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High-performance work systems and firm capabilities in Korea: a fit perspective with organizational culture

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Taking a behavioral perspective on high-performance work systems (HPWS), we examine the role that organizational trust plays as a key psychological mechanism linking HPWS and firm capabilities (customer response capability and internal process capability). We further draw on configuration theory and explore how the fit between organizational culture and HPWS can be mutually reinforcing, leading to superior firm capabilities. Based on multisource data collected from 2094 employees in 500 companies in South Korea, the results show that HPWS are positively related to firm capabilities and that the link is fully mediated by organizational trust. HPWS show significant interaction effects with adhocracy, market, and clan cultures on firm capabilities but show no interaction effects with hierarchy culture. These findings highlight the importance of organizational trust and organizational culture aligned with human resource practices in the successful implementation of HPWS.

Keywords: customer response capability, high-performance work systems, internal process capability, organizational culture, organizational trust

Key points

1 High-performance work systems (HPWS) were positively related to firm capabilities (customer response capability and internal process capability) by strengthening employees' trust in the organization.
2 It is important to cultivate adhocracy, market, or clan cultures prior to implementing HPWS to achieve organizational goals.
3 Management's decisions and actions that consistently support the focus of HPWS on human capital development are likely to nurture organizational trust and thereby encourage successful implementation of HPWS.

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In the past few decades, there has been an increased emphasis in the literature on the importance of human capital as a primary source of competitive advantage (Messersmith and Guthrie 2010; Pfeffer 1998; Polyhart and Moliterno 2011). Researchers have suggested that the value of human capital can be enhanced more effectively through high-commitment or high-involvement strategies rather than control-oriented strategies (Zacharatos, Barling and Iverson 2005). More recently, the term high-performance work systems (HPWS) has been used to reflect these changes in the way human resources are managed. The concept of HPWS involves 'a group of separate but interconnected human resource (HR) practices that together recruit, select, develop, motivate, and retain employees' (Zacharatos, Barling and Iverson 2005, 77).

The extant research reveals the effectiveness of HPWS on employee and organizational performance (Ichniowski, Shaw and Prennushi 1997; Messersmith and Guthrie 2010; Sun, Aryee and Law 2007). For example, HPWS have been associated with lower turnover rates (Huselid 1995) and increased productivity, sales volume, and firm performance (Messersmith and Guthrie 2010). Furthermore, several lines of research have indicated the causal mechanisms through which HPWS influence performance outcomes (Gittell, Seidner and Wimbush 2010; Jiang et al. 2012; Takeuchi et al. 2007). For instance, HR practices can improve performance by increasing employee knowledge and skills, and the value of human capital (Polyhart and Moliterno 2011). Also, HR practices can contribute to performance by providing employees with opportunities to exert discretionary effort (McClean and Collins 2011) and by strengthening employee motivation for proactive behaviors and commitment to the employer (Chuang and Liao 2010).

Although HPWS can contribute to performance through both pathways (e.g. Appelbaum et al. 2000), we focus on the psychological processes of commitment and motivated behaviors which are triggered by HPWS. Specifically, we examine how HPWS influence firm capabilities (i.e. customer response capability and internal process capability) through employees' trust in the organization. Despite the enduring interest in the role that trust plays in organizations, only a few studies have explored the relationship between HPWS and organizational trust (Zacharatos, Barling and Iverson 2005). Since HPWS reflect the organization's commitment to enhancing the value of employee human capital, trust in the organization is likely to be enhanced.

We further extend our argument by theorizing and empirically testing the conditions that strengthen the positive effects of HPWS on firm capabilities. Drawing on configuration theory (Van de Ven and Drazin 1985), we explore whether firm capabilities are enhanced when HPWS and organizational culture are aligned (a fit perspective). In particular, we use the organizational culture typology suggested by the competing values framework (Cameron and Quinn 2006), and assume that the focus of HPWS on employee empowerment and involvement may be aligned more strongly with certain kinds of organizational culture that emphasize flexibility, autonomy, and performance than with other kinds of culture. By uncovering the kinds of organizational culture that fit with HPWS, we aim to address the call for a deeper understanding of the contextual elements

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that potentially impact the strength and direction of the relationship between HPWS and organizational outcomes.

This study extends the findings of previous research in two ways. First, we posit organizational trust as a key psychological mechanism underlying the relationship between HPWS and firm capabilities. Building on the past research that focuses on how HPWS enhance motivated behaviors (Appelbaum et al. 2000), we explore the role that organizational trust plays in fostering motivation and performance. Second, although organizational culture has a profound impact at multiple levels, to date we only have a limited understanding regarding its effect in association with HPWS. We fill this gap by examining the effect of the alignment between organizational culture and HPWS on firm capabilities.

Theoretical background and hypotheses development

HPWS

The notion of HPWS assumes that employees are a primary source of competitive advantage (Pfeffer 1998). Instead of relying on rules and regulations to manage employees, HPWS aim to increase productivity by sharing goals and information and empowering employees (Takeuchi et al. 2007). Through HR practices implemented in bundles, including participative decision-making, information-sharing, high-quality training, effective performance evaluation, and clear performance–reward linkage, HPWS reflect the organization's commitment to building its human capital and demonstrating its respect and care for the employees (MacDuffie 1995).

