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Fostering intrapreneurial behavior through human resource management system

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Abstract

Purpose – This work aims to analyze the effect of employees' perceptions of high-performance work systems (HPWS) on intrapreneurial behavior (IPB), and the potential role of knowledge sharing as a mediating variable in this relationship.

Design/methodology/approach – Hypothesis testing was performed using a structural equation model (SEM) based on a PLS-SEM approach applied to a sample of 297 knowledge-intensive employees from six industrial companies of the Valencian region (Spain).

Findings – Results confirmed that the relationship between employees' perceptions of HPWS and IPB does not take place directly. Alternatively, this relationship occurs through knowledge sharing of employees.

Originality/value – This study makes theoretical and empirical contributions to better understand the impact of employee's perceptions of HPWS on IPB mediated by knowledge sharing. This work theorized and tested a model where the concept of IPB gains special relevance at academic and practical levels due to its implications for HRM.

Keywords Knowledge sharing, Intrapreneurial behavior, Intrapreneurship, High-performance work systems, HRM practices

Paper type Research paper

1. Introduction

Corporate entrepreneurship (CE) and intrapreneurial behavior (IPB) are considered to be key elements for organizational growth, differentiation and success. These concepts are used interchangeably in many articles, but an in-depth analysis indicates that CE refers to activities such as product innovation, business venturing and strategic renewal efforts (Zahra, 1993 and 1996; Zahra and Covin, 1995) from an organizational perspective, whilst intrapreneurship centers on the individual standpoint. In this respect, some authors have highlighted the fact that employees' behavior and processes are the key factors to every CE strategy, therefore requiring the study of antecedents and consequences at individual level (Ireland *et al.*, 2009). Although studies on employee entrepreneurship are emerging (Neesen *et al.*, 2019), there is a lack of analysis into individual entrepreneurial behavior in organizations. Considering that entrepreneurship-focused employees and their human capital are the key factors to the success of ventures, a closer look should be taken at intrapreneurs (Blanka, 2019; De Jong *et al.*, 2015).

The concept developed by specialist literature on entrepreneurship to give response to this phenomenon has been labeled as "intrapreneurship" (Sharma and Chrisman, 1999). Intrapreneurship is defined as the identification and exploitation of opportunities by individual workers to enable their organization to move forward, and it is generally characterized by employees' innovation and proactive and risk-taking behaviors (De Jong

et al., 2015). According to Razavi and Ab Aziz (2017, p. 771), “intrapreneurship refers to the entrepreneurship characteristics available in the present organization. An individual who is an intrapreneur behaves in an entrepreneurial manner in the organization”.

As previously stated, when analyzing the concept of intrapreneurship and its antecedents, we need to focus on the individual. Hence, in considering employees’ perceptions and behaviors, we can shed light on how employees should be managed to achieve strategic organizational goals and outcomes (Chang and Huang, 2005).

This study aims to investigate how IPB can be fostered and managed by using human resource management (HRM) practices as a system (high-performance work systems, HPWS). Following our previous arguments, we focus on the analysis of employees’ perceptions of high-performance work systems (HPWS), given that perceptions are the way in which individual behaviors take place (Arthur and Boyles, 2007). Authors such as Agarwala (2003) and Alfes *et al.* (2013) highlighted the need for more studies that analyze how individuals feel or perceive HRM actions. More specifically, employee attitudes and behaviors as a response to HPWS depend on how employees perceive when these practices are actually applied in their working context (Bowen and Ostroff, 2004; Ostroff and Bowen, 2016), rather than on what a manager says has been implemented. Additionally, the work of Nikolov and Urban (2013) tries to determine which criteria employees take into account to engage and participate in CE activities, i.e. the way employees themselves perceive that reward and participation systems are designed has a key influence on their motivation to exhibit IPB. Recent works of Korff *et al.* (2017) and Jiang *et al.* (2017) also put the emphasis of the relevance of employees’ perception on the HR practices.

Some studies have analyzed the relationship between HRM and CE (e.g. Hayton *et al.*, 2013; Tang *et al.*, 2015; Zhang, and Jia, 2010; Zhang *et al.*, 2008). However, as a response to the need to look further into the phenomenon of intrapreneurship, recent studies have focused their attention on analyzing the effect of HRM practices on intrapreneurship (see Christensen, 2005; Hayton, 2005; Madu and Urban, 2014). Some have placed the spotlight on single or specific practices (Castrogiovanni *et al.*, 2011; Shulman *et al.*, 2011; Madu and Urban, 2014; Teneau and Dufour, 2015) whilst others, like Hayton (2005), have conducted their analysis from a theoretical perspective, considering both the effect of isolated practices and the systemic effect of this bundle of HR practices.

Specialized literature (e.g. Combs *et al.*, 2006) has shown that HR practices considered as a system have stronger effects. Additionally, Delery and Shaw (2001) stated that the effect of HR practices on performance is more significant when practices are defined as bundles applied in a synergistic way (high-performance work systems, HPWS). Furthermore, some studies have revealed that the consideration of HRM practices as a system generates greater satisfaction, lower employee turnover, higher productivity and better decision-making, ultimately leading to higher levels of performance (Bowen and Ostroff, 2004; Datta *et al.*, 2005). Thus, our research follows this systemic approach.

