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Perceptions of HR practices and innovative work behavior: the moderating effect of an innovative climate

Anna. C. Bos-Nehles and Andre A.R. Veenendaal

School of Behavioural, Management and Social Sciences, University of Twente, Enschede, The Netherlands

ABSTRACT

The purposes of this paper are to explore the effect that perceived HR practices have on the innovative work behavior (IWB) of individual workers and to examine the role that an innovative climate plays in this relationship. We hypothesize that employees will show greater IWB if they perceive the organizational climate to support innovation and perceive the presence of HR practices related to a compensation system, training and development, information sharing, and supportive supervision. Using data from 463 individuals in four Dutch manufacturing companies, the study tests the effects of employees' perceptions of HR practices and of an innovative climate on their innovative behaviors. We found that employee perceptions of a compensation system are negatively related to IWB, and that employee perceptions of information sharing and supportive supervision are positively related to IWB. The effect of perceptions of information sharing and training and development on IWB are moderated by an innovative climate, in such a way that information sharing has a stronger effect on IWB and training and development a weaker one. Managers can stimulate innovative behavior by investing in information sharing, supportive supervision, and establishing an innovative climate.

KEYWORDS

Innovative work behavior;
perceived HR practices;
innovative climate

Introduction

In searching for ways that organizations can increase their innovative outcomes, the role of human resources, and their management, has become more central in the past decade (Beugelsdijk, 2008; Shipton, West, Dawson, Birdi, & Patterson, 2006). Most such studies focus on innovation at the organizational level, where HR practices or HR systems have been shown to affect innovative outcomes, albeit through mediating variables such as knowledge or intellectual capital (Cabello-Medina, López-Cabrales, & Valle-Cabrera, 2011). The effect of HR

CONTACT Anna. C. Bos-Nehles  a.c.nehles@utwente.nl

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practices on innovation at the individual level has received less attention (Yuan & Woodman, 2010).

Following from the observation that the basis of all innovations is good ideas that are then developed further, individuals logically play a vital role in innovation because they are the holders and processors of ideas (Van de Ven, 1986). In order to gain an understanding of how individual employees can be motivated to utilize these ideas for innovative outcomes, it is necessary to investigate what stimulates individual innovative behavior (Scott & Bruce, 1994). Here, we study innovative work behavior (IWB) as a conceptualization of individual innovation (De Jong & Den Hartog, 2010; Janssen, 2000; Kleysen & Street, 2001). IWB is defined as the behavior of an individual that is intended to intentionally create, introduce, and apply new ideas, processes, or products (Janssen, 2000).

Organizations are able to stimulate desired behaviors by using HR practices that encourage specific attitudes and behaviors, and discourage undesired behaviors. Based on the ideas of social exchange theory (Blau, 1964) and signaling theory (Bergh, Connelly, Ketchen, & Shannon, 2014; Connelly, Certo, Ireland, & Reutzel (2011), employees are seen as perceiving HR practices as signals of the organization (Bowen & Ostroff, 2004; Dorenbosch, Van Engen, & Verhagen, 2005). An organization's managers signal which behaviors are valued and rewarded, and employees interpret the signal and behave accordingly. If employees perceive the organization as providing value, they will feel obliged to reciprocate with something of value, such as by helping the organization achieve its goals (Stinglhamber & Vandenberghe, 2003). If employees, through their perceptions of HR practices, conclude that innovative ideas are rewarded, and that the work environment is focused on generating and championing new ideas, they will reciprocate with innovative behaviors. Thus, in this paper, we aim to understand the effect of perceived HR practices on IWB.

We investigate the effect of four individual-level high-commitment HR practices on IWB: perceptions of the compensation system, of training and development, of information sharing, and of supportive supervision. The systematic literature review by Seeck and Diehl (2017) indicated the importance of high-commitment HR practices for innovation, and Zhou, Hong, and Liu (2013) argued that high-commitment HR practices are advantageous for innovation outcomes because practices such as employment security establish employees' psychological commitment to the organization and motivate employees to take risks. The central idea is that employees who perceive that they are fairly compensated, who are offered training and development programs, who feel that information is shared with them, and who perceive that their supervisor supports them will repay the organization with IWBs. Based on these individual practices, we investigate to what extent perceptions of HR practices enhance IWB.

There is always the possibility that employees will not perceive HR practices as they were intended because individuals apply different schemas in perceiving and interpreting HR-related information (Wright & Nishii, 2013). The messages

that organizational members receive from the organization concerning the type of behaviors that are important and that are expected, supported, and rewarded, are captured in the concept of organizational climate (Schneider & Reichers, 1983). An organizational climate that is supportive of innovative behavior is labelled an innovative climate. According to Schneider (1975), 'climates serve as frames of reference for the attainment of congruity between individual behavior and the organizational system's practices and procedures' (Malik & Wilson, 1995, p. 203). Individuals form impressions of an organization's practices through repeatedly experiencing these practices. Employees who perceive HR practices that make them feel valued in their work environment and that are supportive of innovation will understand that they can reciprocate through innovative behavior since this will help achieve organizational objectives. On this basis, we argue that an innovative climate moderates the relationship between perceptions of HR practices and IWB.

This paper contributes to the literature by explaining how the IWB of individual employees is affected by their perceptions of HR practices (Dorenbosch et al., 2005) and of the innovative climate (Malik & Wilson, 1995; Scott & Bruce, 1994). Previously, the HRM – innovation link has mainly been studied in terms of organizational innovative outcomes, and this paper brings greater understanding of the relationship between HRM and individual innovation. Until now, there has been a lack of insight into how organizations can stimulate IWB by offering certain HR practices to employees. We thus test the effect of perceptions of four individual HR practices on IWB.

