the mechanism(s) by which HR practices produce beneficial outcomes. Theoretically, answering this question will help researchers understand the nature of perceived HR strength as signals, as informational patterns, as both, or as neither. From a practical perspective, such insights can help HR professionals and line managers improve employee outcomes, such as by improving communication regarding the availability and purpose of HR practices.

To address this question, we undertake the first meta-analysis on perceived HR strength. Our study contributes to research on HR strength in multiple ways. First, we provide empirical evidence regarding the theoretical debate regarding the role of perceived HR strength as a potential mediator or moderator in the relationship between HR practices and employee outcomes. Second, our meta-analysis provides a comprehensive summary of all available research on perceived HR strength to date, and it is broader and more systematic than previous reviews (e.g., Hewett et al., 2018; Ostroff & Bowen, 2016; Wang, et al., 2019). We examine five employee outcomes—including employee reactions, proactive behavior, burnout, performance, and perceptions of organizational effectiveness—to provide a broad perspective on the (mediating versus moderating) effects of perceived HR strength. We chose these measures as they were the most frequently studied outcomes within the empirical studies of HR strength, thereby maximizing our coverage of the literature. Moreover, the set of measures represent both employee performance and wellbeing, thereby encompassing the potential mutual gains of HR (Van De Voorde et al., 2012). Finally, our meta-analysis investigates five study characteristics—including the type of perceived HR strength measure, the use of robust (versus cross-sectional) research designs, industry, sample type, and publication status—to determine the extent to which the findings are consistent across different study designs and contexts. Based on the results of this meta-analysis, we make recommendations for directions regarding future perceived HR strength research.

In the following sections, we elaborate on our hypotheses regarding the mediating versus moderating effects of perceived HR strength with respect to the relationship between HR practices and employee outcomes. After this, we present the method and results of our meta-analysis and discuss the theoretical and practical implications of our findings.

## Do Employee Perceptions of HR Strength Act as a Mediator or as a Moderator?

Over the last 15 years, a consensus among HR scholars has emerged that a focus mainly on HR practices is insufficient for understanding how they influence employee outcomes. Research has turned to understanding the *process* by which these practices are understood and acted upon by employees (Bowen & Ostroff, 2004; Ostroff & Bowen, 2016; Sanders et al., 2014). This line of research has instead investigated how HR practices are communicated, and how features of an HR system are perceived and understood by individual employees. Despite many studies having acknowledged the importance of employee perceptions of HR strength, there is still debate regarding its role in the linkage between HR practices and employee outcomes.

On the one hand, perceived HR strength could be viewed as a mediator in the relationship between HR practices and employee outcomes. According to signaling theory (Connelly et al., 2011; Ehrnrooth & Björkman, 2012), there is frequently an asymmetry between the information possessed by senders (in this case, management) and receivers (in this case, employees). This asymmetry can be reduced through effective communication, which can be supported through the quality of the signals and the reliability and consistency of the sender (Spence, 2002). In the case of HR, practices can be viewed as signals sent out by management to employees to communicate the organization’s values and expectations. Interpreted this way, perceived HR strength therefore reflects the quality of these signals regarding the intentions and expectations of management.

Signaling theory has been widely used across management research. For example, in recruitment research, the emphasis of signaling theory is typically placed on the receiver’s side, while in strategic management research (Bergh et al., 2014; Connelly et al., 2011), the emphasis has been on the credibility of the signaler and quality of the signals. Research has considered the qualities of effective signals, with clarity, observability, frequency and consistency often recognized as elements of signal strength (Connelly et al., 2011; see also Guest, Sanders, Rodrigues, & Oliveira, 2020). These characteristics considerably overlap with the distinctiveness, consistency and consensus elements of HR strength (Bowen & Ostroff, 2004; Kelley, 1973), which are supposed to enhance the effectiveness of the signal.

Drawing on signaling theory to understand employee HR attributions, Van de Voorde and Beijer (2015; see also Guest et al., 2020; Sanders, Yang, & Li, 2019) argue that when HR practices are complementary and mutually reinforcing, they send out signals that are distinctive, consistent and consensual. Although these three studies did not include employee perceptions of HR strength, we can build on their line of reasoning to explain the relationship between HR practices and perceived HR strength. These authors argue that when an organization has implemented more HR practices, distinctiveness will be higher due to employees’ greater exposure to HRM. In this case, HRM will be more visible, sending out a stronger signal and affording employees greater opportunities for sense-making regarding the purpose of the HRM system. Second, when the coverage of HR practices is high, employees are likely to be exposed to more practices within the larger HR system. This exposure enables employees to perceive a consistent pattern across multiple practices regarding their intended purpose. Conversely, employees are likely to be exposed to fewer practices in a low coverage situation, making it difficult to infer consistent signals. Finally, it can be expected that exposure of more HR practices leads to greater agreement among employees about the purpose of HRM (consensus) (Guest et al, in press), as more employees receive the same signals. Moreover, as HR practices require multiple stakeholders to design and implement, they arguably signal consensus among key HR policymakers and management.

Strong signals (i.e., as reflected by perceived HR strength) are thought to have positive effects on employee outcomes. First, perceived HR strength is thought to reflect a better awareness of the rationale for HR practices, leading to greater understanding, acceptance and satisfaction (Hauff et al., 2017). If employees perceive HR practices as intended to benefit and support them, they are more likely to reciprocate by holding positive attitudes towards the organization and work harder. Second, perceived HR strength is thought to reduce uncertainty about the values and expectations of the organization (Alfes et al., 2019), thereby giving clearer direction about the types of in-role and proactive behaviors that contribute to organizational objectives. With greater certainty and more predictable outcomes, employees are more likely to engage in such valued behaviors and improve their in-role performance. Third, perceived HR strength is likely to contribute to perceptions of procedural and distributive fairness (Frenkel, Li, et al., 2012). A fair system is likely to guide the implementation of (equitable) employee workloads and provide them with greater decision-making power, thereby reducing employee burnout.