A growing interest in the HPWS literature is in uncovering the mediating mechanisms between HPWS and organizational outcomes (Gittell, Seidner and Wimbush 2010; Zacharatos, Barling and Iverson 2005). The assumption is that, rather than the HR practices themselves, it is the human resources developed through HPWS that create performance gains (Takeuchi et al. 2007). Several lines of research provide different perspectives on the causal mechanisms. According to human capital theory and the resource-based view of the firm, HR practices help organizations achieve performance goals by increasing the knowledge and skills of employees (Lepak and Snell 2002). For example, HPWS have been found to enhance firms' innovative performance through the selection and development of unique human capital (Cabello-Medina, Lopez-Cabrales and Valle-Cabrera 2011).

It is also possible to understand the underlying mechanism from a behavioral perspective. Such an approach suggests that effective HR practices foster employee motivation followed by proactive behaviors and discretionary effort (Bowen and Ostroff 2004). This perspective emphasizes mutual commitment between employer and employee, with the former demonstrating commitment to employee development through HPWS, and the employee in turn exhibiting commitment to the employer through prosocial (Chuang and Liao 2010) and effortful behaviors (McClean and Collins 2011), and affective

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commitment (Gong et al. 2009). Relational models by Gittell, Seidner and Wimbush (2010) extend this approach by proposing that HPWS foster interpersonal relationship building among employees, and that such relationships are the primary mechanism between HPWS and firm performance. In fact, Jackson and Schuler (1995) emphasized the importance of the behavioral perspective because the value of human capital cannot be realized unless employees are willing to use their capabilities. We take the behavioral perspective and argue that HPWS contribute to firm capability by fostering employees' trust in the organization.

Organizational culture: a fit perspective

The implementation of HPWS is beneficial for organizations (Huselid 1995; Messersmith and Guthrie 2010). However, the extent to which the implementation of HPWS is successful may be influenced by the pre-existing organizational culture. This assumption is based on configuration theory which posits that there is an ideal set of organizational and strategic characteristics that fit with each other and are mutually reinforcing, which together lead to superior performance (Van de Ven and Drazin 1985). In fact, past research has shown how the fit between the pre-existing organizational culture and organizational strategies and management systems influences their successful implementation and firm performance (Yarbrough, Morgan and Vorhies 2011). For instance, successful implementation of knowledge management technology was associated with an organizational culture of team orientation and egalitarianism which promoted collective decision-making and knowledge sharing (Park, Ribière and Schulte 2004). Meanwhile, Dikkers et al. (2004) revealed that whether an official policy of flexible work arrangements was actually used or not depended on how supportive the workplace culture was. Since organizational culture and organization-wide systems such as HPWS are purported to be deeply intertwined within an organization, it is essential to understand how the fit or misfit between organizational culture and HPWS may impact outcomes.

Organizational culture is defined as the set of shared values, beliefs and norms that influence the way employees think, feel, and behave in an organization (Schein 1985). Among the various types of organizational culture researchers have suggested (O'Reilly, Chatman and Caldwell 1991), we focus on the competing values framework developed by Cameron and Quinn (2006) since it meets our need for a comprehensive model for classifying culture which encompasses the full spectrum of organizational culture types based on a rigorous and extensive assessment of the literature. The framework's typology of organizational cultures has been widely accepted and has been used in numerous empirical studies (Goodman, Zammuto and Gifford 2001; Panayotopoulou, Bourantas and Papalexandris 2003).

Along the two dimensions that represent stability–flexibility and internal–external orientations, Cameron and Quinn (2006) propose four types of organizational culture: adhocracy, market, clan, and hierarchy cultures. Adhocracy culture represents flexibility and external focus with an emphasis on producing innovative products and adapting to new opportunities. It is characterized by a dynamic, entrepreneurial culture with

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experimentation and risk-taking. Market culture applies an external perspective in the same way as adhocracy culture, but it aimat leading the market and focuses on stability and control as a way to achieve productivity and market competitiveness. Organizations with market culture are driven by results and profits. Clan culture fosters flexibility in the same way as adhocracy culture, but its orientation is internal. Its assumption is that organizations become most effective through the development and empowerment of employees and the facilitation of participation and loyalty. Finally, hierarchy culture emphasizes stability and control in the way market culture does, but its focus is on internal aspects. It is characterized by standardized rules, control and accountability for the long-term concerns of organizational stability and efficiency. Using these four types of organizational culture, we examine how specific types of culture may strengthen or weaken the positive effects of HPWS on firm capabilities.

HPWS and firm capabilities

There is increasing evidence indicating that HPWS are associated with positive outcomes (Sun, Aryee and Law 2007; Wright, Gardner and Moynihan 2003). In this research, we specifically focus on two types of firm capabilities – customer response capability and internal process capability – to reflect both the external and internal aspects of firm capabilities. Customer response capability refers to 'the competence of an organization in serving customer needs through effective and quick actions' (Jayachandran, Hewett and Kaufman 2004, 220), which includes both effectiveness and speed in meeting customer needs. HPWS are likely to enhance customer response capability in several ways. Extensive training allows employees to acquire deeper customer knowledge and enables them to satisfy expressed and latent customer needs quickly (e.g. Slater and Narver 2009). The practice of participative decision-making fosters employees' sense of empowerment and proactivity, which enable faster decision-making (Zacharatos, Barling and Iverson 2005) that is critical in meeting customer needs with speed. Performance evaluation and incentive practices that focus on customer satisfaction and service quality are also likely to foster customer response capability (i.e. Huselid 1995). Thus, we hypothesize the following:

Hypothesis 1a: HPWS will be positively related to customer response capability.