This study also contributes to the literature by explaining the extent to which an innovative climate can enhance the effect of perceived HR practices on IWB. Certain HR practices may have a stronger effect on IWB when they are offered in a climate that is perceived as supportive of innovation and risk-taking. Here, we add to our understanding of the important role that supervisors play in facilitating IWB in organizations (De Jong & Den Hartog, 2007) by specifying their role in building an innovative climate.

A third contribution is the focus on *perceptions* of HR practices. Since the seminal work by Bowen and Ostroff (2004), we know, given the relationship between HRM and performance-related outcomes, that HR processes play a crucial role. By understanding HR practices as signals that a company uses to inform their employees about what is expected of them, and how they should behave, HR practices communicate a message, albeit one that can be interpreted idiosyncratically by different users. More recently, researchers have increasingly addressed the crucial role that employees' perceptions of HRM have on their attitudes and behaviours (Alfes, Shantz, Truss, & Soane, 2013; Baluch, 2017; Jiang, Hu, Liu, & Lepak, 2017), such as discretionary behaviours (Elorza, Harris, Aritzeta, & Balluerka, 2016). Interpreting HR practices as messages that a company sends to its employees means that one should study the perceptions of HR practices by their end-users, in our case employees, because these can explain the effect on IWB.

The effect of HRM on innovation

This study focuses on behavior, and more specifically IWB, as an individual-level outcome. This outcome amounts to an innovation that is dependent on an employee's intentional effort to provide beneficial novel outcomes at work (Janssen, 2000). IWB can be defined as individual actions directed at generating, processing, and implementing new ideas, including new product ideas, technologies, procedures, and work processes, with the goal of increasing the organisation's effectiveness and success (Kleysen & Street, 2001; Yuan & Woodman, 2010). This rather comprehensive behavioural construct consists not only of the generation of ideas but also their transformation into concrete innovations (Devloo, Anseel, De Beuckelaer, & Salanova, 2015). IWB is seen as an extra-role, or discretionary, behavior that goes beyond prescribed role expectations in that it is not explicitly expected of employees (Janssen, 2000). Further, only prescribed behaviors are formally rewarded by the compensation system (Janssen, 2000; Ramamoorthy, Flood, Slattery, & Sardesai, 2005). Although previous research has established the importance of IWB in creating a sustainable competitive advantage (Van de Ven, 1986), there is still only limited understanding of how employees can be stimulated to show IWB (Janssen, 2000). Based on the belief that it is employees who frame the innovative capacity of an organization through their intelligence, imagination, and creativity (Mumford, 2000), it is argued that certain HR practices can identify, develop, evaluate, and reward IWB (Ramamoorthy et al., 2005; Veenendaal & Bondarouk, 2015).

Based on the norm of reciprocity, which is central to social exchange theory (Blau, 1964), employees are expected to trade their effort and dedication in generating and implementing new ideas for tangible incentives such as pay and fringe benefits, access to training and development programs, and socio-emotional benefits such as support, care, and information sharing (Rhoades Shanock & Eisenberger, 2006). If organizations send out signals of commitment toward their employees, these employees will reciprocate with higher levels of discretionary behaviors such as IWB (McClellan & Collins, 2011; Wright & Nishii, 2013). In line with this, we argue that individual perceptions of HR practices geared toward high commitment will affect IWB. We focus on the perceptions of those HR practices that are commonly used in the high-commitment HRM literature. Veenendaal and Bondarouk (2015) observe that although there is a lack of agreement on which specific HR practices enhance high commitment (McClellan & Collins, 2011; Van Esch, Wei, & Chiang, 2016), and no list of accepted HCWPs, some HR practices do show higher associations with commitment than others. Boselie, Dietz, and Boon (2005) identified employee management activities that are commonly viewed as supporting commitment. Based on this list, and following the selection procedure proposed by Veenendaal and Bondarouk (2015), we test the effect of perceptions of the following four HR practices on IWB: compensation system, training and development, information-sharing, and supportive supervision (Boselie, Hesselink,

Pauwe, & van der Wiele, 2001). Here, rather than adopting a systems approach, we study the effect of perceptions of individual HR practices on IWB since combining the HR practices in systems loses information on why individuals behave in a certain way. Although, we accept that combining multiple HR practices in a system can deliver synergistic effects, we believe that perceptions of an entire HR system will not be sufficiently specific for our purposes as different practices are perceived in different ways and may thus not all result in IWBs. How perceptions of each of the proposed HR practices affects IWB will be discussed in the following sections where we develop related hypotheses.

Compensation system

Drawing on self-determination theory (Deci & Ryan, 1985; Gagné & Deci, 2005), rewards can be expected to reduce employees' motivation to engage in IWB, at least when their motivations are inherently intrinsic (Sanders, Moorkamp, Torka, Groeneveld, & Groeneveld, 2010). Intrinsically motivated employees may perceive rewards as pressure to do work they initially did out of interest or curiosity and this could reduce their intrinsic interest in engaging in IWB. This negative scenario was confirmed by e.g. Dorenbosch et al. (2005) and Sanders et al. (2010). Conversely, employees who are not intrinsically motivated to engage in IWB, and perceive IWB as an extra-role behavior, will expect to be rewarded for such extra effort. Zhang and Begley (2011) provided evidence for this positive effect by showing that, when organizations used compensation systems to signal to their employees that extra-role behaviors, such as IWB, were recognized and valued, the employees concerned perceived their engagement in IWB as of value. Bysted and Jespersen (2014, p. 234) argued that employees need a clear signal before they will engage in IWB because they consider IWB to be risky behavior that thus 'has to be ordered and paid for by the system.' Thus, HR practices that offer financial rewards are expected to encourage employees to innovate (Fernandez & Moldogaziev, 2012).