In summary, we expect that when organizations implement HR practices, they clearly signal the organization’s intentions to their employees (Alfes et al., 2019). Employees are consequently able to make better sense of their environment. This line of reasoning suggests that employee perceptions of HR strength mediate the relationship between HR practices and employee outcomes. Thus, we formulate our first hypothesis as follows:

*Hypothesis 1. Perceived HR strength mediates the relationship between HR practices and employee outcomes, including reactions (H1a), proactive behavior (H1b), burnout (H1c), performance (H1d), and perceived organizational effectiveness (H1e).*

In contrast to the mediating hypothesis, other researchers have proposed that perceived HR strength moderates the relationship between HR practices and employee outcomes (Bednall et al., 2014; Bednall & Sanders, 2017; Li et al, 2011; Sanders & Yang, 2016). In essence, the moderating hypothesis proposes that HR strength creates a strong organizational climate in which the functions of HR practices are enhanced. At least three rationales have been offered in support of this hypothesis. The first explanation is that perceived HR strength reflects the awareness of employees about the availability and intended purpose of each HR practice (Bednall & Sanders, 2017). Thus, employees are more likely to take advantage of practices if they are well communicated—such as opportunities for training, flexible work, or paternal leave arrangements—thereby enabling more people to benefit from them. The second explanation is that perceived HR strength reflects how effectively HR practices work together to achieve a consistent purpose (Bednall et al., 2014). For instance, Bednall et al. (2014) suggest that employees may be more willing to participate in performance appraisal processes if they are followed up with training and other career development opportunities. More generally, they argue that a tightly integrated (as opposed to atomized) set of HR practices is more likely to be embraced by employees if they understand their common purpose. In addition, they suggest that mutually reinforcing practices (e.g., performance appraisal and follow-up training) are themselves likely to produce a synergistic benefit in achieving a range of desirable employee outcomes.

The third explanation is that perceived HR strength reflects clarity regarding managerial intentions for the practices, thereby enabling employees and managers to implement them more effectively. This hypothesis originates from empirical studies that investigated the effects of the three meta-features (distinctiveness, consistency and consensus) (Li et al., 2011; Sanders et al., 2008). According to the covariation principle of Kelley’s (1967, 1972) attribution theory, if all three features are present, then an observer will attribute an event to a stimulus or entity. Conversely, observers will attribute an event to a person with a low/high/low combination of distinctiveness, consistency, and consensus, and to a situation with a low/low/high combination. In the context of HRM, Sanders and Yang (2016) argue that ‘*management*’ is the relevant entity. If employees attribute HR practices to management, they are more likely to embrace (or at least comply with) HR practices and understand them as intended by management. Conversely, when distinctiveness, consistency and consensus of the HR practices are low, employees’ understanding of what management intends and expects is unclear, and HR practices will be less effective.

In summary, these explanations propose that perceived HR strength works by increasing employees’ awareness and understanding of HR practices. Based on the above reasoning, we formulate our second hypothesis as follows:

*Hypothesis 2. Perceived HR strength moderates the relationships between HR practices and employee outcomes, including reactions (H1a), proactive behavior (H1b), burnout (H1c), performance (H1d), and perceived organizational effectiveness (H1e), such that these relationships are stronger when employee perceptions of HR strength are high.*

# Method

## Literature Search and Inclusion Criteria

We adopted a multimethod approach to identify relevant literature for inclusion in the meta-analysis. First, we conducted a title keyword search of online databases, including *PsycINFO*, *Scopus, Web of Science, Science Direct,* and *ABI-Inform / ProQuest* using a Boolean search string. The search string included two blocks: (“HR” OR “HRM” OR “human resource”) AND (“strength” OR “system strength” OR “process”). Second, we conducted a cited reference (forward) search on key papers on HR strength, including theory papers and review articles (Bowen & Ostroff, 2004; Ostroff & Bowen, 2016) and measurement papers presenting new HR strength scales (Coelho et al., 2015; Cunha & Cunha, 2009; Delmotte et al., 2012; Hauff et al., 2017; Pereira & Gomes, 2012). Third, we undertook a manual search of leading journals in management and human resource management, including *the* *Academy of Management Journal, Human Resource Management, Human Resource Management Journal, the International Journal of Human Resource Management, the Journal of Applied Psychology, the Journal of Management, the Journal of Management Studies, the Journal of Organizational Behavior, Personnel Psychology.* Fourth, we acquired unpublished “grey” literature by contacting authors of previously published studies on HR strength, searching the *ProQuest Dissertations and Abstracts* database for unpublished theses, searching through the conference proceedings from the Academy of Management (AOM) Annual Meeting from 2004-2018, and disseminating a call for papers via the AOM HR Division listserv and the HRMProcess Google Group. Our search yielded a total of 143 relevant journal articles, book chapters, conference papers and theses for possible inclusion.

Following the collection of research literature, we applied the following inclusion criteria. First, the study had to consist of employees and/or managers who had provided ratings of HR strength (perceived HR strength). We included all individual level operationalizations of HR strength, although as we later explain, we used moderator analysis to determine whether the choice of scale influences the results. We excluded studies that only investigated HR strength at the unit or organizational level (e.g., Cunha & Cunha, 2009; Katou, Budhwar, & Patel, 2014). Second, the study had to include at least one hypothesized employee-rated outcome of HR strength. Third, the study had to provide either a correlation table or enough information to compute Pearson’s *r* correlations among the measures. If correlations were not provided, we requested them from the authors. We excluded qualitative studies (e.g., Baluch, 2017; Stantona, Young, Bartram, & Leggat, 2010), theory papers and reviews (e.g., Hewett et al., 2018; Ostroff & Bowen, 2016).

After applying these criteria, our analysis consisted of 42 research papers, including 26 peer-reviewed journal articles, seven working papers, six dissertations and three conference papers. The studies were drawn from Europe (42.9%, including the United Kingdom, the Netherlands, Spain, Belgium, Sweden, Finland, Greece, Germany, Portugal, and Romania), Asia (33.3%, including China, Indonesia, Malaysia, Pakistan, South Korea and Vietnam), Australia (7.1%), North America (4.8%), the Middle East (4.8%); and 7.1% were drawn from multiple countries. A full list of studies is presented in the Supplementary Materials.

Following this procedure, we coded each study’s empirical findings. To avoid duplication, we coded findings only a single time if they had been reported across multiple publications; for instance, we included Delmotte et al. (2012) but not de Winne, Delmotte, Gilbert, and Sels (2013). If a paper reported multiple studies, we included each study as an independent sample. For studies where we were provided with direct access to the data, we estimated a separate correlation matrix for each organization in the dataset if the number of respondents was 20 or greater. If there were fewer than 20 respondents, we included them in a mixed sample consisting of multiple organizations from the same study. If the HR practices × perceived HR strength interaction was not available in the original study, we requested it from the authors. Across all included studies, there was a total of 65 independent samples consisting of 29,444 unique participants.