Few previous studies have linked HPWS to corporate entrepreneurship (Mustafa *et al.*, 2016; Schmelter *et al.*, 2010; Zhang and Jia, 2010; Zhang *et al.*, 2008) preferring instead to analyze the relationship at the organizational level (Elia and Margherita, 2018). Consequently, and taking this fact into account, our purpose is to undertake an analysis of the relationship between HPWS and IPB, adopting a systemic approach and developing the analysis from the employee perspective.

Moreover, some of the scarce literature analyzing HPWS and intrapreneurship (Mustafa *et al.*, 2016; Ma *et al.*, 2017; Dal Zotto and Gustaffson, 2008) points out the relevant role of knowledge in this relationship. In particular, Mustafa *et al.* (2016) established the relevance and mediating role of knowledge sharing in fostering CE. Similarly, Hayton (2005), Kuratko *et al.* (2005) and Dal Zotto and Gustaffson (2008) stated that HRM should facilitate knowledge acquisition and integration, in order to boost the emergence of entrepreneurial

opportunities in the firm. Hayton (2005, p. 29), based on a social exchange perspective, established that there could be a link between HRM practices and the development of social capital and knowledge sharing. However, this did not only include explicit knowledge and written information and procedures but also encompassed tacit knowledge that can only be acquired through daily contact, and through teamwork, creating trust and shared viewpoints.

Therefore, we focus on the analysis of knowledge sharing as a mediating variable given

that previous works have established the relevant role of knowledge in promoting entrepreneurial behavior (Collins and Smith, 2006; Hayton, 2005; De Clercq *et al.*, 2013).

The contribution of this paper is threefold. First, it aims to analyze the effect of employees' perception of HPWS on their entrepreneurial behavior. Second, we analyze the mediating role of knowledge sharing in the relationship between HPWS and IPB. In addition, individual attributes (e.g. gender, education and work experience) are also considered as control variables as they have previously been identified as determinants when setting up a business. Apart from the theoretical contributions, we also propose managerial implications, putting forward some suggestions which could encourage IPB within organizations.

2. Theoretical framework

2.1 HPWS and IPB

The concept of intrapreneurship has been conceived as the ability of several individuals to jointly innovate and create within organizations (Haase *et al.*, 2015). According to Miller (1983), entrepreneurially oriented firms uncover and pursue possible avenues for achieving growth through an emphasis on innovation, proactiveness and risk-taking within their strategic processes and behavior. According to De Jong *et al.* (2011, 2015), the IPB of employees can be measured through three dimensions: (1) *innovativeness* captures the different stages of the innovation process, including opportunity exploitation, idea generation, championing and implementation or application; (2) *Proactiveness* includes people acting in anticipation, taking control and being self-starters; (3) *Risk-taking* is associated with facing potential losses in a broader sense and with an inclination to move forward without permission or consensus beforehand.

The role of firms' HPWS on IPB has received little attention, although prior research on CE has established that giving employees more scope to pursue opportunities within the firm is of vital importance to nurturing CE (Schmelter *et al.*, 2010; Zhang *et al.*, 2008; Zhang and Jia, 2010). Hayton (2004 and 2005) suggested that in the case of promoting entrepreneurship, existing evidence pointed out that the HR system was an important aspect, as it promoted autonomy and the discretionary behavior of employees. In this respect, Tang *et al.* (2015) posited that it is the employees who make entrepreneurial activities succeed, which suggests the relevance of HPWS to intrapreneurship. Therefore, internal managerial actions, like the implementation of HPWS, can exert a relevant role on the promotion of employees' IPB (intrapreneurship).

Two theoretical frameworks support the positive relationship between HPWS and IPB. First, the link between HR practices and individual behavior has been analyzed mainly through the AMO (ability-motivation-opportunity) framework, in which it is understood that employees' behavior is based on three components (Appelbaum *et al.*, 2000): the possession of the appropriate skills, the necessary motivation to carry out the work and the opportunity for individuals to participate. This participation may be facilitated through structural or job design decisions and communication initiatives, thus including the working environment in the concept of opportunity (Marin-García and Martínez, 2016). HR practices can clearly contribute to stimulate the acquisition of skills, the necessary intrinsic and/or extrinsic motivation, and can also generate favorable conditions to foster participation. Another theoretical framework used to predict the effects of HPWS on employees' behavior is the

social exchange theory. Under this perspective, which was originally put forward by [Blau \(1964\)](#), employees who perceive their organizational environment as being supportive will feel obliged to reciprocate with behaviors that are beneficial to the organization. Multiple studies have suggested that HPWS foster a high-quality employee-organization relationship that motivates employees to devote themselves to contributing innovative ideas to the organization ([Paul and Anantharaman, 2003](#); [Wright et al., 2003](#)).