Based on the ideas underpinning social exchange theory, compensation positively influences IWB because employees who feel their efforts are being fairly rewarded feel obliged to reciprocate with discretionary extra role efforts, such as IWB (Janssen, 2000). Perceptions of compensation being offered by the organization may lead to a sense of obligation to provide the employer with unique knowledge and input, or with innovative suggestions for improvement (Ramamoorthy et al., 2005). Indeed, empirical results show that a compensation system can have a significant impact on innovative behavior (e.g. Bysted & Jespersen, 2014; Sanders et al., 2010; Zhang & Begley, 2011), both because it can be a tool to increase such behavior and because it can also discourage other behaviors by only rewarding innovative behaviors (Chandler, Keller, & Lyon, 2000). On this basis, our first hypothesis is formulated as follows:

H1: Employees who perceive their organization's compensation system to fairly reward their efforts will show high levels of innovative work behavior.

Training and development

Organizations can enhance their human capital through training and development practices. The relationship between training and development practices and IWB can be understood as a social exchange phenomenon in which employees experience training and development practices as an organization's commitment to their human resources, which they then feel a need to reciprocate through positive attitudes and behaviors that are not formally rewarded or contractually enforceable, such as IWB (e.g. Sanders et al., 2010).

Providing training and development will signal that the organization considers the employees concerned to be valuable and that it is willing to invest in them (Tremblay, Cloutier, Simard, Chênevert, & Vandenberghe, 2010). Employees will determine whether the opportunities to participate in training or to develop themselves are satisfactory. Benson, Finegold, and Mohrman (2004, p. 326) argue that employees will 'respond to development opportunities with positive attitudes toward the company that offers the development'. These positive attitudes will result in behavior that is valuable for both the organization and for the employee. When employees perceive training and development opportunities as helpful and valuable, they will feel better prepared for developing new ideas. Shipton et al. (2006) showed that training, compared to other HR practices, had the greatest effect on product innovation and on innovation in technical systems. Other research has similarly shown evidence for the strong positive effect of training and development practices on IWB (e.g. Knol & van Linge, 2009; Pratoom & Savatsomboon, 2012; Zhang & Begley, 2011). Based on these findings, we conclude that training and development will enhance IWB, leading to our second hypothesis:

H2: Employees who perceive their organization as facilitating training and development will show higher levels of innovative work behavior.

Information sharing

Sharing information within and between companies is beneficial because: (1) it may induce improvements by others; (2) it might lead to an advantageous standard; (3) it signals low rivalry conditions; and (4) it leads to expectations of reciprocity and reputation effects (Franke & Shah, 2003). An open system of information sharing has been found to be beneficial for innovation, especially when it is supported and stimulated by top management (Qin, Smyrniotis, & Deng, 2012). According to Vera and Crossan (2005), open information sharing is a critical aspect of participation in innovation processes because the risks of engaging in creative and spontaneous processes of improvisation are too high if teams feel they lack up-to-date information.

Employees' perceptions that information is being shared is expected to result in higher levels of IWB engagement because, if employees understand the goals

and objectives of the organization, they will identify with the organizational goals and help the organization to achieve those goals. The openness of organizational actors when it comes to organizational information may be reciprocated by employees' innovative solutions for achieving organizational goals. Research shows that organizations not communicating their goals and not encouraging employees to share information can lead to negative outcomes because employees perceive this as procedurally unfair (Bowen & Ostroff, 2004). Sharing information can increase perceived trust, support, and fairness (McElroy, 2001). This sharing particularly stimulates support for an idea in its championing stage, although it is also helpful in the initiation stage (Qin et al., 2012). If employees feel that their organization trusts them, supports them, and treats them fairly, they may sense a need to reciprocate (McElroy, 2001) through innovative behavior. This leads to the third hypothesis:

H3: Employees who perceive their organization as sharing information will show high levels of innovative work behavior.

Supportive supervision

Supportive supervision refers to the support employees perceive from their direct supervisor. It can be understood as an HR practice (Boselie et al., 2001) and as a leadership behavior (e.g. Stinglhamber & Vandenberghe, 2003) in the form of perceived supervisor support (PSS) (Eisenberger, Stinglhamber, Vandenberghe, Sucharski, & Rhoades, 2002). Boselie et al. (2001) identified supervisor support as one of five high-commitment HR practices, and understood it as the employees' perceptions that they received regular performance feedback from their supervisors. Employees feel encouraged to work hard to achieve the organization's goals if supervision is experienced as supportive, and this is in line with the aim of high-commitment HR practices. According to Janssen (2005, p. 578), employees perceive their supervisor as a key actor who has 'the power to grant or deny them the support necessary for the further development, protection, and application of their ideas'. Employees experiencing supportive supervision feel obliged to reciprocate by helping their supervisor achieve business unit goals (Rhoades Shanock & Eisenberger, 2006). This reciprocation toward their supervisor therefore increases in-role performance, and it can also lead to behaviors beyond the formal job description (Rhoades Shanock & Eisenberger, 2006). Parker, Williams, and Turner (2006) similarly found that supportive supervision is correlated with proactive work behavior and change orientation, and thus employees feeling supported by their supervisors are more likely to be innovative (Basu & Green, 1997).

