



Contents lists available at ScienceDirect

European Management Journal

journal homepage: www.elsevier.com/locate/emj

Employees' perceptions of high-performance work systems and innovative behaviour: The role of exploratory learning

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ARTICLE INFO

Article history:

Received 3 July 2015

Received in revised form

19 October 2016

Accepted 29 November 2016

Available online xxx

Keywords:

High-performance work systems

Innovative behaviour

Exploratory learning

Partial least squares

ABSTRACT

This paper analyses the influence of employees' perceptions of high-performance work systems (HPWSs) on employees' exploratory learning and innovative behaviour. Furthermore, the mediating role of exploratory learning in this relationship has also been studied. To achieve these objectives, a quantitative analysis was conducted with a sample of 304 researchers from the Spanish public sector. Results showed the relevance of employees' perceptions of HPWSs in promoting exploratory learning and employees' innovative behaviour. The mediating role of exploratory learning in the relationship was assessed. The paper mentions the importance of workers' perceptions on the implementation of HPWSs and their impact on employees' behaviour. The paper also presents practical and theoretical implications.

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1. Introduction

The human resource management (HRM) literature has focused on examining the relationship between HRM practices, which are considered as a system, and organisational performance (Huselid, 1995) from a macro perspective. However, the literature does not clearly address how HRM practices affect performance outcomes (Den Hartog, Boon, Verburg & Croon, 2013). To this end, researchers have increasingly adopted a micro perspective to disentangle the mechanisms through which this relationship is established (Kehoe & Wright, 2013; Nishii, Lepak, & Schneider, 2008). From this micro viewpoint, employees' reactions (attitudinal and behavioural responses) to HRM practices have been analysed (Baluch, Salge, & Piening, 2013; Katou & Budhwar, 2010; Nishii et al., 2008) and are seen as the means through which this relationship is established. It transpires that employees' reactions play an essential role in explaining this relationship, and consequently some authors emphasise the need to include employees' perceptions in HRM research (Bowen & Ostroff, 2004; Kehoe & Wright, 2013; Nishii & Wright, 2008; Van De Voorde & Beijer, 2015).

Chang (2005) defines employees' perceptions of HRM practices as the expression of the beliefs an employee experiences about

these practices in an organisation. Although employee reactions and perceptions are seen to be central in clarifying the mediating mechanism in the HRM practice–performance relationship, this relevance is not evident in empirical research (Nishii & Wright, 2008; Wood, 2009, pp. 55–74). Following the above arguments, this paper focuses on employees' perceptions of HRM practices as more proximal predictors of individual attitudes and behaviours (Khilji & Wang, 2006; Nishii et al., 2008). Analysing employees' perceptions provides a framework for studying how employees experience or perceive the high-performance work systems (HPWSs) implemented by managers and how the former influences individual attitudes and behaviours (Alfes, Shantz, Truss, & Soane, 2013).

The research presented here focuses on innovative behaviour (IB) as a particular kind of individual behaviour, which is of great significance to organisational effectiveness, efficacy and survival (Scott & Bruce, 1994; West, Hirst, Richter, & Shipton, 2004). Employees' IB refers to the ability of individuals to generate new ideas and viewpoints, which are subsequently transformed into innovation. Bearing in mind that the creation of innovation lies in ideas and how individuals develop them, an analysis of the aspects that facilitate IB becomes critical. In this regard, some studies have focused on the influence of factors, such as the role of supervisor support (Dysvik, Kuvaas, & Buch, 2014; Janssen, 2005; Yuan & Woodman, 2010), work characteristics (Farr & Ford, 1990, pp. 63–80; Oldham & Cummings, 1996), and organisational climate

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and culture (Scott & Bruce, 1994). Nevertheless, there is scarce empirical evidence to explain how several aspects of individual and contextual nature (e.g. employees' perceptions of HRM practices) may have an effect on employees' IB (Shalley, Zhou, & Oldham, 2004).

Another relevant issue for IB is exploratory learning. Exploratory learning is a type of individual learning composed of two complementary dimensions: information acquisition and information interpretation (Flores, Zheng, Rau, & Thomas, 2012). From a conceptual perspective, exploration implies the generation of new ideas through an active search for viewpoints, alternatives and different perspectives (Danneels, 2002). Therefore, the implementation of some HRM practices and how they are perceived by employees will foster their exploratory learning and, consequently, their innovations (Shipton, West, Dawson, Birdi, & Patterson, 2006).