Under this framework, different works have analyzed the effect of single or isolated HR practices as drivers of innovative and IPB. In particular, some of these studies have concentrated on compensation practices as a way of encouraging innovation and intrapreneurship through motivation. At the same time, these practices can prevent employees from leaving the company to start their own business ([Hayton, 2005](#); [Shulman et al., 2011](#)). [Madu and Urban \(2014\)](#) also suggested that economic compensation is not the only factor to promote intrapreneurship, given that non-economic rewards, such as growth opportunities, promotions and flexibility are also considered relevant to promote intrapreneurship. Other studies included different HR practices such as recruitment and communication as being relevant to IPB. For example, recruitment can be used as a tool for hiring employees who have a suitable profile for promoting entrepreneurial initiatives ([Teneau and Dufour, 2015](#)), and for open communication, helping to establish relationships of trust that are essential to foster intrapreneurship ([Castrogiovanni et al., 2011](#)).

However, our focus in this research centers on the consideration of HR practices as a system, instead of analyzing individual practices. [Hayton \(2005, p. 30\)](#) affirms, based on the works of [Delery and Doty \(1996\)](#), that “when HRM practices are internally consistent, they reinforce one another so that their sum is a synergistic influence upon desired employee behaviors”. Under the arguments of the social exchange theory, HPWS enhance employees’ skills, their participation in decision-making, and their motivation to exert discretionary or spontaneous efforts ([Appelbaum et al., 2000](#)). HPWS facilitate the process of developing a kind of high-quality exchange relationship between employees and organizations that leads employees to assume the role of efficient organizational agents ([Leana and Van Buren, 1999](#)). It should be noted that when literature talks about HR practices or HPWS, it generally refers to recruitment, selection, training, remuneration systems, evaluation of and attention to labor relations, health and safety and justice ([De Cieri and Krammar, 2008](#); [Dessler, 2007](#)). In this work, we use the scale compiled by [Jensen et al. \(2013\)](#), who included practices such as recruitment and selection, training and development, performance appraisal, communication, job security, and rewards and recognition in their system.

Although there seems to be a consensus on the fact that HR practices can positively affect innovative and intrapreneurial behaviors, and the theoretical frameworks explaining these relationships, several authors ([Hayton, 2005](#); [Hayton et al., 2013](#); [Bos-Nehles et al., 2017](#)) have also taken a critical view of this literature. [Hayton \(2005\)](#) established that evidence and empirical works on these topics is still limited, and that contingent approaches that include the effect of variables such as strategy and technology should be included. The author states, after his literature review, that there are some contradictions in the literature, mainly in terms of reward systems. There is no agreement with respect to which type of rewards HPWS must consider, raising the question of whether to include both intrinsic factors as well as extrinsic rewards. Other frameworks, such as the agency theory, offer different explanations for the effect of compensations with respect to the social exchange approach. Another question that is not clear and that requires more research ([Hayton et al., 2013](#)) is offering sets of differentiated practices to different types of workers, as [Lepak and Schnell \(2002\)](#) suggested. [Hayton et al. \(2013\)](#) established that more research is required to establish the effect of HPWS on the entrepreneurial behavior of qualified workers, who are the “core” employees in an innovative firm. [Bos-Nehles et al. \(2017\)](#) stated that the different results reported by literature may be influenced by the methods used in the analysis of the main variables.

Recent works provide evidence and have obtained positive results when analyzing the effect of HPWS on innovation, CE and IPB. [Mustafa et al. \(2016\)](#) established that there is a direct relationship between HPWS and CE, examining data from middle managers in an Asian context. The authors also introduced the effect of knowledge sharing as a partial mediator of the relationship. [Sanz and Jiménez \(2018\)](#) stated that HPWS and committed-oriented HR practices can foster innovative work behavior, also stating that there is major consensus in the literature about this question. [Bos-Nehles et al. \(2017\)](#), after a detailed

literature review, confirmed that HRM practices, and especially high commitment work practices positively affect innovative work behavior. Consequently, HPWS become mechanisms that managers can use to promote IPB in the organization, through training practices, motivation and commitment, and other participation channels that are created. In addition, HPWS help to create fluent communication between supervisors and employees, facilitating workers' participation in the adoption of initiatives and the assumption of risks. Based on these arguments, and in an attempt to expand the sources of evidence on these topics, we propose our first hypothesis:

H1. Employees' perceptions of HPWS are positively linked to employees' IPB.

2.2 The role of knowledge sharing in the relationship between HPWS and IPB

Knowledge is the basis of an organization's intellectual capital, and its importance in promoting competitive advantage is increasing ([Ndofor and Levitas, 2004](#); [Riege, 2005](#); [Van Wijk et al., 2008](#)). However, knowledge needs to be made available to individuals in order to facilitate the generation of intellectual capital, and knowledge sharing becomes fundamental in this process ([Van den Hoof and Huysman, 2009](#)).