De Jong and Den Hartog (2007) presented various leadership behaviors that influence employees' innovative behavior. They concluded that supervisors should provide employees with challenging tasks, provide time and money to implement ideas, show appreciation for innovative performance, and stimulate open and

transparent communication. IWB will only be stimulated if employees see possibilities for any ideas they generate to be successfully implemented. The support employees perceive for their ideas from their supervisor leads to a recognition that IWB is acknowledged, providing further stimulation.

On this basis, the fourth hypothesis is formulated as:

H4: Employees who perceive supportive supervision from their supervisor will show high levels of innovative work behavior.

Innovative climate as a moderator in the relationship between HR practices and IWB

The effect that perceived HR practices have on individual innovative behavior depends on an individual's perceptions of their work environment (James & Jones, 1976). Consequently, we assume that the relationship between HR practices and IWB will be strengthened when employees perceive a supportive climate that is beneficial to innovative behaviors.

Individuals tend to interpret situations in ways that are psychologically meaningful to them (Jones & James, 1979) and this involves idiosyncratic interpretations, generalizations, and inferences (James & Sells, 1981). According to James and Sells (1981, p. 276), 'the environment that an individual "knows" is a product of cognitive constructions, reflecting various forms of filtering, abstraction, generalization, and interpretation.' The outcome of this process of filtering and interpreting constitutes a psychological climate.

Initially, climate was seen as generic concept, embodying several dimensions of organizational practices that push employees toward having positive experiences of their workplace. However, because people encounter various events, practices, and procedures in organizations, Schneider and Reichers (1983) argued that climates needed to be 'for something' and concluded that 'to speak of organizational climate per se, without attaching a referent is meaningless' (p. 21). Thus, a more specific approach should be applied that focuses on 'criterion-oriented climates' (Jones & James, 1979, p. 203), such as a climate for innovation (Scott & Bruce, 1994) or for creativity (Van Esch et al., 2016). As such, an innovative climate is one that supports the initiation and development of new ideas, recognizes individual creativity, and is characterized by individual autonomy and ownership (Siegel & Kaemmerer, 1978).

Perceived HR practices will presumably strengthen IWB more when the employees concerned also perceive a supportive innovative climate. Based on social exchange theory arguments, an innovative climate should convey to individual employees that IWB is an organizationally valued behavior through which employees can effectively repay the firm. It indicates to employees that innovative outcomes are appreciated. Such an innovative climate is therefore likely to enhance the positive effect that HR practices can have on IWB by creating an atmosphere of creativity and risk-taking. For example, supportive supervision will result in more

innovative behavior if individuals also perceive an innovative climate in which 'initiatives can be taken without fear of reprisal and ridicule in case of failure' (Ekvall, 1996, p. 107) and have sufficient autonomy (Siegel & Kaemmerer, 1978). In this situation, employees will not only perceive their supervisor as supportive but also the wider organization because it encourages employees to be innovative and rewards them accordingly.

That is, the more that employees perceive a climate as supportive of innovation, the stronger the effect of employees' perceptions of HR practices will be on innovative behavior. This leads to our final hypothesis:

H5: An innovative climate moderates the relationship between perceived HR practices and IWB such that the positive relationships between perceptions of HR practices related to (a) the compensation system, (b) training and development, (c) information sharing, and (d) supportive supervision and IWB will be stronger when the organizational climate is perceived as supportive of innovation.

Figure 1 presents a model incorporating all the hypothesized relationships.

Method

Data collection and sample

Data for this study were collected from four manufacturing companies between May 2010 (pilot study) and July 2011. We limited the geographical scope by purposefully selecting companies in the eastern part of the Netherlands, and then identifying those engaged in innovation programs, such as a 'competences for innovation' project. This region is characterized by agricultural and manufacturing industries, with 18% of the region's workforce employed in manufacturing compared to 15% nationally. With a traditional emphasis on labor-intensive industries,

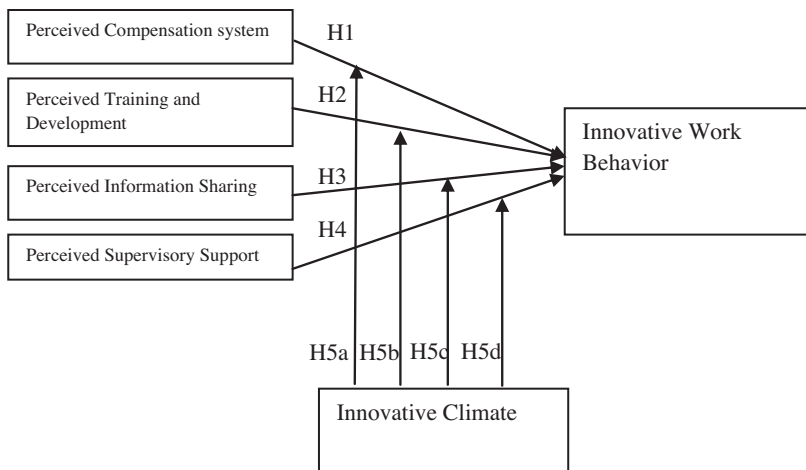


Figure 1. Model with hypothesized relationships.

including textiles, the region has experienced competition from firms in Eastern Europe, Africa, and Southeast Asia.