Taking into account the aforementioned arguments, this manuscript contributes to the literature by adopting a two-fold approach and analysing new unexplored relations based on two basic arguments: first, IB and exploratory learning are triggered through employees' perceptions of HPWSs and, second, exploratory learning is a *sine qua non* condition for employees' IB. Thus, considering these preliminary arguments, the following basic goals for the research presented here are as follows. The first aim was to explore whether employees' perceptions of HPWSs are linked to IB and exploratory learning, whereas the second aim was to analyse the mediating role of exploratory learning in the relationship between employees' perceptions of HPWSs and IB.

The results obtained contribute to the literature on learning and innovation micro-foundations, showing the relevance of employees' perceptions of HPWSs to exploratory learning and IB. In addition, the results contribute to this literature by establishing that the existence of exploratory learning is a necessary condition for IB and that HPWSs clearly stimulate the existence of exploratory learning at an individual level. Consequently, managers should design HRM practices to facilitate an exploratory learning context and process if organisational strategic goals are to be based on the achievement of IB. The existence of this particular context and of individual IB plays a vital role in organisations, such as universities and research centres, where innovation is a way of transferring (e.g. through cooperation agreements) the knowledge they develop to companies. Individuals working in research centres and universities constitute our research sample.

2. Theoretical review

2.1. Perceptions of HPWSs and employees' IB

Traditional literature on HRM has focused on the analysis of HRM practices and performance from different perspectives. One of the most outstanding approaches is the system approach (Combs, Liu, Hall, & Ketchen, 2006; Delery & Doty, 1996). Under this viewpoint, the joint consideration of some sets of HR practices results in superior performance than other alternative perspectives (e.g. individual practice approach; see Combs et al., 2006). In this regard, Boxall, Ang, and Bartram (2011) highlighted the fact that these practices must be considered together as some of them have an influence on others. For example, selection or career development is related to training as sometimes a new employee requires particular preparation and cultural indoctrination to adapt him to the new job specifications (in some specific jobs, general knowledge or skills are not enough to perform it correctly). These sets or configurations of practices have been labelled as high-performance or high-commitment practices (HPWSs) in the specialist literature and are designed to promote employees' skills and behaviours (Huselid, 1995; Way, 2002) to achieve organisational strategic

goals. The work presented here is based on this approach.

Despite a lack of agreement in the specialist literature about how to accurately define HPWSs (Arthur, 1994; Huselid, 1995) and the HR practices contained in them (Boxall & Purcell, 2008), numerous important studies on the topic suggest that HPWSs are a bundle of practices that normally include and refer to selection, training, career development and motivation practices, such as performance appraisal, pay for performance and job security.

The effect of HR practices on employees' attitudes and behaviours becomes a chain of successive effects (Boxall, 2012). First, such practices need to be formulated by managers and will subsequently have to be implemented throughout the organisation. However, the formulation and implementation of these practices are not going to guarantee the 'expected' result on employees if they are not correctly perceived. Therefore, perception plays a primary role when we are talking about modifying individual attitudes, behaviours and outcomes (Takeuchi & Takeuchi, 2013).

To this respect, Shen et al. (2014) following the social exchange theory, which proposed a direct relationship between perceived organisational support and organisational outcomes (particularly organisational citizenship behaviour and work performance). Their results showed that if employees perceive that their goals are taken into account, they will be more productive and reduce their absenteeism. In turn, Greco, Cricelli, and Grimaldi (2013) and Accard (2015) showed the relevance of perceptions on performance evaluation and results. Similarly, bounded rationality and rational choice theory explain that perceptions are influenced by our background and cognitive limitations, making us interpret some HR practices in different ways. Consequently, our perceptions make us evaluate a situation in a specific way and influence our behaviour.

When relating perceptions to HR practices, authors such as Agarwala (2003) or Alfes et al. (2013) highlighted that there are few studies analysing how individuals experience the interventions suggested by HRM. More specifically, employees' attitudes and behaviours in a response to the HRM system depend on how individuals perceive the practices in their working context (Bowen & Ostroff, 2004) rather than on what a manager says has been implemented. Accordingly, some studies showed that employees' perceptions of HRM practices are significantly different from the reports of the practices actually used by the firm (Liao, Toya, Lepak, & Hong, 2009). Farooq, Farooq, and Jasimuddin (2014) also showed the relationship between employee perceptions of corporate social responsibility (understood as some HR actions that send signals of recognition, such as extensive training, participation in decision-making and pay for performance) and knowledge-sharing behaviour. This article suggests that specific HR practices send clear signals that the organisation values its employees. Therefore, they feel confident and change their attitudes and behaviours, contributing to organisational performance. Again, the role of perceptions becomes crucial in this change.