There are multiple definitions of knowledge sharing. [Yi \(2009, p. 68\)](#) considers it as a "set of individual behaviors involving sharing one's work-related knowledge and expertise with other members within one's organization, which can contribute to the ultimate effectiveness of the organization". [Chen and Huang \(2009, p. 108\)](#) state that "knowledge sharing refers to collective beliefs or behavioural routines related to the spread of learning among different individuals or units within an organization". Again from a learning perspective, [Crossan et al. \(1999\)](#) argued that knowledge sharing becomes the fundamental process through which individuals acquire a collective understanding of reality. This shared understanding is the basis of the search for new solutions or new ways of solving problems, given that this new knowledge will affect the interpretation of individuals in future interactions with other colleagues.

Previous studies (see [Collins and Smith, 2006](#); [Foss and Minbaeva, 2009](#); [Scarborough, 2003](#)) recognize that there is a link between HRM practices and knowledge sharing. However, [Foss and Minbaeva \(2009\)](#) recognize that the existing empirical work studying the influence of these practices and their systemic effect (i.e. HPWS) on knowledge performance is ambiguous. More recent literature on this topic has focused on the way HR practices can encourage knowledge creation in organizations ([Sammorra et al., 2017](#)), as knowledge is the basis for innovation, and this is one of the main sources of competitive advantage in current turbulent and hostile environments ([Kianto et al., 2017](#)). In this sense, [Hayton et al. \(2013, p. 385\)](#) stated that "the HR system must facilitate the acquisition (or creation), integration and exploitation of new knowledge. In so doing, the HR system itself becomes a strategic capability". Consequently, organizations should select HR systems that provide the opportunity to develop these new skills and knowledge. [Hayton \(2005\)](#) established that HRM should encourage organizational learning and knowledge sharing (both explicit and tacit, through teamwork and internal networks) in order to finally promote CE. [Iqbal et al. \(2015\)](#) found that some single HR practices, such as those oriented to collaboration (teamwork and communities of practice) revealed a positive relationship with

knowledge sharing, and that this process of teambuilding increases trust and also reinforces the knowledge-sharing process. [Gope et al. \(2018, p. 650\)](#) established that HPWS “support the knowledge management capacity of organizations”, making special reference to knowledge acquisition and knowledge sharing. They also emphasized that this is more significant in knowledge-intensive industries. More recently, [Gara Bach Ouerdian et al. \(2019\)](#) obtained evidence confirming a direct link between HRM practices and knowledge sharing behavior in the context of Tunisian knowledge-intensive firms (KIFs). Finally, [Fong et al. \(2011\)](#) obtained results to prove the existence of a positive and significant relationship between all the HR practices included in a system (recruitment and selection, performance appraisal, teamwork, training and development) with the exception of rewards and knowledge sharing.

Hence, and with more relevance in knowledge-intensive firms and workplaces, we can expect that HPWS will encourage and facilitate (through teamwork, participation, training and a performance appraisal system oriented to development) employees’ interest in acquiring and sharing knowledge with colleagues which will contribute both to their own internal development and also to the creation of competitive advantage for the firm. Consequently, we can formulate our second hypothesis:

H2. Employees’ perceptions of HPWS are positively linked to employees’ knowledge sharing (KNSH).

Previous literature has also established that knowledge sharing is essential for employees to develop IPB in the organization. It is through its employees that an organization can create, acquire and transfer information and knowledge ([King, 2001](#)). Individual knowledge does not automatically lead to entrepreneurial action; it requires extant knowledge-sharing routines that connect the firm’s different knowledge domains ([Floyd and Wooldridge, 1992](#)). [Goosen et al. \(2002\)](#) linked different dimensions with the concept of intrapreneurship. Some of these dimensions are management style and orientation, transparent communication, easy exchange of ideas and an environment open to change, among others. In this sense, following these arguments, the exchange of ideas is related to IPB. Transparent communication, comprising effective information flows and idea sharing is also important to enable intrapreneurship ([Haase et al., 2015](#)). In turn, [Carmeli et al. \(2013\)](#) argued that knowledge sharing may encourage individuals to think more critically and creatively, so they can ultimately generate new ideas by adopting innovative behavior. [Del Giudice and Della Peruta \(2016\)](#) argued, from an organizational perspective, that knowledge sharing, promoted by knowledge management systems, helps to create and disseminate a culture and atmosphere that contribute to internal venturing, encouraging employees to become intrapreneurs. Accordingly, we argue that employee knowledge sharing becomes essential to encourage employees’ IPB within the organization. Bearing in mind these arguments we propose the following hypothesis:

H3. Employees’ knowledge-sharing behavior is positively linked to employees’ IPB.