In addition, we propose that HPWS can impact firms' internal capabilities. The internal process capability refers to the process elements that drive the organization's ability to rapidly change and innovate in response to new and changing markets (Schippmann et al. 2000). More specifically, it consists of: 1) maximized efficiency through simplified work processes, 2) financial stability through cost reduction, and 3) enhanced competence through quality improvement (Ling et al. 2012). We assume that HPWS foster internal process capability in the following ways. Through work training, employees can acquire greater competencies to manage and control their work (Barling, Kelloway and Iverson 2003), which likely results in increased efficiency and work quality. Decentralized decision-making and autonomy foster work efficiency through curtailed decision hierarchy and minimized redundancies (Kaminski 2001), which often lead to cost reduction.

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Participative management practices are associated with increased work quality through employees' proactive attitudes and behaviors (Simard and Marchand 1995). Performance evaluation and reward criteria such as the amount of cost reduction or quality improvement can help achieve the internal process capability goals (Huselid 1995). Hence, we hypothesize as follows:

Hypothesis 1b: HPWS will be positively related to internal process capability.

The effect of HPWS on firm capabilities via organizational trust

The behavioral perspective of HPWS posits that effective HRM practices contribute to organizational outcomes by fostering employee commitment and motivated behaviors (Appelbaum et al. 2000). We take this perspective and suggest organizational trust as a key mechanism between HPWS and outcomes. We assume that HPWS shape the extent to which employees perceive the organization as trustworthy or not (e.g. Collins and Smith 2006), which likely impacts motivation and commitment, and further influence performance outcomes.

We define organizational trust as 'the perception or belief by employees that their employers [and colleagues] will act upon their words' (Innocenti, Pilati and Peluso 2011, 305). Social exchange theory describes transaction processes between parties that are mutually contingent and rewarding (Thibaut and Kelley 2008). The reciprocity principle, in particular, indicates the mutual reinforcement process by involved parties where one party makes a move and the other reciprocates, thus creating a self-reinforcing cycle. In our case, HPWS indicate an employer's commitment and investments aimed at increasing the value of its human capital. In return, employees are expected to show positive behaviors and commitment to the organization (Zacharatos, Barling and Iverson 2005), which often lead to trust in the organization (Whitener 2001). Indeed, several studies have shown that organizational trust builds as a response to the employer's action, and leads to an increase in commitment to the employer (Pillai, Schriesheim and Williams 1999; Podsakoff, MacKenzie and Bommer 1996).

As McCauley and Kuhnert (1992) noted, the efficiency and fairness of organization-wide systems and practices such as HPWS tend to determine the extent to which employees trust their organization. For instance, provision of internal advancement opportunities and job security is likely to promote organizational trust because such practices indicate that the organization acknowledges the value of its employees (Patel, Messersmith and Lepak 2013). Also, information-sharing fosters organizational trust (Clarke 1999) through open discussion between management and employees. Decentralized decision-making and autonomy signals the organization's trust in its employees, which can heighten trust in the organization (Laschinger and Finegan 2005). Fairness in evaluation and compensation administration also has been found to strengthen organizational trust (Rego and Cunha 2008).

Furthermore, past research has reported predominantly positive outcomes for organizational trust, such as heightened co-operation and prosocial behaviors (Kramer 1999),

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employee well-being (Kelloway et al. 2012), and individual and firm performance (Jung and Avolio 2000). These findings together support the potential mediating effect of organizational trust from the behavioral perspective of HPWS (Bowen and Ostroff 2004). Organizational trust is likely to be heightened by the implementation of HPWS which indicates the employer's commitment to developing human capital. Employees, in return, may engage in more passionate, proactive behaviors to reciprocate the employer's commitment and trustworthiness, which ultimately can grow firm capabilities. Hence, we hypothesize as follows:

> Hypothesis 2: Organizational trust will mediate the relationship between HPWS and firm capabilities, such that HPWS will be positively related to organizational trust, which in turn will be positively related to customer response capability and internal process capability.

The moderating effect of organizational culture

While mounting evidence reveals the positive outcomes of HPWS (Messersmith and Guthrie 2010; Wright, Gardner and Moynihan 2003), only a few studies have examined the role organizational culture may play in the context of HPWS (Pichler et al. 2014; Taylor et al. 2008). Using the competing values framework (Cameron and Quinn 2006), we explore how HPWS may influence firm capabilities through the interaction with each of the four types of culture: adhocracy (innovation-driven culture), market (performance-driven culture), clan (family-like culture), and hierarchy (formality-driven culture). We use a configuration theory-based approach (Van de Ven and Drazin 1985), and argue that for the successful implementation of HPWS, the organizational culture needs to be aligned with the essential characteristics of HPWS such as the emphasis on employee development and empowerment, participative decision-making, and information-sharing.