Conversely, researchers have analysed the effects of HPWSs on different kind of outcomes such as profitability and productivity, financial performance, commitment and satisfaction (Huselid, 1995; Verborg, Den Hartog, & Koopman, 2007), or, more recently, innovation performance (Beugelsdijk, 2008; Lau & Ngo, 2004). However, specialised literature draws attention to the analysis of the effects of HPWSs on employees' behaviour (Grant & Shields, 2002; Kehoe & Wright, 2013; Macky & Boxall, 2007). Therefore, in line with our research aims, we focused on the effect of the perceptions of HPWSs on a particular behaviour, in this case, IB. In this regard, we considered innovation from a behavioural perspective (Janssen, 2001; 2005) and defined IB as 'all the behaviours through which employees can contribute to the innovation process', particularly focusing on behaviours oriented towards the generation and application of ideas (De Jong & Den Hartog,

2007:43).

Consequently, the fact that employees adopt innovation-oriented behaviour becomes a key matter when analysing the relationship between HPWSs and performance. Combs et al. (2006) stated that HPWSs affect organisational performance through three different mechanisms: (a) an increase in employees' knowledge and skills, (b) an increase in employees' actions and (c) the motivation of employees to exhibit such behaviours (Becker, Huselid, Pickus, & Spratt, 1997; Delery & Shaw, 2001). These three aspects also have an influence on employees' discretionary behaviour, creativity and productivity (Becker et al., 1997) and, consequently, on their IB. The logic underlying this link between these three mechanisms and IB is based on the Ability-Motivation-Opportunities framework (Appelbaum, Bailey, & Griffeth, 2000; Boxall, 2012). In this respect, training is necessary because employees have to acquire the *abilities* to exchange knowledge or analyse problems in a different way. In addition, the organisation has to create a suitable environment for the process of the creation of new ideas to take place (*opportunity*), for example, with more autonomy and with resources to implement these new ideas. Finally, proper recognition of the value created by employees and feeling responsible for the innovation process will generate the required intrinsic and extrinsic *motivation* that will lead to IB.

At an individual level, insights from the social exchange theory (Eisenberger, Fasolo, & Davis-LaMastro, 1990; Rhoades & Eisenberger, 2002) implicitly posit that HRM promotes discretionary behaviours that are conducive to innovation (Hayton, 2004), as has been mentioned before. However, surprisingly, few studies have empirically analysed the relationship between employees' perceptions of HPWSs and IB at an individual level. Recently, however, new research has started to focus on the study of the perceptions of HPWSs and IB at individual level. In this regard, Bednall, Sanders, and Runhaar (2014) confirmed that the quality of some HRM practices (mainly, performance appraisal) positively influences the level of knowledge sharing and employees' IB. In addition, Kuvaas and Dysvik (2010) demonstrated that employees' perceptions of HPWSs led them to show higher task-related performance and greater organisational citizenship behaviour and made them less prone to quit.

Consequently, we argue that employees' perceptions of HPWSs influence their attitudes and behaviours (Takeuchi, Chen, & Lepak, 2009), particularly their IB (Fu, Flood, Bosak, Morris, & O'Regan, 2015). Considering the arguments in the above paragraphs and the fact that no previous research has yet analysed employees' perceptions of HPWSs as drivers of IB, we put forward the following hypothesis:

H1: Employees' perceptions of HPWSs positively affect their IB

2.2. Employees' perceptions of HPWSs and their impact on exploratory learning and IB

2.2.1. Employees' perceptions of HPWSs and exploratory learning

There is no consensus in the specialist literature for defining exploratory learning or the terms used to refer to it (e.g. authors such as Danneels (2002) refer to it as explorative learning). In addition, literature has studied exploratory learning from an organisational perspective, considering it as a capability or competence developed by the firm (Danneels, 2002; McGrath, 2001). However, in this work, we aimed to analyse exploratory learning from an individual perspective.

According to Danneels (2002), exploratory learning is linked to the ability to identify, evaluate and incorporate new knowledge and new competences into the firm. This definition focuses on one of

the two modes or types of learning defined by March (1991), namely, exploration. Similarly, this orientation to explore new ideas and perspectives as a way of learning was expressed by Crossan, Lane, and White (1999) through their model of learning based on the 4Is (intuition, interpretation, integration and institutionalisation), where intuition and interpretation are stages that exist at an individual level.

In turn, McGrath (2001) states that exploratory learning requires variety seeking to obtain more novel knowledge and novel routines. In this vein, Shipton et al. (2006:5) established that exploratory learning 'represents a concern with exploration, with identifying new and different opportunities for the future'. This exploration is the result of contact with different points of view from the outside and also in part because knowledge is shared and distributed within the organisation. This exploration leads individuals to question their mental models and make them more likely to challenge the status quo (Shipton et al. (2006:5).