## Coding and Analysis Procedure

We coded each sample into a spreadsheet, including the sample characteristics (e.g., sample size, country of origin) and the study findings. We used Pearson’s *r* correlations as the effect size measure, as they are widely available and scale free. As the original studies sometimes used inconsistent variable names—for instance, HR strength has variously been referred to as “HRM system strength” (e.g., Delmotte et al., 2012), “HRM Process” (e.g., Katou, 2017)—we developed a dictionary of terms to ensure each variable was labelled consistently. The dictionary was reviewed by all authors of the paper, and disagreements about the labelling of variables were resolved through consensus. We also incorporated commonly used control variables into the dataset, including age, gender, hours worked per week, and tenure.

We next determined how each variable should be represented within the meta-analysis. To facilitate this process, we developed definitions of each major variable in our analysis (i.e., HR strength, HR practices and employee outcomes), which are shown in Table 1. We used each definition to determine how specific measures reported in studies should be classified. For example, we classified instances of “emotional exhaustion” and “fatigue” as “burnout”. If studies reported multiple measures of the same construct (e.g., distinctiveness, consistency, and consensus as separate variables), we combined them into a single variable (e.g., HR strength) using Schmidt and Hunter's (2015) composite correlation formula. Only 8 studies out of the 42 reported distinctiveness, consistency and consensus separately; thus, we examined HR strength as a broader construct. This process was reviewed by all authors and disagreement was resolved through discussion. If a study measured a variable over multiple waves (e.g., Bednall & Sanders, 2017), we included the HR practices and perceived HR strength variables from the earlier wave and the outcome variables from the subsequent wave.

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Insert Table 1 about here

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In strategic HRM, HR practices have often been studied together as *bundles of HR practices*—a set of separate but interrelated and internally consistent HR practices—that were hypothesized to collectively enhance employee and organizational performance. These bundles have been variously referred to as high performance work systems (Appelbaum, Bailey, Berg, Kalleberg, & Bailey, 2000), high-commitment HRM (Collins & Smith, 2006; Walton, 1985), high-performance HR practices (Sun et al., 2007), and high-performance work practices (Combs et al., 2006). In this study we treat these bundles interchangeably, as they typically aim at enhancing desired behaviors and employee performance. Moreover, they typically comprise similar practices including employment security, selective recruiting, extensive training, and employee participation (Boon et al., 2019).

To undertake the meta-analysis, we used one-stage meta-analytic structural equation modeling (OSMASEM; Jak & Cheung, 2019) as implemented in the *metaSEM* package version 1.2.5 (Cheung, 2015) for *R* version 4.0.2 (R Core Team, 2020). Compared to traditional meta-analyses that simply evaluate bivariate correlations, OSMASEM fits a hypothesized structural model directly to a set of observed correlation matrices. In contrast to previous approaches to meta-analytic structural equation modeling approaches (Becker, 2009; Viswesvaran & Ones, 1995), OSMASEM allows individual studies to be weighted according to sample size. A further advantage is OSMASEM applies a random-effects model, thereby accounting for within-study sampling error and between-study variability in effect sizes. Finally, the random effects model enables study characteristics to be incorporated into the analysis as between-study moderators.

# Results

The aggregated correlations between each of the variables were estimated using the *metafor* package for *R* (Viechtbauer, 2010). Table 2 depicts the correlations among the focal variables, and it presents the number of samples (*k*) associated with each cell, the total sample size (*N*), the heterogeneity statistic (*Q*), the weighted average effect size (*r*), and the lower and upper limits of 99% confidence intervals (CI). Additional information is presented in the Supplementary Materials, including a full correlation table that includes the control variables, and forest plots of each bivariate relationship.

As can be seen in this table, HR bundles and perceived HR strength were correlated. Bundles of HR practices and employee perceptions of HR strength were positively related to employee outcomes, including reactions, proactive behavior, and perceived organizational effectiveness, with bundles of HR practices generally showing stronger relations. Both bundles of HR practices and perceived HR strength also showed a smaller albeit still significant relationship with employee performance, and a negative relationship with employee burnout. The control variables (age, gender, tenure, and hours of work) were not significantly associated with bundles of HR practices, perceived HR strength or their interaction. Thus, we opted not to include these control variables in the hypothesized model, as the lack of a significant relationship indicates that they cannot confound the relationships between the antecedent and outcome variables.

## Tests of Hypotheses

Using the OSMASEM approach, we test a series of path analyses using each outcome as the dependent variable. In the first step, we test the mediating hypothesis, in which each outcome is regressed on bundles of HR practices and perceived HR strength. In the second step, we test the moderating hypothesis, in which we add the bundles of HR practices × perceived HR strength interaction to the model and evaluate its effect on each outcome. The results of the meta-analytic path model are presented in Table 3.

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Insert Tables 2-3 about here

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In support of H1 (mediating effect of perceived HR strength), we found that bundles of HR practices were positively related to perceived HR strength (*β* = .51, *p* < .001) and perceived HR strength was positively related to employee reactions, proactive behavior, employee performance and organizational effectiveness, and negatively related to burnout. As indicated by 95% likelihood-based confidence intervals (CI) in Model 1, the indirect paths from HR bundles via perceived HR strength were significant for all outcomes, including employee reactions (*β* = .14, CI: [0.10, 0.19]), employee proactive behavior (*β =*.08, CI: [0.03, 0.13]), employee performance (*β =*.06, CI: [0.02, 0.11]), burnout (*β = -*.10, CI: [-0.17, -0.03]) and perceived organizational effectiveness (*β* = .12, CI: [0.02, 0.23]). Collectively, these results provide support for H1a-e.

In the next step, we tested the perceived HR-strength-as-moderator hypothesis (H2). Our model provides marginal support for H2. First, our findings reveal a non-significant relationship between bundles of HR practices and employee reactions and employee behavior, which not supported H2a and H2b. Second, we found significant interactive effects for burnout, employee performance and perceptions of organizational effectiveness, which are illustrated in Figure 1. As shown in Panel A, the positive relationship between bundles of HR practices and employee performance increased when the perceived HR strength is strong, which supports the H2d. However, as depicted in Panels B and C, the relationships between bundles of HR practices on one hand and burnout and perceived organizational effectiveness on the other are weaker under the condition of high perceived HR strength, which are opposite to H2c and H2e. Overall, our findings only supported H2d (employee performance) and do not support or rejected all other moderating hypotheses.

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Insert Figure 1 about here

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## Between-Study Moderator Analyses of Study Characteristics

To better understand the sources of heterogeneity in the data and assess the robustness of the results, we conducted a series of between-study moderator analyses based on five study characteristics. The factors we examined included the type of perceived HR strength scale used in each study, the use of cross-sectional (versus robust) study designs, the industry, the type of industry investigated, and whether the study was published or unpublished. We focused on employee reactions and employee proactive behavior as outcomes, as we lacked enough studies to conduct the between-study moderator analyses with the other outcomes. Although the HR-strength-as-moderator hypothesis was not supported, we examine the (within-study) moderation effects in the following comparison to determine whether these effects are different across study settings.