Adhocracy culture characterized by finding creative solutions and continuous innovation has been associated with information availability and inquisitiveness (Douglas and Judge 2001). Through information-sharing and extensive training, HPWS are likely to enhance the availability of useful information and promote a highly educated workforce with autonomy and a customer orientation. In fact, HR practices involving extensive training and autonomy (Flynn, Schroeder and Sakakibara 1994) and open communication (Damanpour 1991) have been found to be effective in adhocracy culture.

Central to the market culture are values such as productivity gains, competitiveness, and quality emphasis. Such values are likely to facilitate the implementation of HPWS that emphasize efficiency and productivity – for instance, performance appraisal and performance-based pay systems. Previous findings show that market culture is associated with pay-for-performance and profit-sharing (Den Hartog and Verburg 2004).

Clan culture emphasizes the values of empowerment, mutual trust, and employee involvement. Its focus on employee growth is aligned with the assumption of HPWS that treats employees as capable individuals (Zacharatos, Barling and Iverson 2005). Hence, HPWS aimed at employee training and development seem most relevant to the orientation of clan culture. In fact, HR practices with a focus on training and employee

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empowerment have been found to be especially effective in clan and adhocracy culture (Neal, West and Patterson 2005).

Hierarchy culture with an emphasis on rules, authority, and control, however, is less likely to be aligned with the orientation of HPWS. The evidence indicates that the bureaucracy, hierarchical status, and standardization focus of hierarchy culture may not contribute to the success of HPWS, which depends on employee autonomy and continuous development. For example, formalization has been shown to result in declining innovation due to the organization's focus on process and product standardization (Aiken, Bacharach and French 1980). Bureaucratic culture has been associated with a decrease in employee discretion and proactive motivation for continuous improvement (Lagrosen and Lagrosen 2003). The focus on formality, control, and compliance appears to deter autonomy and responsibility for self-development (Della Torre and Solari 2013), which implies a potential misfit between hierarchy culture and HPWS.

Taken together, these concepts and findings suggest that three types of culture – adhocracy, market, and clan cultures – may be aligned with the subsets of HPWS, which lead to positive outcomes as compared to hierarchy culture (Figure 1). Hence, we hypothesize as follows:

> Hypothesis 3: The adhocracy, market, clan, and hierarchy cultures will each moderate the relationship between HPWS and firm capabilities.

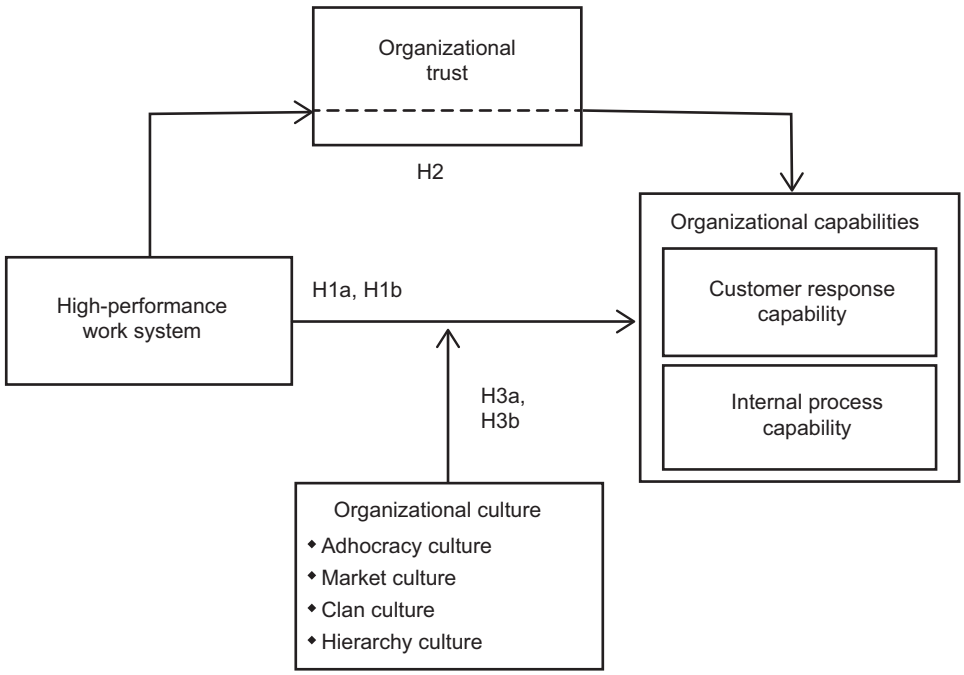


Figure 1 Research model

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Hypothesis 3a: The positive relationship between HPWS and firm capabilities will be stronger with adhocracy, market, and clan cultures.

Hypothesis 3b: The positive relationship between HPWS and firm capabilities will be weaker with a hierarchy culture.

Methods

Data collection

The data used in this study come from the 4th Human Capital Corporate Panel survey conducted in 2011 by the Korea Research Institute for Vocational Education and Training. This survey was commissioned to diagnose the current status of HR management and the development of corporations in Korea. The database has two levels: firms and individuals. The survey population includes corporations employing more than 100 workers and listed in 'KIS Corporate Data 2005', published by the Korea Information Service.