Because much of the literature on organisational learning agrees on the individual nature of learning (Bontis, Crossan, & Hulland, 2002) and individuals are the ones who learn and not organisations (Miner & Mezas, 1996), we considered that exploratory learning is an individual process oriented to the search (exploration) for new ideas and perspectives. Therefore, in line with Flores et al. (2012), we defined exploratory learning as a type of individual learning based on two individual subprocesses: information acquisition and information interpretation. Information acquisition refers to the process through which an individual acquires new information from internal or external sources (Huber, 1991; Leonard-Barton, 1992), whereas information interpretation is linked to the process through which individuals make sense of new information that they have acquired (Levinthal & March 1993) to convert it into new individual knowledge (Crossan et al., 1999).

Some studies (Chen & Huang, 2009; Minbaeva, Foss, & Snell, 2009) have evidenced a clear relationship among HRM practices and some knowledge management processes (knowledge creation and transfer) and absorptive capacity processes. In addition, Pérez, Montes, and Vazquez (2006) showed a positive relationship between some HRM practices and organisational learning. Similarly, Jerez, Cespedes, and Valle (2004) established a positive relationship between a set of training practices and organisational learning capability, particularly with the factor measuring the degree of openness and experimentation (this factor is similar to our idea of exploratory learning). Therefore, the role of HRM practices as a precursor of learning processes is clear. In this regard, Patel, Messersmith, and Lepak (2013) stated that by carefully matching individuals to jobs and training them to perform their tasks correctly, an organisation may allow more time for exploratory activities. In addition, additional time resources, promotion of advancement opportunities, job security provisions and development of participation and information-sharing mechanisms will contribute to generate a more participative organisational context through which employees may create more innovative solutions (Patel et al., 2013, p. 1424).

Given that HRM is a crucial mechanism through which organisations can exert influence on such individual-level conditions and processes (Minbaeva, Mäkelä, & Rabbiosi, 2012), a better understanding of how and why HRM practices affect employees' exploratory learning is required.

As a consequence of the arguments mentioned above, we posited the following hypothesis:

H2: Employees' perceptions of HPWSs positively affect exploratory learning

2.2.2. Exploratory learning as a mediator of the relationship between employees' perceptions of HPWSs and IB

In the previous section, we established that HPWSs have a direct influence on exploratory learning. As we have already mentioned, the exploration process is characterised by risk-taking, experimentation and employee flexibility to discover new and different phenomena of interest (Shipton et al. 2006; West, 2002) and new ideas and perspectives. If IB includes the generation (or adaptation) of novel solutions to problems and the application of new approaches to the organisation (Scott & Bruce, 1994), exploratory learning will be directly linked to employees' IB. Consequently, exploratory learning becomes an antecedent or determinant of employees' IB.

Shipton et al. (2006) foreground the relevance of HPWSs to promote exploratory learning as a predictor of innovation performance by studying this relationship from an organisational level. In their work, these authors highlighted the relevance of employees' exploratory learning through the acquisition of potentially applicable knowledge and skills, and doing so facilitates innovation. Thus, the results of their study emphasise how HPWSs could affect the exploratory approach of employees and foster innovation performance.

From the ideas mentioned above, we argue that the joint implementation of a set of practices related to training, promotion, participation, rewards and safety at work will encourage exploratory learning based on the adoption of new viewpoints, risk-taking and flexibility, which in turn will lead to greater employee orientation towards innovation. Employees are more likely to take risks and experiment with new ways of doing things, thus becoming more committed, when they perceive that they have easy access to the training they need and that has been suggested by themselves, when they know that the company ensures their training needs are met, when they perceive that their work is recognised and they are compensated adequately, when they know there are promotion opportunities available in the company, when they can work and make decisions independently, and when they feel that their position in the company is secure. Consequently, more exploratory learning will occur and therefore result in greater IB.

Consequently, we assert that exploratory learning mediates the relationship between employees' perceptions of HPWSs and IB. Therefore, we propose the following hypothesis:

H3: Exploratory learning will mediate the relationship between employees' perceptions of HPWSs and IB

3. Research methodology

3.1. Sample and data collection

To achieve the proposed objectives and test the hypotheses formulated previously, a quantitative methodology was applied. Data were obtained from researchers working at a Spanish university and from research institutes belonging to the same university, forming our research population. Our hypotheses were tested in a knowledge-intensive context given that university researchers are considered to be knowledge workers who provide education and research services (Evanschitzky, Ahlert, Blaiich, & Kenning, 2007) to firms and society in general. These kinds of professionals need to continuously innovate to adapt the way that they build and transfer knowledge to create and develop research projects that will turn into innovation projects for firms. Spanish universities have explicitly introduced the use of a bundle of HR practices (specific training, career development, research funding and promotion, and performance appraisal systems that consider

research activities and results) in their strategic plans (e.g. the University of Valencia) to encourage learning and innovation. Moreover, several works show the relevance of HRM activities in a university context (Pearce & Randel, 2004; Yousaf, Huadong, & Sanders, 2015). The latter study specifically analyses how motivational practices influence performance in a similar context (faculty members). Consequently, studying the perception of HR actions, exploratory learning and IB in a university context is relevant.