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We grouped the samples according to each characteristic, and the comparisons between groups are presented in Table 4. The Table also presents the number of samples (*k*) within each group. We coded each comparison using dummy variables, and we represented the group with the largest number of associated samples as the baseline condition (i.e., with all dummy variables equal to zero). For the baseline condition (highlighted in bold), we present the standardized path coefficient. The significance test indicates whether this effect is significantly different from zero. For the comparison conditions, we present the positive (+) and negative (-) differences in effect size compared to the baseline. (Thus, a coefficient of zero means that the overall effect size associated with the comparison condition is unchanged from the baseline.) Significance tests for the comparison conditions indicate whether the effect is significantly different to the baseline. For the paths associated with the mediation model, if a comparison condition is non-significant, it suggests the indirect effect still holds.

For the measurement scale comparisons, the most frequently used scale was Delmotte et al. (2012), followed by Frenkel et al. (2012), and Hauff et al. (2017). The remaining samples used a self-developed scale used in a single study, the Coelho et al. (2015) scale, or the level of agreement between employees and/or line managers (Guest & Conway, 2011). As all of these approaches were infrequent, we grouped them into a single “Other” category. We found that the Frenkel and Hauff scales produced the strongest associations for the first-stage relationship between bundles of HR practices and perceived HR strength. The Frenkel scale also produced stronger associations between perceived HR strength and employee reactions for both the mediating and moderating relationships. This scale also revealed a stronger effect for the second-stage mediating relationship between HR strength and employee behavior. Scales in the “Other” category did not differ significantly from the Delmotte scale.

While the Frenkel et al. (2012) and Hauff et al. (2017) scales produced generally larger effect sizes, studies using these scales all employed cross-sectional designs. To investigate the extent the research study design influenced the results, we compared the cross-sectional studies with those that employed more robust research designs. These included studies that employed a lagged design and studies that had used multi-source measurement to measure perceived HR strength and the study outcomes. (The multi-source studies included four studies that had measured perceived HR strength and outcomes using different respondents, and another study that had experimentally manipulated HR strength.) For the lagged studies, we recorded the time that had elapsed between the measurement of perceived HR strength and the later measurement of outcomes. The interval ranged from three weeks (Farndale et al., 2020) to a year (Bednall & Sanders, 2017).

Using this approach, we observed that studies using robust designs reported smaller effect sizes. For studies that used multi-source designs, we found that the effect of perceived HR strength on employee behavior was significantly weaker than in cross-sectional studies. For studies employing a lagged design, we found that the relationship between perceived HR strength and employee behavior significantly weakened over time, although this reduction was relatively small. The other comparisons were small and non-significant.

We also compared different industries to assess differences in results. Combs et al. (2006) hypothesized that manufacturing businesses would benefit more from HPWPs, due to a greater need for regulations concerning dangerous equipment, the need for in-house development of technical skills, and the need to establish quality standards for product design. Following the meta-analysis of Rabl et al. (2014), we classified industries as “Service” if their primary business was service delivery, and “Manufacturing” if their primary business was production, or “Mixed” if the organization had significant involvement in both. Although small differences between industries were observed, none of the comparisons achieved significance.

Following Rabl et al. (2014), we also distinguished between studies that had sampled from: (1) multiple organizations (used as the baseline condition), (2) single organizations situated in a single location (establishments), and (3) single organizations located across multiple sites (firms). We found that the interactive effects of bundles of HR practices and perceived HR strength were significantly stronger in establishments and firms. Finally, we compared published studies with (unpublished) grey literature. This comparison showed no significant differences between the two sets of studies.

# Discussion

In this meta-analysis, we sought to provide a near-exhaustive coverage of all empirical studies to date that have investigated linkages between bundles of HR practices, employee perceptions of HR strength and a range of employee outcomes. Our main objective was to investigate whether the effects of perceptions of HR strength should be interpreted in accordance with the signaling perspective (Connelly et al, 2011; i.e., the mediation hypothesis) or with the covariation principle of Kelley’s (1967, 1973) attribution theory (i.e., the moderation hypothesis). In addition, we also examined the extent to which study characteristics influenced the robustness of the findings. To address these questions, we adopted a systematic approach to gathering all available research on perceptions of HR strength and applied one-stage meta-analytic structural equation modelling in order to perform a robust test of our hypotheses (Cheung, 2015).

Overall, our findings consistently support the mediation hypothesis, suggesting that perceived HR strength transfers the effects of HR practices on to the five employee outcomes. In contrast, the alternative moderation hypothesis, which proposed that perceived HR strength moderates the relationship between HR practices and the employee outcomes, received limited support. The hypothesized moderating effect was found only for employee performance but not for the remaining four outcomes. In addition, even when accounting for the study characteristics (the operationalization of perceived HR strength, research study design, industry, sampling strategy, and publication status), we are still able to detect a consistent pattern on the mediation effect of perceived HR strength and an inconsistent pattern regarding the moderation effect of perceived HR strength. In the discussion below, we further elaborate on the theoretical and practical implications of our study, point out some limitations and put forward recommendations on future perceived HR strength studies.

## Theoretical Implications

The consistent findings regarding the mediating effect of perceptions of HR strength provide support for the HR process approach (Bowen & Ostroff, 2004) and the message-based perspective regarding perceived HR strength (Ostroff & Bowen, 2016). Different from the human capital perspective (Wright & McMahan, 2011), the behavioral perspective (Jiang et al., 2012) and the social exchange perspective (Shaw, Dineen, Fang & Vellella, 2009), the perceived HR strength perspective argues that the synergetic effect of bundles of HR practices can be understood by means of the meta-features of distinctiveness, consistency and consensus, which are the key elements of HR strength (Bowen & Ostroff, 2004). It is this additive effect of these meta-features that signals the integration and mutual reinforcement of HR practices, which in turn leads to employee outcomes. In our meta-analysis, this additive effect is demonstrated through the method used to calculate HR strength in the included studies. Most studies combined the three meta-features to indicate the overall strength of HR bundles by summing or averaging them. In other words, the accumulation of these three meta-features in the mediation hypothesis is assumed to reflect perceived HR strength.