Manufacturing companies do not usually explicitly strive for innovative outputs, but still welcome innovative behavior and ideas from 'ordinary' employees, from shop-floor workers and professionals to middle managers (Kesting & Ulhøi, 2010). Since all organizational members can possess creative skills and problem-solving abilities, even 'routine' workers can engage in IWB. As such, providing 'an environment for idea generation' and a fostering climate, i.e. one in which there is a general acknowledgement of ordinary employees, a balanced power game between the hierarchical layers, and a tolerance of failures and the opportunity to learn from them (Kesting & Ulhøi, 2010), can support all employees in engaging in IWB, even in routinized and standardized companies.

Data were collected through a written questionnaire. We distributed questionnaires that addressed 65 variables to 585 employees in the production departments of the four companies. The targeted respondents were shop-floor production workers. In total, 463 questionnaires were returned, an overall response rate of 79.1%, ranging from 21.1 to 100% for the individual firms.

We selected production workers in manufacturing companies because such workers are generally not dedicated to achieving innovative outcomes. In such companies, it is R&D departments and their staff who usually have prescribed tasks aimed at innovation. By selecting production workers, we intended to avoid any effects due to dedicated innovation-related tasks. The identified employees received an internal communication (by mail or orally) from their line managers stressing the importance of the questionnaire. Employees were assured that participation was voluntary and that anonymity was guaranteed. In all the companies, a member of the research team was present to answer any questions but these did not extend beyond seeking minor clarifications of the procedure.

Measures

Perceptions of HR practices

In assessing perceived HR practices, we drew heavily on the high-commitment HR practice constructs of Boselie et al. (2001). In addition, items for supportive supervision were adapted from Yukl, Wall, and Lepsinger (1990). We used a five-point Likert scale, ranging from 1 = 'totally disagree' to 5 = 'fully agree' throughout.

The perceptions of four HR practices were measured: fairness and distributive justice of the compensation system (three items, e.g. 'I am not getting underpaid for my work'); training and development (three items, e.g. 'I am well prepared for my work because of the training I received from my business unit'); information sharing (four items, e.g. 'I am well informed on the vision and mission of the company'); and supportive supervision (four items, e.g. 'My direct leader is someone you can count on, even when you initiate something unsuccessfully'). All four scales were found to be reliable, with Cronbach's alphas of .70 (perceived

compensation system), .80 (perceived training and development), .81 (information sharing), and .85 (supportive supervision).

Innovative climate

To measure the innovative climate, we adopted the 'support for innovation (climate)' scale of Malik and Wilson (1995). This was based on five items, originally developed by Siegel and Kaemmerer (1978), to measure support for creativity on a five-point Likert scale ranging from 1 = 'totally disagree' to 5 = 'fully agree'. An example item is 'People in this organization are always searching for fresh, new ways of looking at problems'. The scale was found to be reliable with a Cronbach's alpha of .83.

IWB

IWB was measured using eleven items adapted from Kleysen and Street (2001) and from De Jong and Den Hartog (2010). All the items were scored on a five-point Likert scale, with possible answers ranging from 1 = 'never' to 5 = 'very often'. Each of the four dimensions of IWB outlined earlier was addressed. Three questions, adopted from Kleysen and Street (2001), concerned opportunity exploration, for example, 'Do you pay attention to non-routine issues in your work, department, organization, or the market place?' For idea generation, three items from De Jong and Den Hartog (2010) were adopted and used, for example, 'Do you generate original solutions to problems?' Two items, also adopted from De Jong and Den Hartog (2010), addressed championing: for example, 'Do you attempt to convince people to support an innovative idea?' The final three IWB items dealt with idea application, with items again adopted from De Jong and Den Hartog (2010), for example, 'Do you put effort into the development of new things?' The measurement of IWB amounted to an additive scale consisting of the items of the four dimensions (De Jong & Den Hartog, 2010). The Cronbach's alpha for the overall scale was .91, again indicating a reliable scale.

Control variables

Tenure, age, and education level are seen as potentially influencing IWB as these characteristics may be reflected in different characteristics of organizations and the way human resources are deployed. Therefore, we included these characteristics as control variables to check for potential effects. Tenure, a measure of the number of years employed in the organization, age and education level were categorized. These aspects were categorized to boost confidence in the anonymity: employees were more likely to complete the questionnaire if they could indicate categories for tenure and age rather than give exact, possibly unique, details. Finally, we controlled for the employing company using a dummy variable.

Data analysis

Given that the data were self-reported and collected at the same time through a single questionnaire, common method bias could be present causing a systematic measurement error. To check for this, we checked these conclusions using confirmatory factor analysis. To do so, we carried out an unmeasured latent methods factor analysis (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Williams, Cote, & Buckley, 1989) in which we tested a model with a common latent factor, and then compared the results with those from a model without the common latent factor. This comparison indicated a method variance of 9.6%, well below the threshold of 25% method variance suggested by Williams et al. (1989). On this basis, we conclude that common method bias is not a major issue.

We had conceptualized IWB as a one-dimensional construct, with four innovation stages addressed in a single construct, rather than as a four-dimensional construct. We carried out a confirmatory factor analysis to determine if this was true, and tested two competing models (Hair, Black, Babin, & Anderson, 2010). First, we tested a second-order four-factor model, with the items loading on to the proposed innovation stages. Next, we tested a model with the eleven items loading on to a single factor. For an acceptable fit, CFI should be greater than .90, RMSEA should be less than .08, and GFI should be greater than .90 (Hair et al., 2010). The four-factor model showed an acceptable fit in terms of CFI (.951) and GFI (.940) but the value of RMSEA (.087) was not below the threshold. The one-factor model had a better fit (CFI = .961; RMSEA = .079; GFI = .947). Therefore, we concluded that IWB is indeed a one-dimensional construct. A confirmatory factor analysis also determined that the four HR practices were indeed distinctive from each other (second-order four-factor model: CFI = .941; RMSEA = .066; GFI = .938).