The questionnaire was sent to 2469 employees, resulting in a final sample of 304 valid questionnaires with a response rate of 12%. Participation was voluntary for all employees, and confidentiality was assured. The questionnaire was sent by e-mail as all employees had access to computers. The e-mail contained additional information to motivate and inform the respondent about the questionnaire. Data were collected between December 2013 and October 2014. Non-response bias was checked, considering the low response rate. A comparison was made to establish whether the differences in demographic variables (gender and level of education) between the sample and population were significant. We used chi-square statistic to test the null hypothesis (identical distribution for the control variables). The values of chi-square showed no significant differences (education: $\chi^2 = 2.77$; gender: $\chi^2 = 2.38 < \chi^2_{1,0.05} = 3.83$), thus accepting the null hypothesis and increasing our confidence in the representativeness of the sample.

A descriptive analysis showed that employees had been in the workplace (tenure) for an average of 13.8 years [standard deviation (SD): 9.91] and that 49.3% of the sample were men and 50.7% were women (SD: 0.5). In terms of educational level, 65.5% had doctoral studies, 7.5% had a Master's degree and 27% had a Bachelor's degree or less (SD: 0.94). The professional situation in the university hierarchy of those participating revealed that 73.7% were professors and researchers, 19.7% were technical researchers and 6.6% were trainee research staff (SD: 0.59).

3.2. Measurement scales

The proposed scales were adapted from the previous literature. The survey used was initially created in English and then translated into Spanish following Brislin's established procedures (1980) to ensure the accuracy of the original scales and items. A seven-point Likert scale was used, ranging from 'strongly disagree' to 'strongly agree'.

3.2.1. Innovative behaviour

The scale was adjusted from the one developed by Scott and Bruce (1994). A sample of the items used is as follows: I generate creative ideas; I investigate and obtain the necessary funds to apply new ideas and develop plans and programs for the implementation of these new ideas. The value for internal consistency was 0.83.

3.2.2. Exploratory learning

Exploratory learning is an adaptation of the proposed scale included in the work of Flores et al. (2012). Eight items explicitly referring to exploratory learning were selected, four items related to the acquisition of information (internal consistency: 0.725) and four items on the interpretation of that information (internal consistency: 0.803), which are sub-processes within the learning process that form part of the concept 'exploratory learning'.

3.2.3. High-performance work systems

The scale consisted of 17 items and was validated with our sample. These included five sub-scales referring to five key HR practices: training and development (four items, internal consistency: 0.85), pay for performance (four items, internal consistency: 0.776), career development (three items, internal consistency:

0.799), participation in decision-making processes (four items, internal consistency: 0.848) and job security (two items, internal consistency: 0.873). This measure was based on the scales developed by Sun, Aryee and Law (2007), Vandenberg, Richardson, and Eastman (1999), and Gaertner and Nollen (1989). Particularly, training and development and pay for performance were derived from the scale by Vandenberg et al. (1999), which were later reviewed in the work of Riordan et al (2005); participation and job security were derived from the scale by Sun et al. (2007); and career development was based on the work of Gaertner and Nollen (1989). Each of these sub-scales adds some key HRM practices that are relevant for the characteristics of the sample analysed. However, we did not consider practices such as selection in our scale because these processes are highly affected by governmental regulation in the context where the research has been conducted.

It is noteworthy to state that the measures we have used are perceptions of the effects of HRM systems. We asked the individuals to score the extent to which the application of some HRM practices affect their behaviour.

The control variables used were educational level (Dummy_1: 1 = degree level, 0 = other higher studies; Dummy_2: 1 = PhD level, 0 = other lower studies), gender (1 = male; 0 = female) and tenure in the organisation. The inclusion of these variables is based on previous studies as they can have an impact on the perception of HPWSs (Alfes et al., 2013; Dysvik, Kuvaas, & Buch, 2014) and on IB (Janssen, 2005; Scott & Bruce, 1994).

4. Data analysis

4.1. Descriptive analysis

Table 1 shows mean, SD and the correlations for each variable used in this study. The correlations between IB, HPWSs and exploratory learning were in the expected direction, i.e. they were positive and significant ($p < 0.01$). In terms of the correlations between constructs and control variables, significant correlations were found between some key study variables and some control variables.