The findings from the mediation hypotheses pose at least three theoretical implications. First, our findings in the first part of the mediation link indicate that there is some shared variance between bundles of HR practices and perceived HR strength. The shared variance suggests that bundles of HR practices can signal the characteristics of distinctiveness, consistency, and consensus. However, bundles of HR practices do not entirely account for HR strength; the unique variance associated with each factor supports the overarching argument of HR process approach: bundles of HR practices differ not only in terms of their content but also in how they are presented and communicated (Patel et al., 2021). Second, these meta-features are meaningful in signaling the intended purpose of HR practices bundles, which in turn influence employee outcomes. Put differently, our study suggests that perceived HR strength reflects the extent to which HR practices work together to achieve a clear objective. Third, a closer examination of the mediation tests across the five employee outcomes suggests that employee reactions (including employee engagement, organizational commitment, organizational identification, intention to leave, job satisfaction, perceived organizational support, self-efficacy and coping with change) (*β* = .14) is the most strongly affected outcome. This finding suggests that perceived HR strength predominantly influences the extent to which employees regard their work situation positively or negatively, with its effects on reported behavior, burnout and performance being slightly weaker.

Overall, the mediation effect of perceived HR strength reveals the importance of signaling when communicating bundles of HR practices to employees. When the HR bundles are distinctive, consistent and consensual, they will facilitate employees’ understanding of the synergic and reinforcing characteristics. In this meta-analysis, the three meta-features are derived from Kelly’s covariation model (1967; 1973). Future research should consider other theoretical models to better understand how the synergic characteristics inside HR practices create signals. For instance, signaling theory (Connelly, et al, 2011; Ehrnrooth & Björkman, 2012) may be a particularly useful framework. Signaling theory not only pays attention to the quality of the signal itself by tapping into the characteristics of clarity, observability, frequency and consistency, but it also highlights additional factors that are likely to be important for HR-related communication, such as the characteristics of information senders and receivers, and environmental distortion of messages.

Conversely, the findings regarding the moderation hypotheses are quite inconsistent. Perceived HR strength moderates the relationship between HR practice bundles and employee performance in the expected direction. In contrast, our findings show a non-significant moderating effect of perceived HR strength on the relationship between HR bundles and employee reactions. Contrary to our expectations, we also observed a reversed moderating effect of perceived HR strength on the relationship between HR bundles and employee burnout and organizational effectiveness.

These inconsistent findings related to the moderating effects of perceived HR strength may be related to the perceived goal(s) of the HR practices in each study. In this meta-analysis, the sets of HR practices were variously labelled “high performance” and “high commitment” by the authors of each research paper. However, inspection of the items used to measure the practices revealed that enhancing employee performance appeared to be a goal of even nominally commitment-focused practices. For instance, the high-commitment HRM scale used by Sanders et al. (2008) and Bednall and Sanders (2017) referred to employee training as a key HR activity, and the “high-commitment” scale used in Farndale et al. (2020) was adapted from the high-performance work systems scale of Sun et al. (2007). As improved employee performance appears to have been an explicit goal across almost all of HR practice bundles studied in the meta-analysis, it follows that HR strength enhances the ability of bundles to achieve this espoused goal. Accordingly, if other bundles of HR practices also conveyed explicit goals (e.g., increased well-being, innovation, or service), we argue that HR strength will be more likely to moderate the relationship between HR practices and these outcomes. Thus, we encourage future research to examine the espoused goal (or multiple goals) of HR practices more closely when examining the moderating effects of HR strength on different outcomes.

Moreover, the inconsistent moderation effects may also be related to the “unanimous” treatment of the three meta-features in the included studies. Almost all of the studies took an additive approach, aggregating the sub-dimensions of distinctiveness, consistency and consensus to indicate perceived HR strength. Only one study (Sanders & Yang, 2016) followed Kelley’s covariation principle (1973) and used the different combinations (information patterns) of the meta-features to indicate different attributions of HR strength. Thus, we were unable to study the investigate the effects of the other information patterns. In reflection, this treatment appears to contradict the covariation principle of Kelley’s (1967; 1973) attribution theory. Kelley (1973) argued that each of the three meta-features contains unique informational cues and the combinations of these three meta-features form an informational pattern that leads individuals (in our case, referring to employees) to attribute others’ behavior (in this case, bundles of HR practice executed by organization) to a person, stimulus, or situation. For example, the combination of high distinctiveness, consistency and consensus leads employees to attribute HR practices to the objectives of management. In contrast, the combination of high distinctiveness, low consistency and low consensus leads employee to attribute HR practices to attribute HR practices to special circumstances (e.g., external regulation) (Sanders & Yang, 2016). For future studies, we encourage researchers to report each meta-feature separately. Moreover, following Bowen and Ostroff (2004) and Bos‐Nehles, Conway and Fox (2020), we urge researchers to investigate alternate methods for calculating perceived HR strength besides the additive approach, such as the compensatory approach (i.e., interpreting the factors as counteractive) or the configural approach (i.e., by distinguishing between different profiles of the features).

## Limitations and Future Research Directions

All meta-analyses, including this one, are limited by the number and quality of the primary studies within its coverage. Despite the considerable influence of the (perceived) HR strength construct, including the large numbers of citations of Bowen and Ostroff (2004), their HR Division Scholarly Achievement Award in 2005, and Academy of Management Review Decade Award in 2014, there are surprisingly relatively few empirical studies on this construct. For instance, Hewett et al., (2018) identified only 15 empirical articles in their review of the HR strength literature, and Wang et al (2020) reviewed 24 articles in their review on the HR strength research. Nonetheless, for our meta-analysis, we identified a total of 42 papers (comprising 65 samples and 29,444 unique participants). These included additional papers published after Hewett et al.’s and Wang’s reviews, and grey literature (including working papers and conference presentations). Still, the meta-analysis is limited by the number of studies and samples available.

The second limitation is related to the measures of perceptions of HR strength. We agree with Ostroff and Bowen (2016) that there is no universally accepted and validated measure of perceived HR strength due to inconsistent factor structures (Coelho et al, 2015; Delmotte et al, 2012; Frenkel et al, 2012), and different conceptualizations. Using different measures for the same underlying construct can be valuable to advance theory. However, if the same construct is measured in different ways without any clarification as to why this is the case, comparisons across studies will become difficult. In addition, both the Frenkel (2012) and Hauff (2017) scales focus on only a subset of the entire set of HR strength facets, and both are highly correlated with measures of HR practices (*r* = .75 for the Frenkel scale and *r* = .72 for the Hauff scale), raising concerns about their content and discriminant validity. We argue that, in addition to a more objective HR strength measure (Ostroff & Bowen, 2016), there is a need to develop further robust measures of perceived HR strength. Further research is also needed to account for the effects of each HR strength sub-dimension, as well as to bridge the gap between organizational and individual conceptions of HR strength.