The sample in the firm level included 500 firms in three industrial sectors: manufacturing (369 firms, 74%), finance (37 firms, 7%), and service (94 firms, 19%) industries. At the individual level, the sample included 2094 employees (males: 95%, females: 5%; average tenure: 14 years; average age: 44 years). Employees in the HR department responded to the items measuring HPWS, and other variables were measured based on the responses of employees in various departments.

Measurements

Customer response capability and internal process capability

Customer response capability was measured using five items by Jayachandran, Hewett and Kaufman (2004) including 'ability to provide a quick response to a customer's need' (1 = 'strongly disagree'; 5 = 'strongly agree'). The Cronbach's α was 0.86. Four items were used to measure internal process capability including 'efficiency of work procedures' and 'competitive advantage by cost reduction' (1 = 'strongly disagree'; 5 = 'strongly agree') based on the study by Schippmann et al. (2000). The Cronbach's α was 0.92.

Organizational trust

Organizational trust was measured using three items from McAllister (1995) such as 'Our company evaluates and compensates us fairly' and 'We trust our management team' (1 = 'strongly disagree'; 5 = 'strongly agree'). The Cronbach's α was 0.84.

High-performance work systems

Four categories of HPWS were measured based on Huselid's (1995) study: training, performance evaluation, incentive compensation, and participation (see Table 1). We aggregated the average score of the four categories because each category interacts with the others, and a synergistic effect was expected (MacDuffie 1995).

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Table 1 Four categories of high-performance work systems

Category	Items	Description
Training	HRD department	HRD department dummy = 1, otherwise = 0
	Variety of training programs	The number of training/7 (total number of training programs in this survey)
	Job rotation	Have a job rotation = 1, otherwise = 0
Performance evaluation	Balanced scorecard	Have a balanced scorecard practice = 1, otherwise = 0
	Management by objective (MBO)	Have an MBO = 1, otherwise = 0
	Competency evaluation	Have a system to evaluate competency = 1, otherwise = 0
	Leadership evaluation	Have a system to evaluate leadership = 1, otherwise = 0
	360-degree evaluation	Have a 360 degree evaluation system = 1, otherwise = 0
	Other	Have other performance evaluation system = 1, otherwise = 0
Performance-based pay	Individual incentive	Individual incentive compensation = 1, otherwise = 0
	Team incentive	Team incentive compensation = 1, otherwise = 0
	Business unit incentive	Business unit incentive compensation = 1, otherwise = 0
	Firm incentive	Firm incentive compensation = 1, otherwise = 0
	Profit-sharing	Profit-sharing = 1, otherwise = 0
Participation	On-the-job training	On-the-job training = 1, otherwise = 0
	Knowledge mileage program	Knowledge mileage program = 1, otherwise = 0
	Proposal system	Proposal system = 1, otherwise = 0

Regarding the 'training' category, we standardized the number of training programs by dividing it by the maximum number. A high score means that a firm has an HRD department and a job rotation practice and consequently implements various training programs. A high score in the 'performance evaluation' category implies a high level of diversity in the performance evaluation practices. Of the five items to measure 'performance-based pay', four diagnosed whether a firm has an incentive system across diverse ranks and one item examined the availability of a profit-sharing plan. A high score indicates that various incentive practices are implemented. Lastly, a high score in the 'employee participation' category means that a firm has diverse participation channels for employees to communicate with colleagues or the firm.

Organizational culture

The four types of organizational culture were measured using three items each, utilizing a 5-point Likert-type scale (1 = 'strongly disagree'; 5 = 'strongly agree') (Cameron and Quinn 2006). The adhocracy culture was measured by items such as 'Our company offers appropriate compensation for innovative activities', and the market culture by items

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including 'Our company emphasizes a competitive atmosphere and performance'. The clan culture was measured by items such as 'Our company has a family-like atmosphere', and the hierarchy culture by items including 'Our company emphasizes formal processes, rules, and policy'.

Control variables

We controlled for tenure, gender, age, and educational level. We created dummy variables for gender (1 = 'male', 0 = 'female') and education.

Results

Table 2 shows the descriptive statistics and correlations for the variables. We found significant correlations among several predictors and control variables. Variance inflation factors (VIF) were calculated from each regression equation to check the multicollinearity. The VIF ranged from 1.04 to 1.22, which is well below the suggested cut-off point of 10, indicating that multicollinearity did not affect the results of our analyses.

We conducted Harman's one factor test to check a potential common method bias problem because the mediator and two dependent variables were surveyed from the same respondents (Podsakoff and Organ 1986). Principal component analysis was conducted on items including the independent, the mediator and the two dependent variables respectively. With customer response capability as the dependent variable, three factors had eigenvalues greater than 1. They explained 67% of the variance with the first factor accounting for 34% of the total variance. When internal process capability was the dependent variable, three factors showed eigenvalues greater than 1. They accounted for a total of 68% of the variance and the first factor explained 36% of the total variance. Through this procedure, we concluded that our data were not seriously influenced by common method bias.

In addition, we conducted a confirmatory factor analysis to check the validity of variables at the firm and individual levels. At the firm level, the factor-loading values of items to measure categories of HPWS ranged from 0.73 to 0.94, and those of items that measure the four types of organizational culture ranged from 0.64 to 0.92. All of the path coefficients of each variable were statistically significant. At the individual level, the factor loading value of items to measure organizational trust, organizational culture, customer response capability, and internal process capability ranged from 0.61 to 0.91, and all of the path coefficients of these items were statistically significant.