4.2. Evaluating the measurement model

The structural model was estimated through partial least squares path modelling (PLSPM) using SmartPLS 3.2. Our study used reflective constructs. Employees' perceptions of HPWSs and EL were measured as second-order variables; however, IB was measured as a first-order factor.

Measurement model properties were evaluated according to Hair, Sarstedt, Ringle, & Mena's (2012) recommendations for PLSPM. All indicators were significantly associated with their respective constructs ($p < 0.01$) with standardised loadings >0.7 (Barroso, Carrión, & Roldán, 2010), proving high indicator reliability. Table 2 shows values for internal consistency and

discriminant validity. To assess internal consistency, Cronbach's alpha, composite reliability (CR) and average variance extracted (AVE) were used. All constructs had alpha values > 0.7 , and the CR values of the constructs ranged from 0.89 to 0.90, which were all greater than the threshold of 0.7 (Bagozzi & Yi, 1988). The AVE values for each construct were ≥ 0.50 threshold (Fornell & Larcker, 1981), confirming the convergent validity of the measurement model.

Finally, Fornell and Larcker's (1981) procedure was used to test discriminant validity issues. As shown in Table 2, the AVE values were greater than the squares of the correlations between each pair of factors. We also checked that each item had a greater load on the factor it measured than its cross-loadings with the rest of the latent variables (Henseler, Ringle, & Sinkovics, 2009).

Podsakoff and others' (Podsakoff, MacKenzie, Lee & Podsakoff, 2003) recommendations were followed to assess common method variance, and Harman's single-factor test was used to analyse potential biases. Results showed that the variance explained by this factor was $<30\%$; according to Harman's test, our study does not show problems arising from common method bias.

4.3. The structural model

Predictive relevance of the two dependent variables of the model was assessed using Stone-Geisser's Q^2 (Geisser, 1975; Stone, 1974), which can be measured using blindfolding procedures. As shown in Table 3, all dependent latent variables exhibited a $Q^2 > 0$, suggesting the predictive relevance of the model (Chin, 1998, pp. 295–358). A power analysis was performed using G*Power 3 (Faul, Erdfelder, Buchner, & Lang, 2009) to test whether our sample assured a power for the R^2 deviation from zero test $>80\%$. The achieved power was $>96\%$.

The R^2 value of the dependent latent variables was used to determine the amount of variance explained by the model (see Table 3). According to Falk and Miller (1992), this index must be > 0.1 . As shown in Table 3, although R^2 for IB reached this threshold ($R^2 = 0.10$), exploratory learning R^2 is smaller ($R^2 = 0.04$). However, as Hair et al. (2012) indicated, acceptable R^2 depends on the research context, and it can be assumed that many other determinants of exploratory learning are external to our model.

Table 2
CR, AVE and squared correlations between factors.

CR	0.89	0.90	0.88
CA	0.83	0.74	0.78
AVE	F.1	F.2	F.3
1. Innovative behaviour	0.66		
2. HPWSs	0.06	0.50	
3. Exploratory Learning	0.30	0.04	0.83

Note: CR (shown in the first row of the matrix); AVE (shown in bold in the diagonal of the matrix); the rest of the numbers show the squared correlations between factors.

Table 1
Mean, standard deviations and correlations among study variables.

	Mean	SD	1	2	3	4	5	
1. IB	5.03	1.24						
2. HPWSs	4.44	1.09	0.24**					
3. Exploratory learning	5.70	0.75	0.55**	0.21**				
4. Gender	0.49	0.50	0.03	0.10	0.01			
5. Tenure	13.80	9.91	0.03	0.25**	0.06	0.09		
6. D_1	0.26	0.44	-0.15**	-0.07	-0.06	-0.18**	-0.31**	
7. D_2	0.66	0.47	0.16**	0.09	0.06	0.17**	0.40**	-0.84**

Note: To calculate the correlation coefficients, the mean of the items that made up each dimension was used. ** $p < 0.01$.

Table 3
Results supporting H1 and H2.

Relationships proposed	Estimate	t-value
H1: HPWSs–IB	0.25***	4.18
H2: HPWSs–Exploratory Learning	0.20***	3.26
R ² (IB) = 0.10; R ² (EL) = 0.04/Q ² (IB) = 0.04; Q ² (EL) = 0.02		

Note: ***p < 0.001. None of the control variables showed significant influence on the dependent variables.

5. Results

SmartPLS 3.2 (Ringle, Wende, & Becker, 2015) was used to test the hypotheses proposed in our model and Preacher and Hayes' (2004; 2008) recommendations were followed to test mediation. Bootstrapping was used to generate standard errors and t-statistics.