Recently, [Mustafa et al. \(2016\)](#) proposed the mediating effect of middle managers’ knowledge sharing in the relationship between HPWS and CE. They tested the proposed model on a sample of Malaysian middle managers, finding support for their hypotheses. In our study, we aim to shed light on the role of knowledge-intensive employees’ knowledge-sharing behavior in the relationship between employees’ perceptions of HPWS on IPB. In this respect, previous studies (e.g. [Foss et al., 2010](#); [Minbaeva, 2013](#)) have called for a greater focus on the analysis of the relationship between HPWS and knowledge, pointing out the need to study them from an individual perspective ([Felin and Foss, 2005](#)). In this sense, we claim that employees’ perceptions of HPWS provide employees with the right context and mechanisms to facilitate knowledge sharing ([Andreeva and Sergeeva, 2016](#)), for example, through teamwork which, in

turn, will contribute to the generation of new ideas and proactive behaviors. From an organizational perspective, [Turner and Pennington III \(2015\)](#) also studied knowledge sharing as a mediating variable between some structural variables (including performance appraisal, rewards, autonomy, culture and managerial support) and organizational learning. The mediating effect of knowledge sharing has also been analyzed by [Ma et al. \(2017\)](#). Their study was developed using a multilevel perspective (firm and team levels), showing that ability-enhancing HR practices and motivation-enhancing HR practices, via knowledge sharing,

were positively linked to team creativity. The authors established that practices such as team-based compensation and performance appraisal can foster knowledge-sharing behaviors, thus enhancing creativity.

Along these lines, we have argued that HRM practices may increase the willingness of individuals to share knowledge with their colleagues. This process of knowledge sharing enables individual knowledge to be combined with other individuals' knowledge, bringing collective shared knowledge as a result. Subsequently, this collective knowledge will act as an input for the next cycle of individual learning that may contribute to generate new ways of solving problems, new processes or new products and services.

Taking these ideas as a starting point, we formulate the following hypothesis.

H4. Employees' knowledge sharing (KNSH) mediates the relationship between employees' perceptions of HPWS and IPB.

Considering the previous research, in this work, we closely controlled the level of studies (education) ([Ramana et al., 2009](#); [Tamasy, 2006](#)), sectorial experience ([Ramana et al., 2009](#)), age ([García-Ramos et al., 2010](#); [Ramana et al., 2009](#); [Tamasy, 2006](#)) and gender ([García-Ramos et al., 2010](#); [Tamasy, 2006](#)).

The following figure depicts our theoretical model (see [Figure 1](#)).

3. Methodology

3.1 Procedure and sample

A quantitative methodology was applied to achieve the proposed objectives and test the hypotheses formulated above. All of the variables were measured using multiple-item scales (seven-point Likert scales) employed in previous studies. The questionnaire was previously pre-tested to ensure a proper understanding of the items and to assess the ability of the scales to capture the desired information. The information obtained was used to refine the tool. The final version of the survey was sent by email and distributed with the invaluable help of the managerial team in each company. We collected data from 297 employees in six firms located in the Valencian region (Spain). These companies operate in a variety of industries: engineering, electronics, welfare services and advanced manufacturing. The sample was

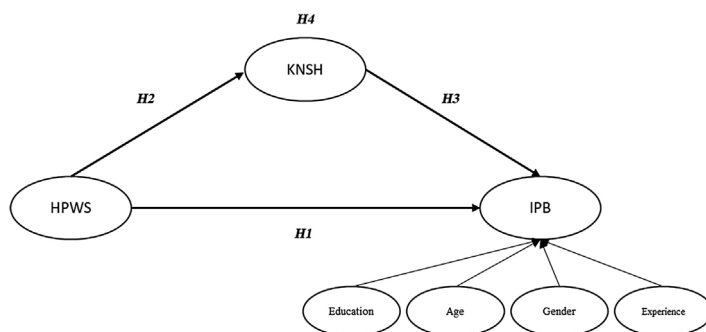


Figure 1.
Theoretical model

consistent with the previous research (Gong *et al.*, 2013; Ma *et al.*, 2017) in that the data were collected from various different industries. In order to control for potential environmental disparities, the sample was limited to large (more than 250 employees) knowledge-intensive firms located in the Valencian region. This Spanish Mediterranean location is characterized by being highly dynamic and is home to some of the most advanced firms and clusters in terms of innovation (such as the ceramic tile and electronics industries). Additionally, this geographical area offers considerable advantages in terms of transport infrastructure, science parks and research centers that encourage knowledge transfer and consequently constitute a source of knowledge capital. Our research targeted employees working in different departments within these companies such as HR, finance, administration, legal, marketing, purchasing, planning, engineering, quality, environment, innovation and information technologies. We selected employees working in these departments as they have a significant intrapreneurial component and knowledge management is a fundamental part of their daily activities. Data were collected in 2018. Table I details the demographic characteristics of our sample.

As we can observe, the sample is quite balanced with respect to gender (42 percent male; 58 percent female) and concerning the level of education, 72 percent of employees have university degrees or higher, which is typical of knowledge-intensive workers. Surveyed employees have a great work experience on average and are middle-aged.

3.2 Measurement scales and data analysis

The IPB concept was based on the three constructs proposed by De Jong *et al.* (2015): innovative behavior was measured using the scale developed by Scott and Bruce (1994), whilst the constructs of proactivity and risk-taking were measured using the scale compiled by De Jong *et al.* (2015). HPWS was measured using the scale of Jensen *et al.* (2013), and knowledge sharing was measured using the scale from Flores *et al.* (2012). SmartPLS 3.2 (Ringle *et al.*, 2015) was used to test the hypotheses proposed in our model.