Hypotheses 1a and 1b predicted that HPWS would be positively associated with the two types of organizational capability: customer response capability and internal process capability. Models 3 and 6 in Table 3 show that the coefficient of organizational trust was positively and significantly related to customer response capability ($\beta = 0.346$, $p < 0.001$) and internal process capability ($\beta = 0.341$, $p < 0.001$). Thus, hypotheses 1a and 1b are supported.

In hypothesis 2, we predicted that organizational trust would mediate the relationship between HPWS and the two types of organizational capabilities. We conducted a

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Table 2 Descriptive statistics and correlations

	Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1	Customer response capability	.00	.88												
2	Internal process capability	.00	.88	.85*											
3	HPWS	.04	.72	.1*	.12*										
4	Gender	.95	.21	.00	−.01	.00									
5	Age	38.70	8.28	.06*	.07*	.03*	.24*								
6	Tenure	14.32	7.30	.08*	.09*	.13*	.13*	.73*							
7	Firm	539.46	369.34	−.05*	−.03	−.23*	−.03*	−.11*	−.19*						
8	Education	5.85	1.04	.09*	.1*	.09*	.3*	−.26*	−.17*	−.05*					
9	Industry	1.46	.79	−.06*	−.05*	.06*	−.08*	−.07*	−.1*	−.13*	.17*				
10	Adhocracy culture	.15	.81	.26*	.3*	.2*	.03*	.07*	.08*	−.06*	.07*	−.03*			
11	Market culture	.14	.78	.23*	.24*	.2*	.04*	.05*	.07*	−.08*	.12*	.05*	.65*		
12	Clan culture	.16	.82	.27*	.29*	.15*	.04*	.02*	.04*	−.08*	.12*	−.01	.68*	62*	
13	Hierarchy culture	.02	.73	.09*	.06*	.09*	.01	.00	.03*	−.05*	.11*	−.02*	.41*	.5*	.57*

$N = 2094$. *$p < 0.05$ (two-tailed).

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Table 3 Results of regression analysis: mediation model

DV	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	Organizational trust	Customer response capability			Internal process capability		
Gender	.023 (.053)	−.097 (.061)	−.087 (.064)	−.095 (.061)	−.115 (.061)	−.102 (.064)	−.111 (.061)
Age	.004* (.002)	.005** (.002)	.006** (.002)	.005* (.002)	.006** (.002)	.007*** (.002)	.006** (.002)
Tenure	.000 (.000)	.000 (.000)	.000 (.000)	.000 (.000)	.000 (.000)	.000 (.000)	.000 (.000)
Firm	−.000** (.000)	.000 (.000)	.000 (.000)	.000 (.000)	.000 (.000)	.000 (.000)	.000 (.000)
Education	.015 (.013)	.066*** (.014)	.068*** (.015)	.063*** (.015)	.070*** (.014)	.072*** (.015)	.066*** (.015)
Industry	−.022 (.02)	−.075** (.023)	−.083*** (.024)	−.076** (.023)	−.069** (.023)	−.079** (.024)	−.071** (.023)
HPWS	.202*** (.023)		.096*** (.028)	.027 (.027)		.122*** (.028)	.045 (.027)
Organizational trust		.346*** (.025)		.341*** (.025)	.394*** (.025)		.386*** (.025)
R^2	.053	.11	.03	.11	.13	.03	.13
F-value	16.68***	34.99***	8.39***	30.75***	44.44***	9.8***	39.27***
N	2094	2094	2094	2094	2094	2094	2094

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. Standard errors are in parentheses.

mediation test suggested by Baron and Kenny (1986). As a first step, we showed that the independent variable (HPWS) was significantly related to organizational trust (see model 1 in Table 3: $\beta = 0.202$, $p < 0.001$). The second step was to test the relationship between mediator and the dependent variables, which was already supported in hypotheses 1a and 1b. As a last step, models 4 and 7 showed that organizational trust was positively and significantly related to both dependent variables, while the coefficient of HPWS was no longer significant when organizational trust was introduced in the model. Therefore, these results support the full mediation effect proposed in hypothesis 2.

We conducted additional analysis of the mediation effect of organizational trust using the Sobel test (Sobel 1982). In particular, we selected the method using the product of coefficients and their difference because this approach generates a higher statistical power while maintaining control over the Type I error rate (Preacher and Hayes 2008). Table 4 displays the results of the Sobel test for the mediation effect of organizational trust on customer response capability ($Z = 4.64$, $p < 0.001$) and internal process capability ($Z = 5.42$, $p < 0.001$), which support the mediation effect proposed in hypothesis 2. Additionally, we tested whether the mediation effect was full or partial using the effect ratio in the Sobel test. The results were consistent with those of the regression analysis: the full mediation effect of organizational trust on customer response capability (effect ratio: 0.62) and internal process capability (effect ratio: 0.6) were supported.

Finally, we investigated the moderating effect of the four types of organizational culture on the relationship between HPWS and the two types of organizational capability. The results show that the interaction effects between the four types of organizational culture, with the exception of hierarchy culture, and HPWS on customer response capability are significant: adhocracy ($\beta = 0.092$, $p < 0.05$), market ($\beta = 0.073$, $p < 0.01$), and clan culture ($\beta = 0.107$, $p < 0.01$; Table 5).

