

**The effects of entrepreneurial orientation on job stressors and the moderating role of high-performance work systems: Employee perspectives from two industries**

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# **The effects of entrepreneurial orientation on job stressors and the moderating role of high-performance work systems: Employee perspectives from two industries**

Firm-level entrepreneurship has recently gained increasing popularity, as it often results in superior performance and creates a competitive advantage. Although the positive effects of entrepreneurial orientation (EO) on organisational outcomes have been researched extensively, few scholars have considered employees' perception of a firm's EO and its benefits in different organisational contexts. This study examines whether a system of human resource management practices, that is, high-performance workplace systems (HPWSs) moderates the negative relationship between employees' perceptions of organisational EO and job stressors in different settings. In line with the job demands–resources model, the findings indicate that HPWSs are beneficial, but their effects within different contexts should be noted. In manufacturing organisations, HPWSs contribute very little to reducing job stressors when EO perceptions are high, but they mitigate job stressors when EO is low. In service settings, employees who perceive their organisation's EO to be either low or high experience high levels of job stressors, irrespective of how they perceive the organisation's HPWSs.

**Keywords:** entrepreneurial orientation; job stressors; high-performance workplace systems; industry; SMEs.

## **Introduction**

The development and launch of new ventures is a recurring topic on entrepreneurs' and top managers' agenda for fuelling firm growth, market share, and success (Baron, Franklin, & Hmieleski, 2016; Kraus, 2013). Firms, however, differ in their tendencies and choices to engage in and support innovative ideas, take risks, and proactively face environmental challenges (Covin & Lumpkin, 2011). Meanwhile, external and internal stakeholders are continuously scrutinizing a firm's entrepreneurship orientation to predict its future growth and act accordingly (Arora, 2015). Therefore, firms' display of entrepreneurial orientation (EO) communicates to all stakeholders that the firm may grow considerably (Wang, Thornhill, & De Castro, 2017).

Although we know that firms with EO are more likely to succeed in terms of growth and performance, we know very little about how employees perceive EO regarding personal benefits to themselves and workplace stressors (Haar & White, 2013). Accordingly, this study poses the following research question: 'Under which conditions do employees consider a firm's EO as a resource that effectively reduces their workplace stressors?' To address this question, we draw from the job demands–resources (JD-R) model of Schaufeli & Bakker (2004) and conceptualise both EO and high-performance workplace systems (HPWSs) as resources that buffer the impact of job demands such as job stressors (i.e., role ambiguity, role conflict, work overload and resource inadequacy).

Existing literature that links EO to job stressors have yielded mixed results and shows that the two concepts have a complicated relationship. Certain studies have argued that EO is related to increased job stressors, as EO results in less hierarchical control, less formality, and less constrained control systems, leading to a potentially

ambiguous and uncertain work environment (Andersén, 2017; Wincent & Örtqvist, 2009). However, other studies concerning the relationship between firm-level entrepreneurship and performance (Rauch, Wiklund, Lumpkin, & Frese, 2009; Zahra & Garvis, 2000) have implied that a firm's EO may have a positive internal effect, as it shows employees that the firm has ambitious goals, that it directs resources to tasks with more value, and that it proactively addresses environmental challenges. Furthermore, such an environment is often reported to provide resources that enable individuals within the workplace to overcome their resistance to change and their fears concerning innovation and new business models (Monsen & Boss, 2009).

Firms with an entrepreneurial mindset often design, implement, and manage integrated sets of human resource practices (Kaya, 2006; Messersmith & Wales, 2013), commonly referred to as HPWSs. These have been found to support firm-level entrepreneurship and innovation by promoting employees' involvement, skills enhancement, and motivation. Moreover, they improve employees' attitudes and responses and reduce their job stressors (Appelbaum, Bailey, & Berg, 2000; Armstrong, 2012).

Furthermore, prior studies that focus on the relationship between EO and job stressors suggest that the direction of the relationship can be industry-dependent; this is because employees' working conditions, types of demands created, and resources vary according to industry contexts (Combs, Liu, Hall, & Ketchen, 2006). Unlike the manufacturing sector, the service industry—with its distinct characteristics—creates unique demands concerning the resources of entrepreneurially oriented organisations (Andersén, 2017). To date, empirical studies have failed to account for the moderating effects of different industry settings, despite their explanatory potential, and thereby, to be of value to entrepreneurially oriented firms in developing tailor-made resources that

can effectively combat employees' work stressors (Andersén, 2017; Atuahene-Gima, 1996). Based on a sample of small- and medium-sized enterprises (SMEs) from two distinct industry sectors, that is, manufacturing (food processing) and services (hotels), we examine the moderating effects of HPWSs and industry settings on the relationship between job stressors and employees' perceptions of EO aiming to develop tailor-made recommendations for these two specific industry contexts.

Our study extends existing theoretical and empirical knowledge in several ways. First, we respond to the call for additional research concerning the effects of EO on non-financial outcomes by adopting an employee-level perspective which is currently lacking in entrepreneurial literature (Andersén, 2017; Haar & White, 2013). Second, we examine factors that may directly reduce job stressors (Bakker & Demerouti, 2017; Bakker, Demerouti, & Sanz-Vergel, 2014) and overcome the prevailing, but narrow, view that all resources are effective in all contexts (van Veldhoven et al., 2017). Our findings show that in work environments that are perceived by employees to have a strong EO, the mitigating effects of job resources on job demands differ according to the organisational contexts in which they occur. Therefore, we extend the JD-R model by proposing that a firm's entrepreneurial mindset, if present within the right industrial setting and well-designed working circumstances that are a result of HPWSs, can become a valuable resource that optimises job demands, thereby reducing job stressors (Bakker, Demerouti, & Sanz-Vergel, 2014).

## **Theory and hypotheses**

### ***EO as a job resource***

According to the JD-R model, job stressors or demands encompass the physical, psychological, social, and organisational aspects of a job and require sustained physical

and/or psychological (i.e., cognitive or emotional) effort. Specifically, occupational job stressors embrace role ambiguity, role conflict, work overload and resource inadequacy (Kim, Price, Mueller, & Watson, 1996). Job resources are the physical, psychological, social, or organisational aspects of a job that either (1) reduce job demands and the associated physiological and psychological costs, (2) are functional in achieving work goals, or (3) stimulate personal growth, learning, and development (Schaufeli & Bakker 2004). Job resources include job control, potential for qualification, participation in decision making, task variety, and support from colleagues, among others. Therefore, resources are not only necessary to deal with job demands or to ‘get things done’, but are also important in their own right, especially pertaining to the wellbeing of employees (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Schaufeli & Bakker, 2004). Demerouti et al. (2001) further stated that job resources moderate the relationship between job demands and exhaustion, allowing employees with better job resources to cope better with their daily job demands. However, one major unanswered question in JD-R research is how job resources and job stressors (demands) relate directly to each other (Bakker & Demerouti, 2017).