Third, our meta-analysis raises additional questions, which we were unable to directly address from our dataset and/or were outside our scope of research. It is unclear which combinations of HR practices are most important in stimulating each outcome. As with the authors of the original studies, we assume that the HR practices in each organization are appropriate and effective if they are rated positively by participants. Our meta-analysis does not allow us to investigate how individual HR practices function together as a system (cf. Boon et al., 2019), nor the extent to which they are aligned with an organization’s strategic objectives. Moreover, most studies presented an aggregated HR strength measure, rather than the individual meta-features of distinctiveness, consistency and consensus. Thus, our meta-analysis only focused on an additive combination of these variables. It is therefore unclear which element or the combination of elements most strongly influence the employee and organizational outcomes. It is also unclear which element(s) may be responsible for the moderation effects that we observed. We encourage future studies to report individual HR practices and HR strength features, or otherwise make their datasets publicly available through open-science repositories. We argue there is a need to study other combinations of HR strength in greater detail to determine whether different outcomes arise from employees’ attributions for HR practices.

Fourth, most perceived HR strength studies employed a single-source, cross-sectional design, making it difficult to infer causal relationships and introducing common method variance as a potential confounder of the observed relationships. To address this issue, we compared the studies using cross-sectional designs with those using robust designs (multiple source and lagged studies). We found that the effects of perceived HR strength on employee proactive behavior diminished when robust designs were used. This effect may be expected for other source ratings of perceived HR strength, as it is likely that individual employees are only influenced by their *own* perceptions of HR strength. The comparison with the lagged studies suggests that the effect of perceived HR strength on proactive behavior diminishes over time but remains robust over at least a few months following the initial ratings of HR strength. Therefore, these comparisons suggest that the observed relationships are not merely due to common method variance. However, we strongly encourage future studies of HR strength to adopt more robust designs—including longitudinal, multi-rater and experimental designs and the use of objective measures—to make stronger causal inferences about the effects of HR strength.

Finally, our comparison of study designs revealed that the “typical” perceived HR strength study was conducted within the service industry, across multiple organizations, and within a Western cultural context. We call for HR process research to be expanded to other organizational and cultural contexts to better understand the boundary conditions of the HR strength model.

## Practical Implications

Our meta-analytic review also has important practical applications for HR professionals and line managers regarding how employee outcomes can be improved based on an HR process approach. First, our findings imply that investment in HR practices will be noticed by employees, as indicated by the positive relationship between bundles of HR practices and HR strength. Moreover, our findings show that HR strength is important for transferring the effect of HR practices to employee outcomes. HR professionals therefore need to pay attention to both the content of bundles of HR practices and how they are communicated between management and employees.

Second, our findings provide further insights to HR professionals and managers regarding how to communicate the purpose of HRM effectively. The additive effects of distinctiveness, consistency and consensus is meaningful, as it implies that the benefits of each element accumulate. When designing or implementing bundles of HR practices, managers should ensure that the bundles are easily observable and their intended purpose “stands out” from competing attributions (e.g., the purpose of training is to support quality and employee improvement, as opposed to legal compliance, exploitation or cost reduction) (Nishii et al., 2008). HR practices should also remain stable over time to ensure consistency, and their common purpose should be apparent throughout all practices. In addition, HR professionals and line managers should maintain consensus in terms of delivering the same message regarding the purpose of HR practices. The mediational effects of perceived HR strength suggest that clear signals reduce the likelihood the HR practices merely “sit on the shelf” and remain unseen by employees. Instead, such signals can help employees better understand how HR practices work together to support a clear purpose, thereby encouraging more desirable reactions and workplace behaviors from employees.

Third, the mediating effect of perceived HR strength is particularly strong when it comes to employee reactions, which comprise measures of employee engagement, organizational commitment, organizational identification, intention to leave, job satisfaction, perceived organizational support, self-efficacy and coping with change. Knowing that, HR professionals and line managers should give special attention to the meta-features of distinctiveness, consistency, and consensus when they want to use bundles of HR practices to facilitate these desirable workplace reactions. By supporting each of these meta-features, employees are more likely to recognize the intention of the HR practice bundles and therefore react to them favorably.

## Conclusion

Our meta-analysis is one of the most comprehensive systematic reviews of empirical studies of perceived HR strength to date. We go beyond previous narrative reviews (Hewett et al., 2018; Ostroff & Bowen, 2016; Wang, et al., 2020) by providing a broader and more systematic coverage of the relevant literature, using a meta-analytic approach to test our hypotheses and evaluate the progress of the field in dealing with key issues concerning perceived HR strength. In summary, our study shows that employee perceptions of HR strength matter. HR strength appears to play an important role in providing important signals about the intended purpose of bundles of HR practices, beyond mere awareness of the HR practices themselves. Collectively, our body of research suggests that HR systems that are appropriately resourced and well-communicated will be effective in bringing about a range of beneficial employee outcomes.