The interaction effects between HPWS and the four types of organizational culture on internal process capability show a similar pattern. Except for hierarchy culture, the interaction effects between the four types of organizational culture and HPWS on internal process capability are significant: adhocracy ($\beta = 0.078$, $p < 0.05$), market ($\beta = 0.067$, $p < 0.1$), and clan culture ($\beta = 0.94$, $p < 0.01$). Thus only hypothesis 3a was supported; hypothesis 3b was not supported (Table 6).

Table 4 Sobel (1982) test of mediation effect

Mediator	c	a	σ_a	b	σ_b	Z	Effect ratio
Organizational trust (to customer response capability)	.12	.22	.00	.35	.00	4.64*	.62
Organizational trust (to internal process capability)	.14	.22	.00	.39	.00	5.42*	.6

*$p < 0.01$ (two-tailed). $Z = a \times b / \sqrt{a^2\sigma_b^2 + b^2\sigma_a^2}$ effect ratio = $a \times b/c$; where a is the effect of an independent variable on a mediator; b is the effect of a mediator on a dependent variable; and c is the effect of an independent variable on a dependent variable.

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Table 5 Results of regression analysis (DV: customer response capability)

DV	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
	Customer response capability					
Gender	−.08 (.06)	−.025 (.09)	−.024 (.09)	−.021 (.09)	−.021 (.09)	−.018 (.09)
Age	.005* (.00)	.001 (.00)	.001 (.00)	.001 (.00)	.001 (.00)	.001 (.00)
Tenure	.000 (.00)	.005 (.00)	.005† (.00)	.005 (.00)	.005† (.00)	.005 (.00)
Firm	.000 (.00)	−.000 (.00)	−.000 (.00)	−.000 (.00)	−.000 (.00)	−.000 (.00)
Education	.064*** (.01)	.094*** (.02)	.093*** (.02)	.091*** (.02)	.093*** (.02)	.092*** (.02)
Industry	−.073** (.02)	−.074** (.02)	−.071** (.02)	−.075** (.02)	−.074** (.02)	−.075** (.02)
HPWS	.012 (.03)	−.004 (.03)	.005 (.03)	−.017 (.03)	−.009 (.03)	−.018 (.03)
Adhocracy culture	.121*** (.03)	.130*** (.03)	.130*** (.03)	.132*** (.03)	.127*** (.03)	.130*** (.03)
Market culture	.091* (.04)	.081* (.04)	.084* (.04)	.088* (.04)	.084* (.04)	.087* (.04)
Clan culture	.169*** (.03)	.170*** (.03)	.170*** (.03)	.162*** (.03)	.170*** (.03)	.163*** (.03)
Hierarchy culture	−.074* (.03)	−.073* (.03)	−.077** (.03)	−.072* (.03)	−.072* (.03)	−.070* (.03)
HPWS × adhocracy culture		.092** (.03)				.048 (.05)
HPWS × market culture			.073* (.04)			−.011 (.05)
HPWS × clan culture				.107** (.03)		.088† (.05)
HPWS × hierarchy culture					.022 (.04)	−.020 (.04)
R^2	.103	.108	.103	.107	.108	.109
F-value	21.75***	21.08***	19.97***	20.8***	20.41***	16.95***
N	2094	2094	2094	2094	2094	2094

†$p < 0.1$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. Standard errors are in parentheses.

Table 6 Results of regression analysis (DV: internal process capability)

DV	Model 14	Model 15	Model 16	Model 17	Model 18
	Internal process capability				
Gender	−.063 (.09)	−.065 (.09)	−.060 (.09)	−.060 (.09)	−.060 (.09)
Age	.003 (.00)	.003 (.00)	.003 (.00)	.003 (.00)	.003 (.00)
Tenure	.005† (.00)	.006† (.00)	.005† (.00)	.006† (.00)	.005† (.00)
Firm	.000 (.00)	.000 (.00)	.000 (.00)	.000 (.00)	.000 (.00)
Education	.108*** (.02)	.108*** (.02)	.106*** (.02)	.108*** (.02)	.106*** (.02)
Industry	−.073** (.02)	−.071** (.02)	−.075** (.02)	−.073** (.02)	−.075** (.02)
HPWS	.009 (.03)	.016 (.03)	−.002 (.03)	.005 (.03)	−.003 (.03)
Adhocracy culture	.190*** (.03)	.190*** (.03)	.192*** (.03)	.187*** (.03)	.190*** (.03)
Market culture	.060† (.04)	.063† (.04)	.066† (.04)	.063† (.04)	.066† (.04)
Clan culture	.175*** (.03)	.175*** (.03)	.168*** (.03)	.175*** (.03)	.169*** (.03)
Hierarchy culture	−.108*** (.03)	−.113*** (.03)	−.107*** (.03)	−.107*** (.03)	−.107*** (.03)
HPWS × adhocracy culture	078* (.03)			.	.036 (.05)
HPWS × market culture		.067† (.03)			−.010 (.05)
HPWS × clan culture			.094** (.03)		.075† (.05)
HPWS × hierarchy culture				.038 (.04)	.003 (.04)
R^2	.128	.127	.129	.126	.13
F-value	.126	25.16***	25.74***	24.89***	20.61***
N	2094	2094	2094	2094	2094

†$p < 0.1$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. Standard errors are in parentheses.