Firms with a high entrepreneurial orientation support new ideas and processes (i.e., they are innovative), engage in high risk projects (i.e., they are risk-taking), and act as first movers rather than as followers (i.e., they are proactive) (Lumpkin & Dess, 1996). Based on the main theory of the resource-based view, Ferreira & Azevedo (2007) ascertained that on an organisational level, entrepreneurial ventures possess unique resources, for instance, human and financial capital as well as access to networks, that determine entrepreneurial successes.

This study defines EO as a job resource in the context of the JD-R model, because previous scholars have noted that highly entrepreneurially-oriented firms

allocate and share important organisational resources to units to stimulate employees' innovative behaviour and to enhance entrepreneurial skills. Specifically, organisations with a high entrepreneurial orientation design policies and practices aimed at employee involvement, teamwork, flexible job design, broad career opportunities, and behaviour-based appraisal in further support of their entrepreneurial orientation (Cooke & Saini, 2010; Jiménez-Jiménez & Sanz-Valle, 2008). These organisations tend to promote creativity and entrepreneurial capabilities among their employees by developing autonomous job positions and encouraging internal cooperation that covers different formalised job assignments (Andersén, 2017; Jong, Parker, Wennekers, & Wu, 2015). Accordingly, as discussed by Cloutier, Cueille, and Recasens (2017), entrepreneurially oriented organisations develop entrepreneurial teams that—through an extended support network—supply human and financial resources to build capabilities, sustain innovation, and minimise the negative effects of the organisation's entrepreneurship efforts concerning employees, such as job stressors.

Employees interpret managerial practices, procedures, and actions as both tangible and intangible resources that are governed by the norm of reciprocity (Whitener, 2001). Earlier studies have adopted a social exchange perspective in which a firms' allocation of internal resources across functional departments resulted not only in the successful exploitation of entrepreneurial opportunities and organisational performance (De Clercq, Dimov, & Thongpapanl, 2010), but also resulted in positive job attitudes and work behaviours in employees (Giannikis & Nikandrou, 2013). Based on the above arguments and in line with the JD-R theory, we propose that effective resource sharing between functional departments—which is crucial for the successful exploitation of entrepreneurial opportunities (De Clercq, Dimov, & Thongpapanl, 2010; Eisenhardt & Martin, 2000)—optimises job demands and therefore, reduces employees'

job stressors. We base our first hypothesis below on this proposal:

H1: Employees' perceptions of EO are negatively related to employees' perceived job stressors.

***The moderating role of HPWSs in the relationship between EO and job stressors***

Recent studies concerning strategic human resource management (HRM) have focused on HPWSs. HPWSs refer to integrated systems and HRM practices designed to create highly committed, motivated, and engaged employees. When present, these systems result in a measurable increase in productivity and profitability for the organisation (Appelbaum et al., 2000; Datta, Guthrie, & Wright, 2005; Giannikis & Nikandrou, 2013). As there is no agreement on which HRM practices constitute HPWSs (Boxall & Macky, 2014), examples of the systematic reinforcing of HRM practices may include (among other things) selective staffing; extensive training; competitive compensation; internal promotion; performance-contingent pay; results-oriented appraisals; employee participation; formal complaint-resolution systems; teamwork design; and job security (Chi & Lin, 2011).

An important characteristic of HPWSs is the theoretical perspective of internal and external fit (Delery, 1998). Internal fit refers to the relationships among individual HRM practices that offer mutual support and enhance effectiveness (Hayton, 2003). Therefore, compared to traditional/individual HRM practices, HPWSs are described as systems of HRM practices with bundling effects (Applebaum et al., 2000). External fit refers to the degree of consistency or congruency between a firm's HRM practices and its business strategy (Balkin & Gomez-Mejia, 1990; Hayton, 2003).

Based on the theoretical perspective of internal and external fit, previous studies have argued that the effective design and implementation of a HRM system (internal fit)



is crucial for supporting a firm's entrepreneurial strategy (external fit) (Chadwick & Dabu, 2009; Wei & Lau, 2008; Wiklund & Shepherd 2003). Scholars have presented evidence regarding the interaction between HPWSs and firm-level entrepreneurship as well as its relationship with employees (Quinn, Spreitzer, & Lam, 2012) and organisational outcomes (Messersmith & Wales, 2013). Kaya (2006) showed that innovativeness, risk-taking, and proactiveness—when supported by a formal HRM system—enhance firm performance. Hayton (2003) noted that when small businesses aggregate certain compensatory human resource practices, the effectiveness of EO increases, while Kroon, van de Voorde, and Timmers (2013) contended that the limited resources of small and innovative firms motivate them to use HPWSs to support growth-oriented strategies. Therefore, when HRM practices are horizontally harmonised to complement each other and vertically aligned with the organisation's entrepreneurial strategy, they are expected to support employees' work resources (Quinn et al., 2012) and constitute a critical resource in supporting the firm's entrepreneurial activities (Chadwick & Dabu, 2009).

Exploring the relationships between HPWSs and work-related stressors, Appelbaum et al. (2000) demonstrated that HPWSs are associated with less intense job stressors, for instance, inadequate resources, role overload, and conflicts with co-workers. Using the JD-R model, we conceptualise HPWSs as job resources enabling employees who perceive their firm as entrepreneurially-oriented to attain work-related goals, stimulate personal growth and development, and address the increased demands of their jobs (Bakker & Demerouti, 2017; Quinn et al. 2012). Conceptualising HPWSs as job resources is a novel approach and extends HRM theory by proposing a new mechanism (i.e., job resources), by which HRM can affect employees' attitudes and behaviours (Cooke, Cooper, Bartram, Wang, & Mei, 2016). Based on the theoretical

perspective of internal and external fit and the synergetic effects of EO and HPWSs, our next hypothesis is as follows:

H2: HPWSs moderate the relationship between employees' perceptions of EO and job stressors, meaning that the relationship is more negative when perceptions of HPWSs are high.

***The moderating role of industry type in the relationship between EO and job stressors***

Human resources research has so far largely overlooked the impact of industry characteristics on the effectiveness of market orientation on employees (Datta et al., 2005). The type of industry appears to affect employees' working conditions, demands, and resources, mainly due to services unique characteristics (Combs et al., 2006). To a large extent, the growth of the service industry has led to a large number of low-wage or low-skill jobs that feature high levels of job demands, limited access to job resources, low decision attitudes, and high turnover rates (Braveman, 1974). However, empirical studies have failed to systematically account for the moderating effects of the industry setting on the relationship between EO and job stressors, despite recent suggestions regarding its explanatory potential (Andersén, 2017; Combs et al., 2006). Most studies on the subject either treat the industry as a control variable or arbitrarily omit it from their models (Datta et al., 2005). Consistent with the JD-R model and motivated by recent calls to examine how job resources and job demands relate to each other in different work contexts (see Bakker & Demerouti, 2017), we endeavour to show that buffering effects concerning employees' perceived EO on job demands depend upon the industrial contexts they occur in (manufacturing/services).