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# Tables

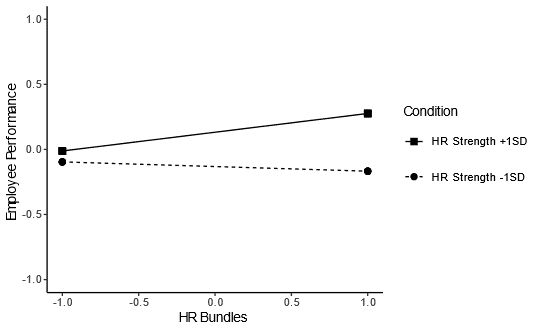
|  |  |  |  |
| --- | --- | --- | --- |
| Table 1.  *List of Constructs, Definitions, and Representative Papers* | | | |
| Construct | Definition | Constituent Measures | Representative Papers |
| Perceptions of HR Strength | The mechanisms that make a set of HR practices distinctive, consistent and consensual, leading to shared perceptions of organizational climate (Ostroff & Bowen, 2016) | Distinctiveness (including subscales of visibility, understandability, legitimacy and relevance); Consistency (including subscales of instrumentality, validity and consistency of messaging); Consensus (including subscales of agreement among principal HR decision makers, procedural justice and distributive justice) | Coelho et al., (2015); Delmotte et al. (2012); Frenkel, Restubog, & Bednall (2012) |
| Bundles of HR Practices | A bundle of mutually reinforcing HR practices intended to enhance employee commitment and/or performance. They are also referred to as high-performance work systems (Guest & Conway, 2011; Macky & Boxall, 2007). | High-commitment HR practices general scales; as well as specific measures of recruitment, training and development, performance management, flexible work arrangement, employee relations, internal promotions, employee involvement, and employee retention strategies. | Katou (2017); Sanders, Dorenbosch and De Reuver, (2008) |
| Employee Reactions | The extent to which employees perceive their role and organization positively, comprising their level of motivation, commitment and work engagement (Katou et al., 2014). | General measures of positive employee reactions to their work situation, as well as specific measures, including employee engagement, organizational commitment, organizational identification, intention to leave (reverse-coded), job satisfaction, positive affect, negative affect (reverse-coded), perceived organizational support, self-efficacy and coping with change. | Chacko and Conway (2019); Frenkel, Sanders, and Bednall (2013); Katou et al., (2014) |
| Employee Proactive Behavior | Discretionary employee behavior that is self-initiated in anticipation of future problems, needs or changes (Parker & Collins, 2010) | General measures of positive discretionary employee behavior, and specific measures including: organizational citizenship behaviors, workplace learning, employee voice behavior, innovative behavior, change-supportive behavior | Alfes et al. (2019); Bednall and Sanders, (2017); Frenkel et al. (2013) |
| Employee Burnout | States of exhaustion, cynicism and/or inefficacy resulting from prolonged exposure to job stressors (Maslach et al., 2001) | Reverse-coded measures of burnout, emotional exhaustion, fatigue, absenteeism | Aksoy (2015); Bednall & Wenzel, (2018); Frenkel et al., (2012) |
| Employee Performance | The extent to which employees meet work requirements, adapt to changes in requirements, or take self-directed actions in anticipation of changes to requirements (Griffin et al., 2007) | In-role performance, adaptive performance, and proactive performance | Bednall and Wenzel (2018); Ehrnrooth and Björkman (2012) |
| Perceptions of Organizational Effectiveness | Employee perceptions regarding organizational effectiveness, encompassing both economic performance (financial, market, shareholder) and/or achievement of non-economic objectives (e.g., employee retention, customer loyalty, corporate social responsibility) (Richard et al., 2009) | General measures of organizational effectiveness, as well as specific measures of perceived financial performance, customer loyalty, labor productivity, turnover (reverse-coded), quality of products and services, and effectiveness in achieving strategic goals. | Guest and Conway, (2011); Pereira and Gomes (2012) |

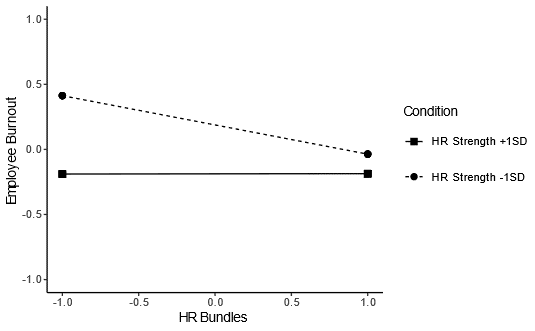
|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table 2.  *Univariate Meta-Analytic Correlations Among Constructs* | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1. Bundles of HR Practices | *k N Q r CI* | 43 17640 |  |  |  |  |  |  |  |
| 2. Perceptions of HR Strength | *k N Q r CI* | 43 17640 2503.650\*\*\* .513 [.407, .618] | 65 29444 |  |  |  |  |  |  |
| 3. HR Bundles × HR Strength | *k N Q r CI* | 31 8095 457.085\*\*\* -.137 [-.255, -.020] | 31 8095 455.403\*\*\* -.126 [-.251, .000] | 31 8095 |  |  |  |  |  |
| 4. Employee Reactions | *k N Q r CI* | 37 10954 533.741\*\*\* .472 [.391, .554] | 53 19923 849.085\*\*\* .451 [.378, .524] | 29 7535 294.919\*\*\* -.140 [-.268, -.013] | 53 19923 |  |  |  |  |
| 5. Employee Proactive Behavior | *k N Q r CI* | 29 9404 314.345\*\*\* .339 [.258, .420] | 36 13699 404.970\*\*\* .288 [.197, .378] | 26 5928 793.632\*\*\* .000 [-.136, .136] | 32 8891 194.019\*\*\* .443 [.379, .507] | 36 13699 |  |  |  |
| 6. Employee Burnout | *k N Q r CI* | 19 4514 216.743\*\*\* -.216 [-.358, -.073] | 23 5255 195.337\*\*\* -.255 [-.372, -.139] | 18 3977 69.167\*\*\* .149 [.051, .246] | 21 4614 329.561\*\*\* -.340 [-.493, -.187] | 18 4388 183.683\*\*\* -.144 [-.285, -.004] | 23 5255 |  |  |
| 7. Employee Performance | *k N Q r CI* | 10 3084 18.055\* .122 [.076, .168] | 13 3964 28.546\*\* .152 [.066, .237] | 8 2446 5.524 .077 [.025, .129] | 12 3762 27.826\*\* .239 [.146, .332] | 8 2446 5.355 .296 [.249, .344] | 8 2446 8.442 -.070 [-.122, -.018] | 13 3964 |  |
| 8. Perceptions of Organizational Effectiveness | *k N Q r CI* | 14 7641 1016.800\*\*\* .452 [.266, .638] | 15 7964 707.153\*\*\* .409 [.239, .578] | 11 4002 46.725\*\*\* -.188 [-.315, -.061] | 10 3792 119.334\*\*\* .406 [.223, .589] | 9 3442 8.893 .222 [.152, .291] | 8 2446 14.685\* -.016 [-.181, .149] | 8 2446 4.664 .181 [.123, .238] | 15 7964 |
| *Note.* The table indicates the number of samples associated with each cell (*k*), the total number of participants within samples (*N*), the *Q* homogeneity statistic, the sample-size weighted Pearson's *r*, and 99% lower and upper confidence intervals (CI). The diagonal shows the total number of samples that possess each variable and the total *N*. Each aggregated effect size was estimated using a random-effects model with a restricted maximum-likelihood estimator. | | | | | | | | | |