The control variables used were codified as follows: educational level (Dummy_1: 1 5 degree level or higher; 0 5 less than university level, gender (1 5 male; 0 5 female), age (1 5 between 18 and 30, 2 5 31–45 3 5 46 or more) and work-related experience.

4. Results

4.1 Descriptive analysis

As we can observe in Table II, the correlations between HPWS, knowledge sharing and IPB were positive and significant ($p < 0.01$). In addition, the mean values of the key variables in the study were above five (see Table II), indicating that employees in the sample were appropriate for studying the proposed relationships, i.e. knowledge sharing, HPWS and IPB are relevant characteristics of their daily activities.

4.2 Evaluation of the structural model

We have applied partial least squares path modeling (PLSPM) with SmartPLS 3.2 to estimate the structural model, using reflexive constructs. Following the suggestions of Hair *et al.* (2012) for PLSPM, the properties of the model were assessed. Indicators showed high reliability, as

Table I.
Demographic
characteristics

	Frequencies	Mean	SD
Gender	42% Male 58% Female		
Education	72% degree level or higher, 28% less		
Work experience	Measured in years	13.71	8.69
Age	13.7 % (18–30) 61.2% (31–45) 25.2 (b45)		

they were significantly related to their respective constructs ($p < 0.01$) and standardized loads were greater than 0.7 (Barroso *et al.*, 2010).

Internal consistency and the indicators of discriminant validity are shown in Table III. The CR values of the constructs ranged from 0.88 to 0.95 and were all greater than the threshold of 0.7 (Bagozzi and Yi, 1988). Similarly, the AVE values for each construct (shown in bold on the diagonal of the matrix) were higher than the threshold of 0.50 (Fornell and Larcker, 1981) confirming the convergent validity of the measurement model. We have

followed Fornell and Larcker (1981) to evaluate discriminant validity. The AVE values were greater than the squares of the correlations between each pair of factors (see Table III). In addition, we have checked that each item had a greater load on the factor that measured its cross-charges related to the rest of the latent variables (Henseler *et al.*, 2009).

To evaluate the predictive relevance of the model's dependent variable (IPB) we applied the Stone-Geisser Q^2 test (Geisser, 1975), using blindfolding. The dependent latent variables showed a Q^2 value greater than 0, indicating the predictive validity of the model (Chin, 1998). The R^2 value of the latent dependent variables was used to establish the amount of variance explained by the model (see Table IV). This indicator has to be greater than 0.1. (Falk and Miller, 1992) and this was confirmed in our model.

In addition, we checked common method bias using the test proposed by Kock (2015) for PLS-SEM analysis. In the case of our study, all VIF factor-level values were lower than 3.3. Therefore, it can be said that our model is free of common method bias.

4.3 Hypothesis

testing

Table IV shows the results for hypotheses 1, 2 and 3. The first hypothesis analyzed the direct relationship between HPWS and IPB. Results showed a non-significant effect on IPB ($\beta = 0.12$, $p > 0.05$, t -value = 1.30). Therefore, our first hypothesis is not supported.

With regard to the second hypothesis (employees' perceptions of HPWS are positively linked to employees' KNSH behavior, results showed a positive and significant link between employees' perceptions of HPWS and their willingness to share knowledge ($\beta = 0.79$, $p < 0.001$, t -value = 33.64). Therefore, the second hypothesis is sustained.

	Mean	SD	1	2	3	4	5	6
1. IPB	5.26	0.94						
2. HPWS	5.06	1.19	0.54**					
3. KNSH	5.10	1.10	0.63**	0.77**				
4. Education			0.11	0.07	0.02			
5. Age			−0.03	−0.02	−0.10	0.20**		
6. Work Experience	13.71	8.69	0.02	0.09	0.14*	−0.24**	−0.70**	
7. Gender			−0.05	−0.04	−0.03	0.13*	0.06**	−0.10

Note(s): * $p < 0.05$; ** $p < 0.01$

Table II.
Mean, standard
deviation and
correlations between
variables

CR	0.88	0.92	0.95
AVE	F.1	F.2	F.3
1. Intrapreneurial behavior	0.71		
2. Knowledge sharing	0.40	0.63	
3. HPWS	0.29	0.59	0.60

Note(s): CR (in the first row of the matrix); AVE (shown on the diagonal of the matrix); the rest of the data show the square of the correlations between factors

Table III.
CRs, AVE and square
of the correlations
between factors

The third hypothesis proposed that employees' knowledge-sharing behavior is positively linked to employees' IPB. In this case, results showed a positive and significant effect of knowledge sharing on IPB ($\beta = 0.55$, $p < 0.001$, t -value $= 5.90$). Therefore, our third hypothesis is also supported.