### *Manufacturing firms and EO-Job stressors relationship*

Operations in the manufacturing industry involve the use of expensive and potentially dangerous machinery (Combs et al., 2006), which is particularly relevant in the context of entrepreneurially-oriented manufacturing firms. Additionally, manufacturing firms are frequently subject to labour-union and other institutional pressures (such as NGOs) concerning employees' wellbeing (Kaufman, 2004). To ensure that employees' interests and welfare are adequately addressed in a new work environment, budgets are reviewed extensively and rules and procedures are re-examined to ensure that it benefits all employees (Ettlie & Rosenthal, 2011). By merging and aligning new or innovative production with other managerial systems that are already in place, such as total quality management, entrepreneurially-oriented manufacturing organisations can overcome employees' resistance to change by providing them with the necessary training and empowerment to respond positively to change and adapt to new situations, improving their performance (Boxall & Macky, 2007). Therefore, according to the JD-R model, we expect employees in manufacturing firms with a perceived EO to experience a reduction in job stressors, as this work context may be perceived as an adequate resource in alleviating job demands due to the tangible, standardised, closely monitored, and predictable operational features of the work environments of these firms.

### *Services firms and EO-job stressors relationship*

The service industry setting is a classic and well-used context for studying employees' emotional exhaustion due to job stressors (Biron & van Veldhoven, 2012). Research and development concerning the EO of service firms usually follow an interdependent, informal, and creative loop that depends heavily on human capital, mainly due to the service industry's characteristics: intangibility, inseparability, heterogeneity, and perishability (Ettlie & Rosenthal, 2011).

Intangibility means that new services are experiences, rather than something that is, for instance, manufactured. While new services can provide employees with opportunities to develop their knowledge and prove their capabilities, they are almost impossible to review and control before an actual transaction, causing employees to experience uncertainty in their work (Zeithaml, Parasuraman, & Berry, 1985).

Inseparability refers to the interaction between customers and service providers, which characterises every service transaction (Vargo & Lusch, 2008). However, new services are more likely to engender customer dissatisfaction and complaints, as they are difficult to pre-test and control in advance. Furthermore, customers' characteristics (such as difficult or irate customers) and their ambiguous expectations concerning their role in new service delivery may demand greater mental, psychological, and emotional effort from service employees, leading to exhaustion among the latter (Grandey, Fisk, & Steiner, 2005). Heterogeneity reflects the variability in the quality of service delivery (Zeithaml et al., 1985), particularly when concerning new services, as applying strict service protocols are almost impossible without jeopardising the 'experiential factor' of the service experience. Variability—while providing opportunities for customised services, especially in the case of new services—also calls for boundary-spanning new roles between firms and their customers. This serves to overcome differences in objectives and time schedules, teamwork, and information dissemination among the various organisational functions as a response to the interdependent, informal, and creative loop that innovative service entails (Ettlie & Rosenthal, 2011; Sok & O'Cass, 2015). Such situations often lead to tension among employees, which can deplete service employees' energy reservoirs and strain their job resources (Gounaris, Chatzipanagiotou, Boukis, & Perks, 2016). Finally, perishability means that—unlike new products—new services are produced and consumed simultaneously, causing

difficulties in coordinating supply and demand (Lovelock & Gummesson, 2004). These characteristics, often beyond the employees' control, can make the matching of demand and supply much more difficult and uncertain for new services than for new products, which can use existing systems (Lovelock, 1983). Unsurprisingly, in entrepreneurial service organisations, the service blueprint changes frequently and profoundly; this has the potential to intensify employees' job stressors (Siggelkow & Rivkin, 2005).

Based on the above, and in accordance to the JD-R model, service employees who view their firms as having an EO (as opposed to their manufacturing counterparts) may not perceive EO as an adequate resource for addressing the operational features of their firms, which leads us to our next hypothesis:

H3: The relationship between employees' perceptions of a firm's EO and job stressors depends on the industry in which the firm operates, indicating that the relationship is more negative in the manufacturing than in the service industry.

### ***The joint moderating role of HPWSs and industry type in the relationship between EO and job stressors***

The second hypothesis presents HPWSs as a fitting resource for EO and highlights their role in reducing employees' perceptions of job stressors. The third hypothesis then suggested that, within the service industry context, organisations exhibit features that may require more resources than that offered by EO, to reduce workplace stressors. Existing literature points out that resources may be effective in certain organisational contexts but less effective in others (van Woerkom, Bakker, & Nishii, 2016) and may, therefore, not always have the intended and expected positive effects (van Veldhoven et al. 2017). Nonetheless, past theoretical models have often overlooked how, why, and in which working contexts job resources may be either beneficial or have no discernible

effect on employees' job stressors (van Veldhoven et al., 2017; van Veldhoven, de Jonge, Broersen, Kompier, & Meijman, 2002; van den Broeck et al., 2017). Therefore, the next logical question would be whether the benefits derived from connecting HPWSs to EO can influence employees' perception regarding job stressors even within the challenging service industry.

HPWSs spring mainly from a management perspective in the manufacturing sector (Liao, Toya, Lepak, & Hong, 2009). As hypothesised, the more predictable operational features of a manufacturing firm create a context in which employees perceive EO as an adequate resource to efficiently decrease job demands. To this end, we propose that HPWSs are a fitting resource that support the strategic orientation of a firm, therefore minimising employees' perceptions of job stressors. This minimisation is even more effective in conjunction with EO resources. Therefore, the negative relationship between employees' perceived EO and job stressors in the manufacturing sector is more intense when their perceptions of HPWSs are high.

Concerning the service industry, the creative loop, its intangible and unstandardised nature, and the co-creation of new services with customers make the context particularly challenging and more resource intense. To address these challenges, employees frequently search for additional cues that corroborate the fit between the organisations' EO and their capabilities and willingness to support it effectively. Therefore, when HPWSs are implemented in support of an entrepreneurially oriented strategy, employees are more likely to feel empowered and well-equipped, reducing job stressors.

In contrast, they may consider the absence of HPWSs to be unwillingness or incapability on the part of their organisation to effectively address the challenges that lie ahead. This may cause an inconsistency between job demands and available job

resources. Additionally, employees may become confused about the consequences of such an orientation or view it with disdain. These circumstances may, in turn, create downward spiral effects that often lead to conflict and uncertainty (Gounaris, Chatzipanagiotou, Boukis, & Perks, 2016), increasing perceived job stressors (Srivastava & Tang, 2015). With this in mind, we propose our next hypothesis:

H4: HPWSs and industry type together moderate the relationship between employees' perceptions of EO and job stressors. Specifically: (a) in the manufacturing sector, the negative relationship between employees' perceived EO and job stressors is more intense when perceptions of HPWSs are high compared to when perceptions of HPWSs are low; and (b) in the service industry, there will be a negative relationship between employees' perceived EO and job stressors but only when perceptions of HPWSs are high.