Table 3 shows the results for hypotheses 1 and 2. The first hypothesis proposed a positive effect of employees' perceptions of HPWSs on IB. The results showed that employees' perceptions of HPWSs had a positive and significant effect on IB ($r = 0.25$; $p < 0.00$), thus supporting H1. Hypothesis 2 suggested that employees' perceptions of HPWSs positively influence exploratory learning. Results show that employees' perceptions of HPWSs had a positive and significant effect on exploratory learning ($r = 0.20$; $p < 0.00$). Thus, our second hypothesis is also supported.

To test the third proposed hypothesis (H3: exploratory learning will mediate the relationship between employees' perceptions of HPWSs and IB), a mediation analysis was developed to study the effect of exploratory learning on the relationship between employees' perceptions of HPWSs and IB. The first condition for mediation to take place is the existence of a positive and significant effect in the direct model (employees' perceptions of HPWSs and IB). Results from the direct model showed the existence of a direct relationship ($\beta = 0.25$ $p < 0.001$); therefore, the first condition for mediation was met. Following Preacher and Hayes' (2004; 2008) approach, the sampling distribution of the indirect effect was bootstrapped (5000 samples). Results showed a significant indirect effect ($\beta_{\text{HPWSs}} \cdot \beta_{\text{EL}} = 0.11$; $t = 3.23$, $p < 0.00$). The smaller significant link between HPWSs and IB and a variance accounted for (VAF) of 50% confirmed the partial mediating role of exploratory learning. Table 4 summarises the mediation analysis performed in this paper.

6. Discussion and conclusions

The study of employees' IB has become crucial in recent years as IB contributes to attain organisational success through the generation of new and useful ideas, which are transformed into new and better products, services and work processes (De Jong & Den Hartog, 2007). Individuals initiate and develop the innovation process. Consequently, it is of primary importance to study which individual factors foster IB. Thus, the aim of this article centred on studying to what extent employees' perceptions of HPWSs are

related to individual exploratory learning and IB, trying to reveal the mediating function of exploratory learning in this relationship.

Our first hypothesis posed the positive influence of employees' perceptions of HPWSs on IB. In this respect, our empirical results confirmed this hypothesis in line with some previous theoretical (Hayton, 2004) and empirical (Bednall et al., 2014; Beugelsdijk, 2008; Laursen & Foss, 2003) studies. However, as opposed to previous works, which focused on the study of single practices (e.g. performance quality appraisal; Bednall et al., 2014) or adopted an organisational perspective (Beugelsdijk, 2008; Laursen & Foss, 2003), our study analysed the link between HPWSs and IB from an individual viewpoint and considered the systemic nature of HPWSs. Our research has specifically revealed that when employees perceive HRM practices as being motivating and feel that these practices contribute to offer them the opportunity to develop professionally and feel safe and confident, they will be more likely to accept risks and apply new ideas, that is, to orient their behaviour towards innovation.

Our second hypothesis proposed a positive and significant effect of employees' perceptions of HPWSs on exploratory learning. The previous literature studied HPWSs as an antecedent of a certain kind of knowledge variables (Chen & Huang, 2009; Minbaeva et al., 2009). However, as we stated before, very few studies have analysed the relationship between employees' perceptions of HPWSs on learning variables at individual level (Minbaeva et al., 2012), particularly on exploratory learning. Only the study by Shipton et al. (2006) suggested the existence of a relationship between exploratory learning and HRM practices from a macro perspective; however, they analysed the effect of exploratory learning on these practices from a single perspective (not as a system). Thus, this research contributes to the HRM and learning literature showing that employees' perceptions of the HRM practices implemented in the firm and considered as a system positively affect individual exploratory learning. Consequently, this individual learning-oriented process may be fostered when correctly combined with HRM practices.

Our results also supported the third hypothesis, which put forward the mediating effect of individual exploratory learning in the relationship between HPWSs and IB. Shipton, Sanders, Bednall, Lin, and Escribá-Carda (2015) theoretically proposed that exploratory learning could be considered as an antecedent of IB. Furthermore, based on an organisational perspective, a similar study by Shipton et al. (2006) considered how HRM practices promoting exploratory learning were related to technical and product innovation. Nevertheless, the concept of exploratory learning was not explicitly tested in their study. Therefore, the contribution of our research lies in explicitly analysing the intermediate role of individual exploratory learning between employees' perceptions of HPWSs and IB. Moreover, our results confirmed the existence of partial mediation. This fact implies that the development of exploratory learning in individuals is a necessary condition for IB to take place, and HPWSs clearly stimulate the existence of exploratory learning at individual level, which, in turn, generates innovation-oriented behaviour.