Results

The means, standard deviations, and correlations for the variables addressed in this study are presented in Table 1. Multicollinearity can be ruled out as the maximum correlation between the independent variables is .54, well under the threshold of .90 (Janssen, 2000). Further, the Variance Inflation Factor (VIF) values associated

Table 1. Means, standard deviations, and correlations.

Variables	Mean	SD.	1	2	3	4	5	6
1. Compensation system	2.95	.69						
2. Training & development	3.48	.77	.39***					
3. Information sharing	3.38	.67	.25***	.54***				
4. Supportive supervision	3.61	.72	.14***	.38***	.36***			
5. Innovative climate	3.58	.61	.29***	.50***	.49***	.35***		
6. Innovative work behavior	2.99	.73	-.02	.12**	.21***	.26***	.00	

Notes: $N = 463$ (two-tailed test).

Correlation significant at $p < .05$; *Correlation significant at $p < .01$.

with the predictors are within acceptable limits at between 1.16 and 1.97 (Hair et al., 2010).

We found significant positive correlations between training and development, information sharing, and supportive supervision and IWB. However, contrary to our hypothesis, the compensation system was not significantly correlated with IWB. We also failed to find the expected positive correlation between innovative climate and IWB.

The results of the regression analyses are presented in Table 2. Model 1 includes the control variables and Model 2 further includes the direct effects of the perceived HR practices on IWB to test the first four hypotheses that address this aspect. Model 2 shows that three HR practices have significant effects on IWB: the compensation system ($\beta = -.13, p < .05$), information sharing ($\beta = .22, p < .01$), and supportive supervision ($\beta = .23, p < .01$). However, the effect of the perceived compensation system is negative, contrary to what was hypothesized, and, therefore, Hypothesis 1 is rejected. Perceptions of training and development are not significantly related to IWB, and thus Hypothesis 2 is not supported. Given the significant and positive effects of perceptions of both information sharing and supportive supervision on IWB, Hypotheses 3 and 4 are supported.

To test the moderation hypothesis (Hypothesis 5), we followed the steps suggested by Aiken and West (1991). Firstly, all the predictor variables were centered to increase the interpretability of the interactions (Aiken & West, 1991). Model 3 includes the interaction effects and the analysis shows that the interaction effect between training and development and innovative climate on IWB is significant

Table 2. Results of regression analysis, with innovative work behavior as the dependent variable.

	IWB		
	β	β	β
Step 1: Control variables			
Tenure	.05	.04	.03
Age	-.04	-.02	-.02
Education	.05	.02	.02
Company 1	-.03	-.14	-.11
Company 2	.28**	.23*	.26**
Company 3	.34**	.37***	.37***
Step 2: Independent variables			
Compensation system		-.13**	-.10
Training & development		.05	.05
Information sharing		.22***	.28***
Supportive supervision		.23***	.25***
Innovative climate			-.19**
Step 3: Interaction effects			
Compensation system \times Innovative climate			-.05
Training & development \times Innovative climate			-.17*
Information sharing \times Innovative climate			.28**
Supportive supervision \times Innovative climate			.08
ΔR^2	.05**	.12***	.03**
F	2.55**	4.97***	4.52***
R^2	.05	.17	.20
Adjusted R^2	.03	.13	.16

* $p < .1$; ** $p < .05$; *** $p < .01$.

at the .10 level ($\beta = -.17, p < .10$) and the one between information sharing and innovative climate on IWB is significant at the .05 level ($\beta = .28, p < .05$). To help interpret the significant interaction effects, we plotted the patterns of these interactions and conducted simple slope tests following Aiken and West's (1991) approach. Figure 2a depicts the interaction plot for the moderating role of innovative climate in the relationship between perceived training and development and IWB, Figure 2b similarly shows the interaction effect between perceived information sharing and innovative climate on IWB. Figure 2a shows that, in a low innovative climate, the relationship between perceived training and development and IWB is marginally significant ($t = 1.639, p = .10$), whereas in a highly innovative climate this relationship is negative but not significant ($t = -.894, n.s.$). The second plot (Figure 2b) indicates that, in a highly innovative climate, the hypothesized positive relationship between perceived information sharing and IWB is present ($t = 3.77, p < .00$) but, in a low innovative climate, the relationship is positive but not significant ($t = 1.202, n.s.$). Thus, Hypothesis 5 is supported for information sharing but not for training and development.

Discussion

The purpose of this study was to explore the effect that perceived HR practices have on the IWB of individual workers, and to examine the role that innovative climate plays in this relationship. Our findings therefore add to the work of Dorenbosch et al. (2005) who tested the effect of a perceived high-commitment work system on IWB. However, in going beyond their findings, we were able to demonstrate that perceptions of the compensation system, of information sharing, and of supportive supervision affect IWB. Perhaps surprisingly, rewarding innovative behavior results in less engagement in IWB. However, employees who perceive their organization as sharing information and supporting them, repay the organization with IWB. The effect of information sharing on IWB is stronger when employees experience an innovative climate because, in organizations that

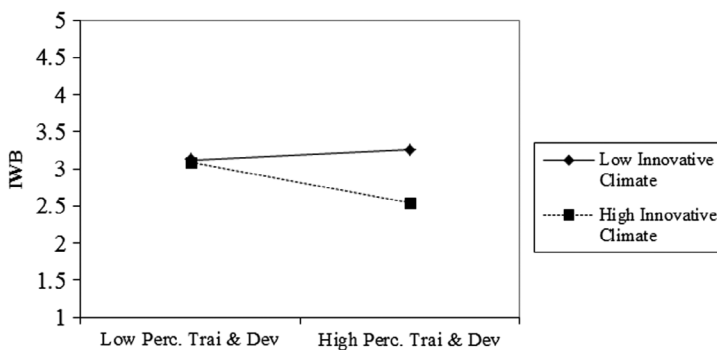


Figure 2a. Interaction plot of the moderation effect of innovative climate on the relationship between perceived training & development and IWB.