Figure 1 presents this study's conceptual framework based on the proposed research hypotheses.

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## **Methodology**

### ***Sample***

For this study, data from full-time employees working in Greek SMEs (firms with fewer than 250 employees) in two industries with contrasting characteristics (manufacturing vs. services) were collected. To this end, 400 food-processing firms and 450 hotels were selected from the ICAP business directory, the most widely-recognised and accepted business database in Greece. These businesses were first contacted telephonically. After

this initial contact, 58 firms agreed to participate in the survey. The response rates for manufacturing and service firms were 7.75% (N = 31) and 6.00% (N = 27), respectively. This response rate relates favourably to survey-based HPWSs studies reviewed by Becker & Huselid (1998), which had response rates ranging from 6.00% to 28.00%, with an average of 17.40% (Guthrie, Spell, & Nyamori, 2002).

The number of employees per firm ranged from 37 to 232, with an average of 152.79 per firm, while the average firm age was 9.33 years, ranging from 3 to 63 years. To address non-response bias, the employee numbers and firm age of the respondent firms were compared to those of a group of 100 randomly selected, non-participating firms. The results of the t-tests were non-significant (firm age:  $t = -0.61$ ,  $p > 0.05$ ; and number of employees:  $t = -1.56$ ,  $p > 0.05$ ). While the threat of non-response bias cannot be ruled out, this comparison confirms the representativeness of the sample.

After excluding questionnaires with incomplete data, 636 ( $N_{\text{manufacturing}} = 344$ ,  $N_{\text{services}} = 292$ ) usable responses were collected from the 1,450 firms that were approached (overall response rate: 43.86%; response rate in manufacturing: 44.40% from a total of 775; response rate in services: 43.20% from a total of 675). The response rate per company varied between 36% and 72%. Of the respondents, 53.10% were over 34 years of age and 42.50% had fewer than five years' tenure in the organisation. The sample included 50% female participants.

### ***Measurement of constructs and measure validation***

#### *Perceived EO*

The three dimensions of EO—namely innovativeness, risk-taking, and proactiveness—were measured with nine items developed by Miller & Friesen (1982) and validated by Covin & Slevin (1989). Responses to these items were recorded using a seven-point



scale ranging from 1 = 'Low Entrepreneurial Activities' to 7 = 'High Entrepreneurial Activities'.

We conducted a confirmatory factor analysis (CFA) to validate EO as a second-order factor and the three dimensions of innovation (alpha = 0.81), risk-taking (alpha = 0.79), and proactiveness (alpha = 0.83) as first-order factors. The model fits the data well:  $\chi^2_{[24]} = 71.60$ ,  $p < 0.001$ ,  $\chi^2/df = 2.98$ ; root mean square error of approximation (RMSEA) = 0.056 (90% CI: 0.041; 0.071); normal fit index (NFI) = 0.97; comparative fit index (CFI) = 0.98; Tucker-Lewis Index (TLI) = 0.97. Furthermore, the composite reliability of EO (CR) was 0.82, with a benchmark of 0.80. The average variance extracted (AVE) value was 0.60 with a benchmark of 0.50, indicating adequate internal consistency for the measurement scales (Fornell & Larcker, 1981). Next, we combined the three dimensions to develop a single variable to represent employees' EO perception. The coefficient alpha reliability for employees' perceptions of EO was 0.75.

### *Perceived HPWSs*

For the purposes of this model, we adapted the HPWSs measure developed by Chi & Lin (2011) and Wei, Han, & Hsu (2010). This measure consists of ten constructs (two items per practice), namely selective staffing; extensive training; competitive compensation; internal promotion; performance-contingent pay; results-orientated appraisals; employee participation; formal complaint-resolution systems; teamwork design; and job security. Participants were asked to provide their level of agreement on a seven-point scale, ranging from 1 = 'Strongly Disagree' to 7 = 'Strongly Agree'.

The second-order CFA of the twenty HPWS items (specifying HPWSs as a second-order factor and the ten HR practices as first-order factors) displayed a satisfactory model fit:  $\chi^2_{[160]} = 405.56$ ,  $p < 0.001$ ,  $\chi^2/df = 2.54$ ; RMSEA = 0.049 (90%

CI: 0.043; 0.055); NFI = 0.96; CFI = 0.98; TLI = 0.97. Furthermore, the CR (0.97 > 0.80) and the AVE (0.77 > 0.50) provide support for convergent validity. The internal consistency estimate—derived by Cronbach’s alpha—for the combined ten HPWS items was 0.95.

### *Job stressors*

We measured the job stressors (role ambiguity, conflict, workload, and inadequate resources) by using sixteen items developed by Kim et al. (1996). The coefficient alpha reliability scores for role ambiguity, conflict, workload, and inadequate resources were 0.82, 0.88, 0.81, and 0.87 respectively. Participants were asked to provide their level of agreement on a seven-point scale, ranging from 1 = ‘Strongly Disagree’ to 7 = ‘Strongly Agree’.

Additionally, we conducted a second-order CFA of the sixteen job-stress items, specifying job stressors as a second-order factor and the four dimensions as first-order factors. This model fits the data well:  $\chi^2_{[100]} = 271.94, p < 0.001, \chi^2/df = 2.72$ ; RMSEA = 0.052 (90% CI: (0.045; 0.060); NFI = 0.95; CFI = 0.97; TLI = 0.96. The value of the CR (0.86 > 0.80) and the value of the AVE (0.60 > 0.50) indicate convergent validity. Therefore, we combined the four job stressors to develop a single variable to represent job stressors. The coefficient alpha reliability score for job stressors was 0.88.

### *Control variables*

A number of demographic, work-related, and organisational variables were considered to control for individual variations. In line with previous studies (Monsen & Boss, 2009), we collected information concerning gender, age, educational level, tenure, and employment position status. We included a dummy variable for gender (0 = female, 1 = male), job position (0 = staff/worker, 1 = management), and industry (0 = services, 1 =

manufacturing). Age, education, and tenure were measured by categorical questions with six categories each. For instance, concerning age, (1) represented employees between the ages of 18 and 24 and (6) represented 65 years or older. Regarding education, (1) represented a high-school level qualification and (6) represented a postgraduate level qualification. Regarding tenure, (1) represented less than 1 year and (6) represented more than 16 years. Additionally, we controlled for two organisation characteristics: firm age and firm size. We measured firm age as the number of years from the firm's founding date to control for organisational life-cycle effects. Older firms tend to have lower ratios of research and development expenditure to total assets (Acharya & Xu, 2017). Firm size was measured as the logarithm of the number of employees (Arend, 2014; Wang, 2008). Concerning organisation-inertia, the complexity of larger organisations compared to smaller firms subjects the former to inertia, making it more difficult for them to develop, accept, and implement creative ideas (Hannan & Freeman, 1984).