Table 4
Mediation effect testing

Model	Relationships proposed	Parameter identification	Standardised path coefficients	t-value (Bootstrap)
A	HPWSs–IB	c'	0.25***	4.18
B	HPWSs–IB	c	0.12*	2.20
	HPWSs–Exploratory Learning	a	0.20***	3.49
	Exploratory Learning–IB	b	0.54***	11.64
	Indirect Effect	a × b	0.11***	3.23

Note: Model A = only direct effect of HPWSs on IB; Model B=Full model, HPWSs on IB controlling by EL. *p < 0.05; ***p < 0.001; VAF=(a × b)/(a × b + c) = 0.50. R² (IB) = 0.35.

6.1. Theoretical and practical implications

Considering the implications, this manuscript provides a different vision of the analysis of HPWSs from a theoretical perspective. It specifically puts the emphasis on the individual level and focuses on analysing employees' perceptions of how HPWSs have been applied. The study of the link between HPWSs and IB from an individual point of view may pave the way to future research on the micro and subjective nature of learning and the effect that HPWSs may have on it.

The analysis of the effect of HPWSs based on the responses of managers (intended practices) has been widely criticised due to its subjective nature (Arthur & Boyles, 2007). However, this paper places the emphasis on how employees perceive the application of these practices in their working context, thus overcoming this drawback to a certain extent. By studying employees' perceptions of HPWS implementation, we took a step further by focusing on the receivers of managerial actions. Measuring exploratory learning and showing its mediating role between the perceptions of HPWSs and IB are also other important theoretical contributions.

Furthermore, the results of our work have implications from a practical perspective. HPWSs containing practices such as training, promotion, participation, rewarding and safety at work will foster the orientation towards the acquisition of new knowledge and learning from others, which will contribute to the introduction of new perspectives in the firm by developing active IB in employees.

In addition, our work has revealed that top managers must give importance not only to the application of HPWSs but also to how such practices are perceived by employees. This means that an effective HRM strategy for innovation needs to be correctly designed by managers (intentions) and adequately perceived by employees (perceptions). This fact implies that the measurement of HPWS effectiveness could be expressed as the difference between intentions and perceptions (I–P) if individual IB is sought. A positive gap in I–P for HPWSs implies that part of the power of HPWSs has been lost, and consequently, the firm will have to make a greater effort to better communicate its HRM intentions. However, when the difference in I–P is zero or negative, the firm may assume that its HPWSs are going to cause the intended effect on employees' exploratory learning and, consequently, on their IB.

6.2. Limitations and implications for future research

To conclude, the main limitations of this work may derive from the use of a single source of information and the cross-sectional nature of the study. Although we only surveyed researchers, we collected specific and large amounts of information about the institutional context in which these researchers work. We had access to institutional policies, strategies and guides, observed how these employees work, and adapted and clarified the questionnaire with all these data.

With respect to single source limitation and as it has been explained in section 4, we used Harman's single-factor test. However, there are questions about its sufficiency. In this vein, Simmering, Fuller, Richardson, Ocal, and Atinc (2015) and Podsakoff, MacKenzie, and Podsakoff (2012) suggested another technique based on the use of a confirmatory factor analysis to identify and control for method biases. Nevertheless, this technique could not be used in our study as we have estimated the model applying PLS. To sort out this limitation, we used other procedural remedies proposed by Podsakoff et al. (2012) to control for different sources of method bias. In this sense, we have improved the scale items to eliminate ambiguity by providing examples that clarify the concepts used.

In addition, some authors (Arthur & Boyles, 2007; Minbaeva,

2013) highlighted the necessity of conducting research on HPWSs and learning at the individual level. We also unleashed the potential for a new stream of work that considers HRM's role not in controlling and directing employees but rather in fostering exposure to new and different experiences and perspectives through exploratory learning. Combined with our focus on employees' perceptions of HRM practices and their relationship with innovation, we believe that our paper makes an important theoretical contribution to the field.

Future research could focus on gathering and analysing longitudinal data. Moreover, as suggested above, the supervisor's intention underlying the development of HPWSs and employees' perceptions should be measured and compared in an empirical work. In addition, this future research should also measure the effect of IB on individual and organisational innovation performance. Thus, we could assess the real effectiveness of IB. Furthermore, other contextual variables such as culture and climate could be considered in the analysis of the relationship between HPWSs and IB as these variables may actually affect the working context of employees and the implementation of HPWSs. Finally, the application of a survey is useful to observe the causal effects between variables and what individuals think about the phenomenon being analysed. However, in situations where mental processes acquire great relevance and individual perceptions, attitudes and behaviours are being studied, it would be of enormous value to know why individuals think as they do. To achieve this, a qualitative study could be designed and implemented.

Acknowledgements

This research has received financial support for the writing of the final version of the report from the University of Valencia (Special Research Action code: UV-INV-AE15-348043) as well as the Ministry of Economy and Competitiveness (Reference code: ECO2015-69316-R).

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