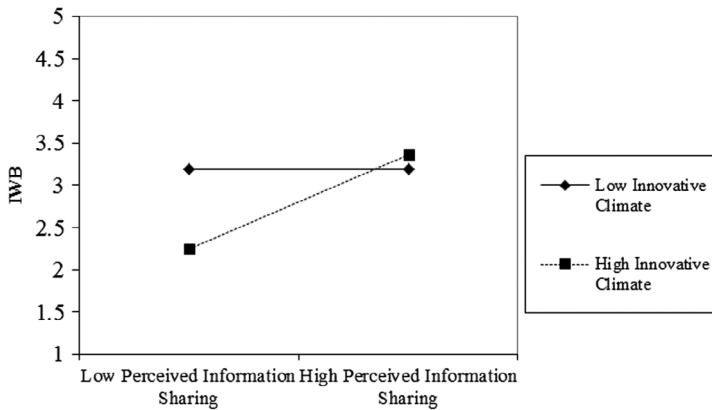


Figure 2b. Interaction plot of the moderation effect of innovative climate on the relationship between perceived information sharing and IWB.

invest in communicating an innovative climate, employees understand that they can contribute to the organizational goals by engaging in IWB.

Theoretical implications

This study has some implications for theoretical developments in IWB. Our results show that perceptions of information sharing and supportive supervision have a positive effect on IWB. Earlier studies suggested that open information sharing would facilitate IWB (Vera & Crossan, 2005), and we have now found evidence that, as Qin et al. (2012) predicted, information sharing also has positive effects on IWB. We offer strong support to the work of Basu and Green (1997) and Janssen (2005), who predicted that subordinates who experience support from their supervisors would show IWBs. Results highlight the important role that supervisors play on all levels in encouraging employees to behave innovatively (De Jong & Den Hartog, 2007). Supervisors need to share the information with employees that is necessary to allow them to be creative and innovative, but they also need to support and recognize employees' initiatives and innovative efforts in trying something new or different. As such, in order to create a positive and safe atmosphere that encourages openness and risk-taking, failures should not be punished by immediate superiors but rather seen as a learning opportunity (De Jong & Den Hartog, 2007). In this way, supervisors can create an innovative climate in their work unit (Scott & Bruce, 1994).

Although we had hypothesized that employees who perceived their compensation system as fair would exhibit greater IWB, our results show that such perceptions reduce IWB. This adds support to the self-determination theory argument that even production workers in the manufacturing sector are intrinsically motivated to engage in IWB and, consequently, perceive financial rewards as a pressure to do what they actually enjoy. Our results thus confirm the findings

of Fernandez and Moldogaziev (2012) and Sanders et al. (2010) who also found that compensation systems negatively affect IWB. That is, a compensation system perceived as encouraging IWB is only successful in stimulating extrinsically motivated employees to engage in IWB, and in fact lowers IWB in intrinsically motivated employees. Bos-Nehles, Renkema, and Janssen (*in press*), who found in their systematic literature review that rewards most often had a negative effect on IWB, explain this with the argument that discretionary efforts, such as IWB, are usually neither anticipated nor rewarded, and thus cannot be assured through compensation systems.

Our analysis suggests that perceived training and development does not affect IWB. Based on social exchange arguments, we had expected employees who perceive training and development programs to understand these programs as personalized investment in themselves, which they would then feel the need to reciprocate with something of value for the organization (Sanders et al., 2010). We further argued that there was a need for signals to inform employees about which behaviors were expected and rewarded. However, our results indicate that production workers in the manufacturing sector, maybe because of a lack of signals to indicate the value their employers place on IWB, instead seem to understand that they should reciprocate training and development with productivity or efficiency. As such, it seems that production workers will not reciprocate perceptions of training and development with IWB unless there is a climate that clearly signals the value of such behavior. This confirms the need for an innovative climate to signal to employees that training and development can be reciprocated with IWB.

Despite this logic, our results show that, in an innovative climate, the effect of training and development on IWB is negative. The job demands-resources theory (JD-R theory) (Bakker & Demerouti, 2007) offers help in understanding this effect. Both training and development and being in an innovative climate can be considered as resources that individuals can use in their work. Although the JD-R theory states that job resources result in positive work outcomes, and that it is job demands that result in negative work outcomes, other researchers have shown that job demands are positively associated with IWB (De Spiegelaere, Van Guys, & Van Hootegem, 2012; Janssen, 2000; Wu, Parker, & de Jong, 2014). Here, job demands can be understood as challenges that motivate employees to seek new ways to deal with their work (De Spiegelaere et al., 2012; Wu et al., 2014). Our production employees may have been 'made too comfortable' because they were provided with multiple job resources but no such job demands (Veenendaal & Bondarouk, 2015, p. 154). Providing employees with some job demands, such as a non-innovative climate, might help create IWB opportunities because employees could apply IWB to cope with these job demands (Bos-Nehles et al., *in press*). In an unfavorable climate for innovation, training and development opportunities could lead to IWB because, as Bakker and Demerouti (2007) found, interactions between job resources and demands are favorable for positive outcomes. This would mean that employees forced to deal with a non-innovative climate could

use training and development opportunities to engage in IWB. This explanation is supported by Neal, West, and Patterson (2005) who found that training interacted negatively with climate. They concluded that training and climate could compensate for each other, indicating that a training and development program might only affect IWB in a poor climate (here a non-innovative climate) because, in such a climate, employees have spare capacity to engage in IWB. When it comes to training and development practice, this would mean that perceptions of training and development would only result in stronger perceptions of IWB in a non-innovative climate, that is a climate unfavorable for innovation (Neal et al., 2005).