Additional measurement tests (independence of measurement model, measurement equivalence, and common method variance) are shown in Appendix 1. Our measurement model fits the data well compared to other models and its factor structure was invariant between industries. Moreover, there were no common method variance issues in our study.

## **Results**

The descriptive statistics, pairwise correlations, and Cronbach alphas of our model are shown in Table 1. The results show employees' perceptions of EO to be significantly and positively correlated with HPWSs ( $r = 0.36, p < 0.001$ ) and negatively correlated with job stressors ( $r = -0.39, p < 0.001$ ), while perceived HPWSs were negatively related to job stressors ( $r = -0.47, p < 0.001$ ).

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Table 1 about here  
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As individual responses were nested within firms, we applied hierarchical multilevel modelling to test our hypotheses and to address the non-independence in our data. First, using HLM 6.08 software (Raudenbush & Bryk, 2002), we tested the null model—in which no predictors were entered—to assess the variance between the groups. The intraclass correlation coefficient (ICC [1]) showed that 23.75% of the variance in overall job stressors are found between groups (11.46% for role ambiguity, 21.15% for conflict, 14.91% for workload, and 15.05% for inadequate resources). Therefore, the hierarchical structure of the data is appropriately addressed. We then entered each control variable (level 1 & 2) and main effect (Table 2, Model 1), followed by the level-1 two-way interaction terms (Model 2), the cross-level two-way interaction terms (Model 3), and the cross-level three-way interaction term (Model 4). To reduce multicollinearity, we standardised the main effects of employees' perceived EO and HPWSs before the level-1 interaction term was created. Additionally, we grouped mean-centred level 1 variables and grand mean centred all the continuous level 2 variables to avoid spurious cross-level effects (Enders & Tofighi, 2007). To conduct the deviance test—which assesses whether the model fit improved after the inclusion of interaction terms—we employed the full maximum estimator (Raudenbush & Bryk, 2002).

The results of our research suggest a negative relationship between employees' perceptions of EO and job stressors. As Model 1 in Table 2 illustrates, the pattern of the relationship is in the expected direction, but is marginally significant ( $\gamma = -0.24$ ,  $p = 0.07$ , one-tailed). Therefore, our results support Hypothesis 1.

The second hypothesis postulated that the relationship between employees' perceived EO and job stressors would be more negative when employees' perceptions

of HPWSs are high. Contrary to this assumption, our results indicate that the interaction of employees' perceived EO with HPWSs is insignificant ( $\gamma = 0.04$ ,  $p = 0.20$ , one-tailed). Hence, our results do not support Hypothesis 2.

In Hypothesis 3, we suggested a relationship between employees' perceptions of EO and job stressors depending on the industry type (manufacturing vs. service). For those working in manufacturing firms (food-processing), the relationship would be negative, while for those working in services (hotels), the negative relationship would diminish. The results shown in Table 2 support this moderating effect ( $\gamma = -1.05$ ,  $p < 0.01$ ), and Figure 2 shows the plot of this effect. We probed the nature of the interaction by analysing simple slopes, following the work of Aiken & West (1991) and Preacher, Curran, & Bauer (2006). The pattern of the interaction revealed a significant negative relationship between employees' perceived EO and job stressors for manufacturing ( $b = -0.49$ ,  $t = -2.56$ ,  $p = 0.01$ , one-tailed) and a marginally significant positive relationship for services ( $b = 0.50$ ,  $t = 1.56$ ,  $p = 0.06$ , one-tailed). These findings are consistent with Hypothesis 3.

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Table 2 about here  
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Hypothesis 4 suggested that, depending on the industry (manufacturing vs. service), employees' perceptions of HPWSs would moderate the relationship between employees' perceived EO and job stressors. The results show a positive and significant three-way interaction effect ( $\gamma = 0.25$ ,  $p < 0.01$ , one-tailed). To clarify the nature of this interaction, we plotted the relationship between employees' perceived EO and job stressors (see Figures 3a and 3b) at high (one SD above the mean) and low (one SD below the mean) levels of employees' perceived HPWSs and according to industry

(Aiken & West, 1991). We also complemented the visualisation of the three-way interaction with simple slopes analysis (Preacher et al., 2006) and pairwise comparisons of the simple slopes (Dawson & Richter, 2006).

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Insert Figures 3a and 3b about here  
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Interestingly, Figure 3a shows that for those in the manufacturing industry, low values of employees' perceived HPWSs make the suggested negative relationship between their perceived EO and job stressors even stronger ( $\gamma = -0.78$ ,  $t = -3.53$ ,  $p < .01$ , one-tailed), whereas high HPWSs values lessen the intensity of this relationship ( $\gamma = -0.45$ ,  $t = -2.27$ ,  $p = 0.01$ , one-tailed). Furthermore, pairwise comparisons of the simple slopes revealed that the simple slopes are significantly different from one another ( $t = -2.44$ ,  $p = 0.02$ , two-tailed). These results indicate that in the manufacturing sector, both employees' perceived EO and HPWSs have a noticeable impact on reducing job stressors. Therefore, embracing either EO or HPWSs seems important for reducing job stressors, but combining them provides no additional benefits. Consequently, it can be stated that in manufacturing, employees' perceptions of their firms' strategic orientation towards entrepreneurial practices and behaviours appear to be sufficient to alleviate job stressors.

In contrast, those working in service organisations showed the opposite effect. Figure 3b shows that employees' perceived EO is positively related to their perceived job stressors. At low HPWSs values, this positive linkage is significant ( $\gamma = 0.72$ ,  $t = 1.99$ ,  $p = 0.02$ , one-tailed), while at high HPWSs values, this positive effect is marginally significant ( $\gamma = 0.52$ ,  $t = 1.49$ ,  $p = 0.07$ , one-tailed). However, comparing the simple slopes showed an insignificant pairwise difference value ( $t = -1.43$ ,  $p = 0.15$ , two-tailed). These results suggest that in the service industry, having an increased

perceived EO may substantially increase job stressors, irrespective of the level of perceived HPWSs.

Overall, the findings suggest that employees' EO perceptions interact with their HPWSs perceptions in reducing job stressors, but only in the manufacturing industry. This negative relationship is more pronounced when HPWSs are low than when they are high. Yet, it seems that HPWSs are most necessary when employees' perceptions of EO are low. Conversely, in the service industry, the relationship between employees' perceived EO and their perceived job stressors becomes positive, irrespective of how high or low employees' perceptions of their firm's HPWSs are. Therefore, although we found a significant three-way interaction effect, the nature of this interaction offers limited support to Hypothesis 4.