To test the fourth hypothesis (H4: Employees' KNSH mediates the relationship between employees' perceptions of HPWS and IPB), a mediation analysis was drawn up to study the effect of knowledge sharing on the relationship between employees' perceptions of HPWS and IPB. The first condition for mediation to take place is the existence of a positive and significant effect in the direct model (employees' perceptions of HPWS and IPB). Results from the direct model showed the existence of a direct relationship ($\beta = 0.56$, $p < 0.001$); besides, with regard to the control variables, only education shows a significant influence on IPB ($\beta = 0.10$, $t = 2.08$, $p < 0.05$). Therefore, the first condition for mediation was met.

Following Preacher and Hayes' (2004; 2008) approach, the sampling distribution of the indirect effect was bootstrapped (5,000 samples). Results showed a significant indirect effect ($\beta = \text{HPWSs} \times \text{KNSH} = 0.44$; $t = 5.73$, $p < 0.00$). The non-significant link between HPWS and IPB and a variance accounted for (VAF) of 75 percent confirmed the complete mediating role of knowledge sharing (see Table V). In addition, the R^2 value of this model was clearly greater than the one in the direct relationship ($0.32 < 0.43$), which shows an improvement in the predictive validity of the model. Again, only education shows a significant influence on IPB ($\beta = 0.12$, $t = 2.82$, $p < 0.001$). Control variables were only significant for IPB. Initially, links from the control variables to the dependent variables (IPB and KNSH) were included. However, we discarded this option as control variables did not show any significant effect on KNSH and its inclusion increased the complexity of the model without adding value to the main relationships studied.

Our results (see Figure 2) show a mediating effect of knowledge sharing between employees' perceptions of HPWS and IPB. Consequently, HPWS affects the IPB of employees when they actively share knowledge. In other words, HPWS influences IPB through the processes of knowledge acquisition and sharing.

5. Discussion and conclusions

The main goal of this work was to analyze the phenomenon of IPB (a key element for organizational survival and success) and its relationship with employees' perceptions of HPWS and knowledge sharing, at individual level. This study makes theoretical and empirical contributions to better understand the impact of HRM system implementation on IPB. More specifically, this work shows that this impact is indirectly produced by employees' KNSH behavior.

Hayton et al. (2013) established the need to obtain more empirical evidence on the relationship between HPWS and intrapreneurship and on the role of knowledge and learning in the relationship. In accordance with the results obtained in this study, we can state that employees' perceptions of HPWS do not have a direct effect on IPB. Instead they have an indirect effect on IPB when mediated by knowledge sharing. These results confirm and go further than previous studies which theoretically proposed (see Hayton, 2004 and 2005) that HR systems could play a relevant role in promoting IPB within organizations.

Our research supports the results of recent works which affirm that HPWS can foster knowledge sharing in the organization (Fong et al., 2011; Gope et al., 2018; Gara Bach Ouerdian et al., 2019), with this being a key factor in the promotion of innovation and intrapreneurship behavior in the organization. As a result of including knowledge sharing as a crucial aspect in our analysis, this study provides new empirical evidence on the exploration of the relationship between HPWS and IPB, demonstrating, as a result, that this link takes place through knowledge sharing. As there is little quantitative empirical

research supporting the proposed relationships (See: [Mustafa et al., 2016](#); [Ma et al., 2017](#)), our results will contribute to clarify the mechanisms through which the relationship takes place.

Additionally, in our study, we provide a novel view by examining these relationships at the individual level of analysis as encouraged by relevant previous studies ([Felin and Foss, 2005](#); [Foss et al., 2015](#); [Minbaeva, 2013](#)). Furthermore, another contribution of this study is the consideration of HRM practices as a system, given that previous studies frequently linked

only one or just a few practices to CE. Only a small number of existing studies have empirically considered the influences of sets of practices on individual employees' behaviors in supporting CE [Schmelter et al. \(2010\)](#); [Zhang et al. \(2008\)](#); [Zhang and Jia \(2010\)](#); [Maet al. \(2017\)](#).

This work shows how the use of HPWS (which include practices such as the generation of a participative climate, fluent and close communication, security, and practices that encourage teamwork and performance appraisal based on development) contribute to the IPB of employees, who are not afraid to assume certain risks when developing a project and are proactive, aiming to anticipate the different challenges that occur when performing work.

In addition, our research shows the importance of knowledge sharing among employees in a company, as suggested in previous studies ([Shane and Venkataraman, 2000](#); [West and Noel, 2009](#)). This interchange of knowledge will ensure that the framework created by HRM systems truly boosts the IPB of employees. As a result, the organization will improve its level of IPB and its competitive results.