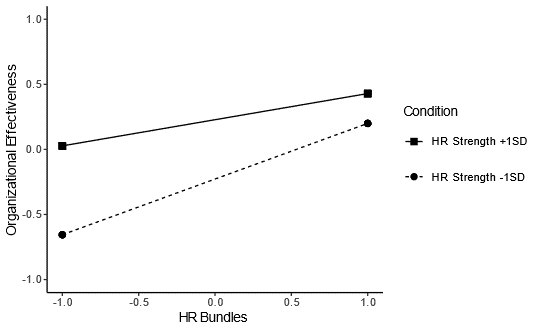
|  |  |  |
| --- | --- | --- |
| Table 3. |  |  |
| *Meta-Analytic Path Model Predicting Employee Outcomes* | | |
|  | Model 1 | Model 2 |
|  | Employee Reactions | |
| Bundles of HR Practices | .32\*\*\* (.04) | .32\*\*\* (.04) |
| HR Strength | .28\*\*\* (.04) | .28\*\*\* (.04) |
| HR Bundles × HR Strength |  | -.06 (.05) |
|  | Employee Proactive Behavior | |
| Bundles of HR Practices | .26\*\*\* (.04) | .27\*\*\* (.04) |
| HR Strength | .15\*\* (.05) | .16\*\*\* (.05) |
| HR Bundles × HR Strength |  | .06 (.05) |
|  | Employee Performance | |
| Bundles of HR Practices | .06\* (.03) | .05 (.04) |
| HR Strength | .12\*\* (.04) | .13\*\* (.04) |
| HR Bundles × HR Strength |  | .09\* (.04) |
|  | Employee Burnout | |
| Bundles of HR Practices | -.12(\*) (.07) | -.11 (.07) |
| HR Strength | -.19\*\* (.06) | -.19\*\* (.06) |
| HR Bundles × HR Strength |  | .11\*\* (.04) |
|  | Perceptions of Organizational Effectiveness | |
| Bundles of HR Practices | .33\*\* (.10) | .31\*\* (.10) |
| HR Strength | .24\* (.10) | .23\* (.09) |
| HR Bundles × HR Strength |  | -.11\* (.05) |
| *Note.* \* *p* < .05, \*\* *p* < .01, \*\*\* *p* < .001. | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Table 4.  *Between-Study Moderator Analyses Based on Study Characteristics* | | | | | | | |
|  | HR Strength (HRS) |  | Employee  Reactions (ER) | |  | Employee Proactive Behavior (EB) | |
|  | Mediation (1st stage) |  | Mediation (2nd stage) | Moderation |  | Mediation (2nd stage) | Moderation |
|  | HRB → HRS |  | HRS → ER | HRB × HRS |  | HRS → EB | HRB × HRS |
| Scale |  |  |  |  |  |  |  |
| **Delmotte (*k* = 25)** | **.51\*\*\* (.03)** |  | **.27\*\*\* (.04)** | **-.08 (.05)** |  | **.13\*\* (.05)** | **-.01 (.07)** |
| vs. Frenkel (*k* = 15) | +.24\*\* (.09) |  | +.18\*\* (.06) | +.26\* (.11) |  | +.13\* (.07) | +.20 (.12) |
| vs. Hauff (*k* = 8) | +.21\* (.10) |  | +.05 (.08) | +.16 (.12) |  | +.04 (.08) | +.24 (.13) |
| vs. Othera (*k* = 17) | -.08 (.08) |  | +.13 (.07) | +.28 (.14) |  | +.15 (.09) | +.06 (.25) |
|  |  |  |  |  |  |  |  |
| Research Study Designb |  |  |  |  |  |  |  |
| **Cross-Sectional (*k* = 50)** | **.51\*\*\* (.04)** |  | **.30\*\*\* (.04)** | **-.02 (.05)** |  | **.22\*\*\* (.04)** | **.06 (.06)** |
| vs. Other Source (*k* = 5) | **—** |  | -.08 (.10) | **—** |  | -.27\* (.12) | **—** |
| vs. Lagged (months) (*k* = 10) | **—** |  | -.01 (.01) | -.01 (.01) |  | -.03\*\*\* (.01) | .00 (.01) |
|  |  |  |  |  |  |  |  |
| Industry |  |  |  |  |  |  |  |
| **Service (*k* = 42)** | **.49\*\*\* (.04)** |  | **.30\*\*\* (.04)** | **-.05 (.05)** |  | **.15\*\* (.05)** | **.06 (.05)** |
| vs. Manufacturing (*k* = 8) | +.02 (.10) |  | -.13 (.07) | — |  | +.03 (.08) | — |
| vs. Mixed (*k* = 11) | +.25 (.14) |  | +.02 (.08) | — |  | +.02 (.09) | — |
|  |  |  |  |  |  |  |  |
| Sampling Strategy |  |  |  |  |  |  |  |
| **Multiple Orgs (*k* = 28)** | **.48\*\*\* (.06)** |  | **.26\*\*\* (.05)** | **-.02 (.10)** |  | **.14\*\* (.06)** | **-.21 (.13)** |
| vs. Establishment (*k* = 14) | +.12 (.09) |  | +.10 (.06) | +.05 (.12) |  | +.12 (.06) | +.32\* (.15) |
| vs. Firm (*k* = 21) | -.01 (.09) |  | -.01 (.07) | -.10 (.12) |  | -.11 (.07) | +.31\* (.14) |
|  |  |  |  |  |  |  |  |
| Publication Statusc |  |  |  |  |  |  |  |
| **Journal article (*k* = 42)** | **.49\*\*\* (.05)** |  | **.29\*\*\* (.05)** | **-.06 (.06)** |  | **.14\*\* (.05)** | **.03 (.06)** |
| Grey literature (*k* = 23) | .06 (.08) |  | -.04 (.06) | -.01 (.10) |  | .05 (.06) | .09 (.11) |
| *Note.* HRB refers to perceptions of bundles of HR practices and HRS refers to perceptions of HR strength; *k* refers to the number of independent samples. The baseline category for each condition and associated standardized path coefficients are presented in bold. The comparative conditions are presented below the baseline, and the average (positive [+] or negative [-]) difference from the baseline is presented. We omitted the moderating effects for comparison conditions where there were insufficient studies reporting an interaction. Studies were omitted from a comparison if they failed to provide information about each study characteristic.  a The “Other” scales included samples that used a self-developed scale used in a single study, the Coelho et al. (2015) scale (*k* = 5), or the level of agreement between employees and/or line managers (*k* = 3).  b We omitted the comparative conditions for the HRB → HRS relationship, as HRB and HRS were almost always measured together using the same method. Lags were measured in monthly intervals.  c Samples represented in grey literature included working papers (*k* = 14), dissertations (*k* = 6) and conference papers (*k* = 3).  \* *p* < .05, \*\* *p* < .01, \*\*\* *p* < .001. | | | | | | | |
|  | | | | | | | |

# Figures

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A. Interactive effect of bundles of HR practices and perceived HR strength on employee performance

  
B. Interactive effect of bundles of HR practices and perceived HR strength on employee burnout

  
C. Interactive effect of bundles of HR practices and perceived HR strength on perceived organizational effectiveness

*Figure 1.* Within-study moderating effects of HR strength on outcomes

1. We would like to thank Associate Professor Corine Boon as the acting associate editor and two anonymous reviewers for their valuable remarks on an earlier version of this article. [↑](#footnote-ref-2)