We also ran four post-hoc analyses using the dimensions of employees' perceived job stressors (ambiguity, conflict, workload, and inadequate resources) as dependent variables to check whether the interaction effects described above would hold in all dimensions. We found both significant and marginally significant interaction effects between employees' EO perceptions and industry, which are very similar to those reported by the overall job stressors construct. Additionally, the nature of the three-way interaction for all job stressors—except for conflict—is comparable to those depicted in Figures 3a and 3b.

Our results seem to be robust and the inclusion of the control variables did not influence the pattern of the results significantly. Details pertaining to the post-hoc analysis and related robustness checks appear in Appendix 2.

## **Discussion**

Responding to recent JD-R research on how job resources and job demands are directly

related to each other (see Bakker & Demerouti, 2017), we examine the conditions under which employees consider a firm's EO to be a resource that can effectively reduce workplace stressors. Specifically, we adopted an employee-level perspective, which is new to entrepreneurial literature (Messersmith & Wales, 2013), to examine the moderating roles of the work conditions in different industry settings and HPWSs on the relationship between employees' perceptions of EO (resources) and perceived job stressors (demands).

Initially, we explored the direct relationship between employees' perceptions of EO and perceived job stressors. Following the JD-R model (Schaufeli & Bakker, 2004), we hypothesised that employees may perceive EO as a job resource that reduces job stressors (job demands). The results, which were along expected lines, support our first hypothesis. This finding implies that perceived EO has properties that help employees to cope with job stressors.

Based on the concept of internal and external fit, organisations with EO adopt HPWSs to provide employees with the necessary job resources to reduce job demands. Thus, we conceptualised HPWSs as job resources that enable employees to attain work-related goals and address the growing job demands (as in Bakker & Demerouti, 2017). From an employee's point of view, the high levels of HPWSs are expected to reinforce the negative impact of his or her perceived EO on job stressors. However, contrary to our expectations, the effect of HPWSs on this relationship was not empirically supported. This is in line with recent calls to overcome the prevailing and rather narrow minded conceptualisation that all resources can be effective in all contexts (see van Veldhoven et al., 2017). Furthermore, it indicates that the two resources (EO and HPWSs) require a suitable context to activate their moderating effect on job stressors. Prior studies point in a similar direction, implying that the ambiguous relationship



between EO and job stressors is often dependent on the industry (Andersén, 2017; Bakker & Demerouti, 2017; Datta et al., 2005).

For this reason, we also explored the relationship between employees' perceived EO and job stressors in two different industries with the aim to develop tailor-made recommendations for these specific contexts. In line with our hypothesis, employees' EO perceptions in the manufacturing industry was found to be related to a reduction in job stressors. Institutional pressures, as well as the expensive and potentially hazardous processes in manufacturing organisations compel firms to ensure that employees' interests and welfare in their work environment are suitably addressed; this leads to a reduction in perceptible job stressors. In contrast, we hypothesised a less intense negative effect for employees' perceptions of EO and job stressors in service firms; this is because the nature of the new service offerings often forces employees to respond to an unstable and unpredictable work environment. While the findings were only marginally significant for the service industry, they indicated a clear tendency towards a positive relationship between the two variables. This means that service industry employees who, unlike their manufacturing counterparts perceive their firms to have an EO may not perceive it to be an effective resource in addressing the operational requirements of their work environments.

Our results failed to support our earlier presumption that high levels of HPWSs reinforce the negative relationship between perceived EO and job stressors. This finding suggests that the joint effect of EO and HPWSs (resources) on job stressors depend on the industry type, as the findings were positive for the service industry and negative for the manufacturing industry. The results for this three-way interaction (EO x HPWSs x Industry) indicate that manufacturing employees' perceptions of EO interact with their HPWSs perceptions in mitigating their perceived job stressors. Conversely, the

relationship between service employees' perceived EO and job stressors becomes positive but insignificant, irrespective of how high or low the employees' perceptions of their firm's HPWSs are. This suggests that the perceived EO of employees in the service industry may necessitate different and better aligned to the operational particularities of the industry's working context HRM practices in compacting job stressors. The results of this study provide both theoretical and practical implications, extending previous knowledge in the HR, entrepreneurship, and services fields.

### ***Theoretical implications***

This study contributes to prior research in several ways. First, we addressed the effects of EO on non-financial outcomes by considering the employee-level perspective, which has not been extensively investigated within the context of entrepreneurial literature (Andersén, 2017; Haar & White, 2013). Second, we examined the factors that may directly reduce job stressors (Bakker & Demerouti, 2017; Bakker, Demerouti, & Sanz-Vergel, 2014) and overcome the prevailing narrow-minded conceptualisation that all resources are effective in all contexts (van Veldhoven et al., 2017).

This study is the first to conceptualise EO and HPWSs perceptions as resources and to examine their direct relationship with job demands. In doing this, we extend the JD-R model into the strategic HRM research area and reveal a new mechanism by which EO and HPWSs influence employees' attitudes and behaviours. Specifically, our findings suggest in which working contexts resources such as EO and HPWSs can have either a positive or no particular effect on employees' perceived job stressors (van Veldhoven et al., 2017; van Veldhoven et al., 2002; van den Broeck et al., 2017).

By highlighting the importance of the industry context, it was shown that manufacturing companies' employees perceive EO as a resource that is capable of efficiently reducing their job demands and the presence or absence of HPWSs has a

minor influence. However, the findings indicate that job stressors in the service industry are not buffered by the employees' perceived EO and the commonly used HPWSs. It is possible that the entrepreneurial-oriented service industry's unique work settings necessitate service-specific HR practices to assist employees in addressing experiential and social needs at work, which is a consequence of their intangible and unstandardised co-production with their customers. Therefore, the influence of employees' perceptions of EO or HPWSs resources across industries should not be generalised, unless the characteristics of each industry setting are accounted for. We propose that HPWSs should not be regarded as a panacea but should be treated critically as 'best practice' in alleviating job stressors and enhancing work-related well-being. To this end, new HR practices should be tailored to the characteristics and unique entrepreneurial settings of the service industry.

### ***Managerial implications***

Concerning manufacturing firms, the findings suggest that employees who perceive their firm as having strong EO can optimise their job demands. Manufacturing organisations in which employees' have a high perceived EO may want to reassess their extensive investments in HPWSs considering their inherent cost, which might increase the cost of the final products and decrease their competitiveness in the market. This finding may be particularly useful to SMEs, as they are subject to many size-related liabilities, for example, slack and poorly trained human resources that, when combined, weaken the legitimacy of the products they produce (Patel & Conklin, 2012). However, such an HR-related expense cut should be carefully examined, given that HPWSs are essential for other employee outcomes not examined in this study. Conversely, in firms in which employees have low EO perceptions, bundles of HRM practices could be used to reduce employees' job stressors and improve the firm's competitiveness (Douglas &

Fitzsimmons, 2013; Monsen, Patzelt, & Saxton, 2010).