Our results are also relevant for managers and practitioners. These results emphasize the relevance of employees' perceptions of HPWS in order to foster knowledge sharing behaviors that are necessary to develop IPB. Thus, managers should provide HRM systems ([Jensen et al., 2013](#)) that include training and development, teamwork, open communication, intrinsic motivation (growth opportunities, participation) and extrinsic motivation (performance appraisal, rewards) in order to promote a favorable climate in which employees share knowledge and work together to develop IPB. Managers should endeavor not only to select

Proposed relationships	Estimate	t-value
H1: HPWS-IPB	0.12 n/s	1.30
H2: HPWS-KNSH	0.79***	33.64
H3: KNSH on IPB	0.55***	5.90

R^2 (IPB) 5 0.43; R^2 (K sharing) 5 0.62; Q^2 (IPB) 5 0.20; Q^2 (knowledge sharing) 5 0.37;

Note(s): * $p < 0.05$; ** $p < 0.01$, *** $p < 0.001$. Only education shows a significant influence on IPB (β 5 0.12 t 5 2.82, $p < 0.001$).

Table IV.
Hypothesis testing (H1, H2 and H3)

Model	Relationships proposed	Parameter identification	Standardised path coefficients	t-value (bootstrap)
A	HPWS-IPB	c'	0.56***	14.81
B	HPWS-IPB	c	0.12 n/s	1.30
	HPWS-KNSH	a	0.79***	33.64
	KNSH-IPB	b	0.55***	5.90
	Indirect effect	$a \ 3 \ b$	0.44***	5.73

Note(s): Model A 5 only direct effect of HPWS on IPB; Model B 5 Full model, HPWS on IPB controlling by KNSH. * $p < 0.05$; ** $p < 0.01$, *** $p < 0.001$; VAF 5 ($a \ 3 \ b$) / ($a \ 3 \ b \ b \ c$) 5 0.75. R^2 (IPB) 5 0.43

Table V.
Mediation effect testing

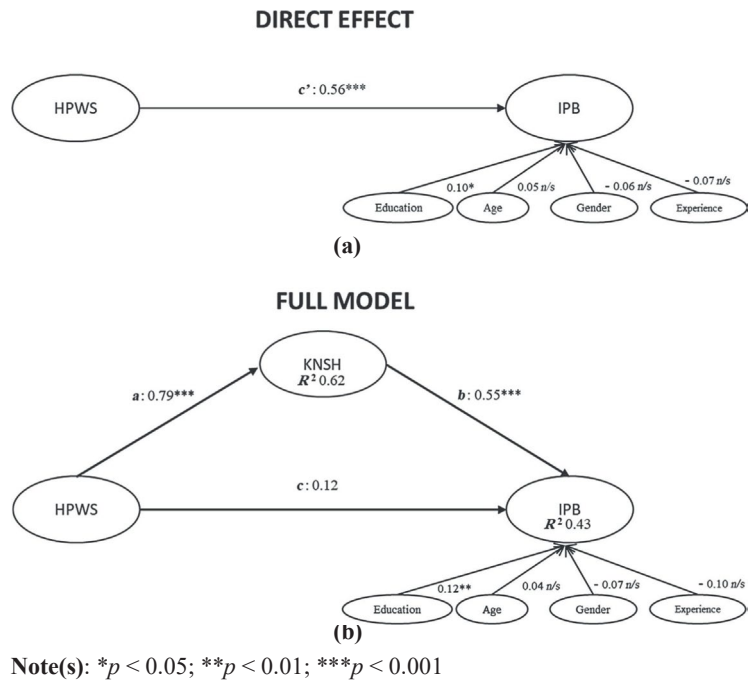


Figure 2.
Results of the
mediation hypothesis

the right practices but also to endow the system with the necessary coherence and consistency, in the sense expressed by [Bowen and Ostroff \(2004\)](#), so that the intended HR strategy turns into perceived HPWS and, hence, into the behaviors sought by the company.

Moreover, sharing knowledge is an important way for employees to be intrapreneurial that will contribute to innovation through a more proactive and creative behavior. Consequently, these processes must be monitored, encouraging the procedure of acquiring and communicating their ideas, detecting when employees are reluctant to share their tacit or explicit knowledge, or are averse to active communication with other departments or members of their teams or departments. In this situation, supervisors should pay attention to how the HPWS is being applied, if the practices are coherent and consistent with what was explained to employees and with the strategy of the firm. For this purpose, different indicators should be collected and monitored to detect possible deviations between the designed and implemented HRM strategy.

This work also has its limitations, since it is cross-sectional and is a self-reported study. In future research, it would be interesting to consider a multilevel perspective in order to compare both managerial and employee viewpoints and examine the influence of one level on the other. It would also be interesting to carry out in-depth interviews (with employees and managers in different areas of the firm) in order to obtain qualitative information on how and why the different processes and relationships analyzed take place. In addition, due to the relevant influence of the institutional context (formal institutions, culture and education, Scott's three pillars ([2001](#))) on entrepreneurship, its magnitude, typology and probabilities of success, as well as on individual behavior ([Dilli and Westerhuis, 2018](#)), it would be a good idea to replicate the study in different countries and analyze how the differences in institutions affect the detected relationships.

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Further reading

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- Malach Pines, A., Lerner, M. and Schwartz, D. (2010), "Gender differences in entrepreneurship: equality, diversity and inclusion in times of global crisis", *Equality, diversity and inclusion: An International journal*, Vol. 29 No. 2, pp. 186-198.

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