An innovative climate also moderates the relationship between perceptions of information sharing and IWB. One possible explanation for the positive interaction effect is that, in an innovative climate, employees' perceptions that information is being shared might be stronger because information and knowledge is necessarily shared for the greater goal of innovation (Vera & Crossan, 2005). That is, employees understand that they can reciprocate the openness of the organization in sharing information by displaying innovative behaviors.

Practical implications

IWB can be enhanced by strengthening the perceptions of certain HR practices. This is good news for managers as it demonstrates that desirable discretionary behaviors, such as IWB, can be boosted through information sharing and supportive supervision. Providing employees with strategic information and being transparent with organizational information will thus motivate employees to engage in IWB provided they perceive the organization as sharing information. Further, HR managers can support supervisors in being supportive by building a climate that is supportive of innovative behaviors. Employees interpret actual HR practices and HR policies based on how they are implemented by their managers (Wright & Nishii, 2013). Our findings suggest that implementers of HRM play an important role in the level of IWB. Wright and Nishii (2013) suggest that communication could be the link between actual and perceived HR practices. In line with this, we see that open communication regarding the company's strategy, the expectations the company has of its employees, and the way managers provide support for innovation all contribute to IWB.

Limitations and suggestions for future research

One limitation of this research is the reliance on cross-sectional data. In our study, all the measures were self-reported and collected at a single moment in time by a single respondent. As such, reversed causality and common method bias might be issues. For example, it could be that employees' perceptions of IWB lead to perceptions of unfair compensation rather than vice versa. If employees regard IWB as a component of job performance, rather than as discretionary behavior,

they might well expect to be rewarded for IWB (Ramamoorthy et al., 2005) and, given the non-variable pay system in Dutch manufacturing companies, they might thus perceive the compensation system as unfair. Future research could address this by adopting a longitudinal research design. Further, we believe it would be valuable to explore how supervisors assess their subordinates in terms of IWB and compare this with self-reported IWB. Gathering this additional data on employee IWB would also avoid the risk of common method bias. In our study, to address this issue, we included a Harman's single factor analysis and an unmeasured latent methods factor analysis, and both indicated that common method bias was unlikely to be a problem.

Another limitation is that our selection of HR practices is rather limited and specific. Although we believe that we selected the HR practices that best fitted the IWB situation in the Dutch manufacturing sector, it would be valuable to include additional HR practices. For example, we know from recent research (De Jong, Parker, Wennekers, & Wu, 2015) that job design characteristics, and particularly job autonomy, are strongly related to various individual innovation outcomes and behaviors. It would also be interesting to investigate whether the HR practices that lead to organizational innovation (e.g. Beugelsdijk, 2008; Laursen & Foss, 2003; Shipton et al., 2006) have the same effects on innovative behaviors, and especially IWB. Although, in this paper, we did not look for interaction effects between the different HR practices and IWB, the study by Shipton et al. (2006) provides evidence that exploratory learning moderates the effect of appraisal on product innovation and moderates the effect of training, induction, and contingent reward on innovation in technical systems. One can imagine other interaction effects between HR practices such as, in our case, between information sharing and supportive supervision. Although we earlier explained why we had doubts about investigating perceptions of an entire HR system at this stage, we believe it would be valuable to research the effect of perceived HR systems on IWB. Although Laursen and Foss (2003) did identify two HR systems that had positive effects on IWB, one of these systems consisted only of training and they did not consider employees' perceptions. As such, more research in this area would be valuable.

In studying the relationship between perceived HR practices and IWB, there is the danger of giving the impression that increasing IWB is always good for an organization. In a manufacturing company where employees are producing goods according to specifications, there is no need to have a workforce that behaves in a fully innovative manner. However, even in this context, employees do engage in IWB, for example by generating and promoting innovative ideas, participating in project teams related to innovation, or looking for ways to improve the production process. In a manufacturing context, it remains unclear whether IWB consists of incremental or radical innovative ideas, and whether these ideas result in process or product innovations. Although some authors see IWB as more related to incremental and process innovations (e.g. Devloo et al., 2015) and we know that incremental and process innovations are more common in other formalized and

centralized organizations such as the public sector (e.g. Hartley, 2005), future research could investigate the tendency towards incremental or radical, and process or product, innovative behaviors more closely. Taking a closer look at our data on IWB, it appears that production workers score themselves more highly for the creativity stage, consisting of idea exploration and idea generation, than the implementation stage, consisting of championing and application. Further in-depth research could increase understanding of how perceptions of various HR practices relate to different dimensions of IWB. Nevertheless, we believe that we have provided valuable management information concerning perceptions of which HR practices foster employees' IWB and how this could be further strengthened by investing in an innovative climate.

Disclosure statement

No potential conflict of interest was reported by the authors.

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