Concerning service-industry firms with high perceived EO, our findings suggest that to reduce employees' job stressors, HPWSs should be adjusted to the industry's specific characteristics. Therefore, service organisations should reconsider their employees' perceptions of EO and apply suitable HR practices for addressing their job stressors. Such HR practices should be tailored to suit the experiential nature of the service industry, demand fluctuation, and co-production with the customers. For example, they may focus on increasing employees' personal resources such as psychological flexibility in the recruitment process and developing their soft skills (Biron & van Veldhoven, 2012). These services-tailored HR practices should encompass front-line employees' proactive abilities—for instance learning to master new skills, asking for help/information, and reducing bureaucracy (Bakker & Demerouti, 2017)—and competencies in customer-sensing skills, as new service concepts are often the result of supplier and customer co-production (Kindström, Kowalkowski, & Sandberg, 2013). Finally, empowering customer-contact employees to help design and implement new services and procedures may help them overcome resistance to change and reduce job stressors (Umashankar, Srinivasan, & Hindman, 2011).

### ***Limitations and directions for further research***

This study has limitations that present opportunities for future research. The first is that the data concerning EO and HPWSs were collected from employees alone. This study followed the suggestions of Macky & Boxal (2007), who state that employees' experiences of managerial policies and practices are more important to employee-level outcomes than managerial assertions about these practices. We recommend further extensive research by interviewing managers, which will reveal the managerial

perspective on the links between EO, HPWSs, and employees' outcomes to enhance our understanding of entrepreneurial culture.

Additionally, the design of this study is cross-sectional, which precludes statements of causality. Future studies could possibly assess the dependent variables to ascertain whether the relationships found above remain valid over time. Furthermore, the use of self-reports could raise concerns that our data are contaminated by common method variance (CMV). However, we performed post-hoc tests to assess the impact of CMV and found that its effect was negligible. Lastly, future studies could also complement this study's employee-level approach by adopting a multi-level design.

## **Conclusions**

This study extends the JD-R model by examining the direct relationship between job resources and job demands within different work contexts (Bakker & Demerouti, 2017). By conceptualising employee perceived EO and HPWSs as job resources, we postulate that—in organisations with an EO—HPWSs can have a positive influence on employees' job stressors, but only within specific contexts. As an example, HPWSs can be effective in a manufacturing setting but only under certain conditions, such as when EO resources are absent or low. Moreover, HPWSs are ineffective in an entrepreneurial-oriented services setting, which points to the need for the design and implementation of alternative services-tailored HR practices. We hope that the theoretical and managerial implications of this study provide researchers with valuable insight and lead to new studies in this interesting and important line of research.

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## **Online appendices**

### **Online appendix 1: Additional measurement tests**

#### *Independence of measurement model*

In addition to assessing the validity of the second-order factors, we conducted a CFA to ensure that they were independent. Specifically, we estimated a three-factor model with one factor representing each latent variable. To create the indicators, we used the averaged items of each subscale. Results indicate a good model fit:  $\chi^2_{[116]} = 256.45$ ,  $p < 0.001$ ; RMSEA = 0.044; 90% CI (0.036, 0.051); NFI = 0.96; CFI = 0.98; TLI = 0.98. All the standardised factor loadings were significant ( $p < 0.001$ ), varying in magnitude from 0.66 to 0.86. To further strengthen confidence in our measurement, we tested an alternative measurement model, in which all the second-order factors loaded on a single factor, by fixing their correlations to unity. The alternative model exhibited a poor fit to the data ( $\chi^2_{[119]} = 873.68$ ,  $p < 0.001$ ,  $d\chi^2/df = 7.342$ , NFI = 0.79, TLI = 0.79, CFI = 0.81, RMSEA = 0.136 (90% CI: 0.128; 0.145).

#### *Measurement equivalence*

Because the data were collected from two industries with different characteristics (Ettlie & Rosenthal, 2011), we followed Byrne's (2004) recommendation and conducted a multi-group CFA to test for measurement equivalence (i.e. factorial invariance) between the two sub-samples. This allowed us to assess whether employees from the two industries similarly interpreted our measurement model. First, we estimated a measurement model that included our three key variables and used it as a baseline model. Fit indices showed a good fit to the data,  $\chi^2_{[116]} = 256.45$ ,  $p < 0.001$ ; RMSEA = 0.044; 90% CI (0.036, 0.051); NFI = 0.96; CFI = 0.98; TLI = 0.98. Then we compared

this baseline (unrestrictive) model with another in which the factor loadings were constrained to be equal across the two groups/industries (manufacturing and services). To assess whether the factor structure was invariant across groups, we performed a chi-square difference test. But, since chi-square difference values are very likely to be significant in large samples (e.g. Byrne & Stewart, 2006; Chen, 2007), we also checked for differences in two goodness of fit indices (CFI and RMSEA). Chen (2007) suggested that a  $\Delta CFI$  ( $CFI_{restricted} - CFI_{unrestricted}$ )  $\leq -0.01$  and  $\Delta RMSEA \leq -0.015$  indicate invariance. As expected, the chi-square difference test found a small but significant difference ( $\Delta\chi^2_{[17]} = 41.69, p < 0.01$ ); however, the  $\Delta CFI$  and  $\Delta RMSEA$  were negligible ( $\Delta CFI = -0.003, \Delta RMSEA = 0.001$ ). Therefore, factor loadings are invariant across industries.

### ***Evaluation of common method variance (CMV)***

Since our research design is cross-sectional, we also tested whether common method variance poses a serious concern (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). To do so, we followed the recommendation of Johnson, Rosen & Djurdjevic (2011) and controlled for the effects of an unmeasured latent method construct (ULMC) representing the shared variance, by specifying it to load on all indicators. We then compared this model to another whose factor loadings were fixed to the values of the baseline model (the measurement model without the ULMC). The value of the chi-square difference test was insignificant, while those of the  $\Delta CFI$  and  $\Delta RMSEA$  were 0.001 and 0.004, respectively. Thus, the likelihood of CMV is negligible.

### **References**

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## **Online Appendix 2: Additional statistical analyses**

We ran four post-hoc analyses using the dimensions of employees' perceived job stressors (i.e. role ambiguity, conflict, workload, and inadequate resources) as dependent variables to see whether the interaction effects would hold in all dimensions. As shown in Table 3, for all dimensions, except role ambiguity, we found that employees' perceived EO had a negative impact. Furthermore, our data failed to provide support to the relationship between EO x HPWSs and each of the job stressor dimensions, with the exception of the conflict and inadequate resources dimensions; Here, we found significant interaction effect suggesting that the existence of HPWSs can further reduce the experienced conflict and the perceived resource inadequacy in firms with high EO. Also, for all four stressors, we found significant or marginally significant interaction effects between employees' EO perceptions and industry, effects which are very similar to those reported for the overall job stressors construct. In addition, the nature of the three-way interaction for all job stressors, with the exception of conflict, is comparable to that depicted in Figures 3a and 3b.

Table 3. Results of the hierarchical linear modelling analyses for each dimension of employees' perceived job stressors (role ambiguity, conflict, workload, and inadequate resources).

	Role ambiguity				Conflict			
	Model	Model	Model	Model	Model	Model	Model	Model
	1	2	3	4	1	2	3	4
Intercept	3.33***	3.33***	3.33***	3.33***	3.32***	3.32***	3.32***	3.32***
Level 2								
Predictor								
Firm age	-0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00
Firm size	-0.08	-0.08	-0.08	-0.08	-0.14	-0.14	-0.14	-0.14
(log)								
Industry	-0.08	-0.08	-0.08	-0.08	-0.43*	-0.43*	-0.43*	-0.43*
(IND)								
Level 1								
Predictors								
Gender	0.18*	0.17*	0.18*	0.18*	0.15†	0.13	0.14†	0.14†
Age	-0.04	-0.04	-0.04	-0.04	-0.00	-0.01	-0.00	-0.00
Tenure	0.08*	0.08*	0.09*	0.09*	0.03	0.03	0.04	0.04
Education	0.03	0.03	0.03	0.03	-0.04	-0.04	-0.04	-0.04
Position	0.01	-0.00	0.00	-0.00	0.08	0.05	0.06	0.06
EO	-0.03	-0.05	0.23	0.23	-0.32†	-0.38†	-0.13	-0.13
HPWS	-0.52***	-0.51***	-0.51***	-0.52***	-0.38***	-0.36***	-0.37***	-0.38***







Cross-level interactions									
EO x IND			-1.03*	-1.13*				-1.04†	-1.22*
HPWS x IND			0.22*	0.26*				0.08	0.16
EO x HPWS x IND				0.22*					0.40**
Pseudo R <sup>2</sup> (%)	7.87	8.18	9.42	9.98	7.43	7.72	8.34	9.86	
Deviance	2051.11	2049.29	2042.07	2038.84	2195.28	2193.59	2189.98	2181.16	
Δdeviance (as $\chi^2$ )	55.38***	1.82	7.22*	3.24†	49.56***	1.69	3.61	8.82**	

Notes: N(level 1) = 636, N(level 2) = 58. The deviance test for Model 1 is based on the comparison with an intercept only model. Unstandardised coefficients are reported. Full maximum likelihood estimator. Pseudo R<sup>2</sup> values account for the total variance (level 1 and level 2).

\*\*\*p < 0.001, one-tailed; \*\*p < 0.01, one-tailed; \*p < 0.05, one-tailed; †p < 0.1, one-tailed

As an additional analysis, instead of using the unidimensional measure of employees' perceived EO in our multi-level model as an independent variable, we included its three dimensions (i.e. innovativeness, risk-taking, and proactiveness). For

hypothesis 1 (i.e. employees' perceived EO and job stressors are negatively related), the risk-taking dimension had a negative relationship with job stressors. For hypothesis 2 (i.e. relationship of employees' perceived EO with job stressors depending on employees' perceptions of HPWSs), all three interaction terms (see Table 4, Model 3) were insignificant and consistent with what we report in Table 2. With regard to hypothesis 3 (i.e. the relationship of employees' perceived EO with job stressors according to industry), the results (see Table 4, Model 3) revealed that, depending on the industry, all three dimensions of employees' perceived EO displayed similar behaviour to that of the unidimensional construct. Interestingly, in Model 4 (Table 4), which tested our fourth hypothesis (i.e. the relationship of employees' perceived EO with job stressors depending on the industry and HPWSs), our results highlight the employees' perceived risk-taking dimension as the strongest predictor of job stressors according to industry and the perceived HPWSs. Specifically, as we found for the unidimensional construct of employees' perceived EO, among those who work in manufacturing firms, a perceived risk-taking orientation of their organisation has a negative impact on job stressors, but is less intense when HPWSs are considered high. In contrast, among those working in service firms, a risk-taking perceived orientation by the employees has a positive relationship with job stressors, irrespective of the level of HPWSs.

Table 4. Results of the hierarchical linear modelling analysis using the dimensions of EO (innovativeness, risk-taking, proactiveness) on job stressors.

	Job stressors			
	Model 1	Model 2	Model 3	Model 4
Intercept	3.41***	3.41***	3.41***	3.41***
Level 2 Predictor				
Firm age	-0.00	-0.00	-0.00	-0.00
Firm size (log)	-0.18	-0.18	-0.18	-0.18
Industry (IND)	-0.30*	-0.30*	-0.30*	-0.30*
Level 1 Predictors				
Gender	0.05	0.03	0.05	0.06
Age	-0.02	-0.02	-0.02	-0.02
Tenure	0.04†	0.04†	0.05†	0.05*
Education	0.01	0.01	0.01	0.01
Position	0.04	0.03	0.04	0.03
Innovativeness (I)	0.02	0.02	0.11	0.11
Risk-taking (R)	-0.21*	-0.22**	-0.12†	-0.14†
Proactiveness (PR)	-0.08	-0.09	0.02	0.02
HPWS	-0.42***	-0.41***	-0.43***	-0.43***
I x HPWS		0.02	0.03	0.03
R x HPWS		-0.00	-0.02	-0.04
PR x HPWS		0.04	0.06	0.05

Cross-level interactions

I x IND			-0.30*	-0.36*
R x IND			-0.29†	-0.35*
PR x IND			-0.60***	-0.64***
HPWS x IND			0.14†	0.19*
I x HPWS x IND				0.09
R x HPWS x IND				0.26**
PR x HPWS x IND				-0.04
Pseudo $R^2$ (%)	15.67	15.94	18.23	19.91
Deviance	1749.16	1747.57	1734.21	1724.42
$\Delta$ deviance (as $\chi^2$ )	102.85***	1.59	13.36*	9.79*

Notes: N(level 1) = 636, N(level 2) = 58. The deviance test for Model 1 is based on the comparison with an intercept only model. Unstandardised coefficients are reported. Full maximum likelihood estimator. Pseudo  $R^2$  values account for the total variance (level 1 and level 2).

\*\*\* $p < 0.001$ , one-tailed; \*\* $p < 0.01$ , one-tailed; \* $p < 0.05$ , one-tailed; † $p < 0.1$ , one-tailed

***Robustness check***

Our results (Table 2) indicate that most level-1 and level-2 control variables had marginally significant or insignificant relationships with most employees' perceived job stressors. To increase our confidence in the findings, we performed further post-hoc analyses. Thus, we ran additional models that excluded some or all level-1 and level-2 control variables. Results indicated that their presence did not substantially change the pattern of the results.