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Discussion and conclusions

The purpose of the present study was to explore the impact of HPWS on firm capabilities through organizational trust, and to reveal the types of organizational culture that fit with HPWS. Findings from the present study expand on previous research in two ways. First, we proposed a model for the mediating process that links HPWS to firm capabilities from the behavioral perspective. Drawing on the mutual-reinforcement process of social exchange theory (Thibaut and Kelley 2008), we proposed that an organization's emphasis on investment in human capital would indicate its commitment to employee development (Ichniowski, Shaw and Prennushi 1997), which leads to increased organizational trust. Hence, we suggested organizational trust as a key causal mechanism and showed how HPWS can foster employees' trust in the organization, which eventually leads to enhanced firm capabilities. This finding adds to a growing body of research that focuses on revealing the psychological mechanisms underlying HPWS (Gittell, Seidner and Wimbush 2010; Jiang et al. 2012).

Our finding corroborates research based on-the-job demand-resources (JD-R) model which suggests that resources employees find on the job such as autonomy, fair treatment and career development opportunities promote motivation, work engagement and trust in the organization (Bakker and Demerouti 2007; Bakker et al. 2010; Demerouti et al. 2001). The practices of HPWS, including empowerment, participative decision-making and high-quality training may not only be perceived as job resources, but also have the potential to buffer the negative effects of job demands such as high work pressure and role ambiguity (Bakker, Demerouti and Euwema, 2005). Supportive supervisors or peer relationships, one of the key components of job resources, can also be built through HPWS (Gittell, Seidner and Wimbush 2010). We encourage researchers to extend the current study by drawing on the JD-R model that helps explain how the practices of HPWS enhance firm performance through the building of job resources.

Second, consistent with prior research based on the configuration theory (Van de Ven and Drazin 1985), our findings show the importance of alignment between HPWS and organizational culture in order to achieve organizational goals. Although organizational culture and organization-wide systems are known to be closely interrelated, little has been theoretically developed or empirically tested regarding the interactive effect between organizational culture and HPWS. This research takes a step toward filling that gap by identifying organizational culture profiles that fit the orientation of HPWS. We believe that the innovation and risk-taking focus of adhocracy culture fits high-performance work practices that emphasize empowerment, autonomy, and employee participation (Cameron and Quinn 2006). The efficiency and productivity orientation of market culture is likely to be aligned with the emphasis of HPWS on performance, such as objective performance measurement, pay-for-performance, and extensive training. Clan culture with its focus on inducing employee commitment and developing human resources resonates with the basic tenet of HPWS that underscores investment in human capital (Huselid 1995).

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Hierarchy culture, however, did not have any significant effect on the relationship between HPWS and firm capabilities. The focus of hierarchy culture on control, compliance, and standardization (Della Torre and Solari 2013) is likely to be at odds with HPWS that pursue empowerment, autonomy, and discretionary effort for self-development. A lack of fit between informal organizational culture and a formal organization-wide system tends to impose an extra burden on employees (Kirby and Krone 2002; Timms et al. 2015). This is because the informal message of hierarchy culture with its focus on control and compliance may compete with the formal message of HPWS oriented toward empowerment and information-sharing. We encourage researchers to further investigate the nature of the alignment between HPWS and organizational culture, in particular how each type of organizational culture is associated with specific high-performance work practices. Also, previous studies have shown the contingent effects of proportions of women and professional workers (Konrad and Mangel 2000) and employees performing core vs non-core activities (Delery and Shaw 2001) on HPWS effectiveness. Future studies may examine additional contingencies that determine the effectiveness of HPWS.

Finally, our findings have implications for business practice. Our findings offer important insights to managers that organizations need to consider the extent to which HPWS may succeed, given the culture they are embedded in. Managers may need to pay greater attention to rules, values, and HR practices to ascertain whether they are in alignment. Organizations with a strong orientation toward hierarchy, control, and standardization may invest in cultivating a culture of flexibility and empowerment by encouraging discretionary, autonomous work effort (Cameron and Quinn 2006). Fostering employees' sense of ownership through participative management and delegation practices (Jiang et al. 2012) may help the organization build a culture that fits HPWS. Therefore, prior to implementing HPWS, organizations need to promote values and beliefs of adhocracy, market, and clan cultures.

In addition, while our findings suggest that the successful implementation of HPWS breeds trust in the organization, it assumes fair and transparent administration of the systems. To nurture organizational trust, it is important for managers to be consistent in their actions and decisions (Creed and Miles 1996). Hence, management behaviors and decisions that consistently support the focus of HPWS on developing the value of human capital would be important to reinforce the positive impact of HPWS on organizational trust and thereby firm capabilities.

Our research findings need to be interpreted in light of the following limitations. First, we used a large sample of Korean firms spanning diverse industries. Given the growing interest in and demand for HPWS among Korean business organizations and managers, the context of our sample fits the research purpose. However, subsequent studies should test the effectiveness of HPWS in other contexts and cultural backgrounds to ensure the external validity of the current findings.

Second, while the current study included both manufacturing and service industries in the analysis, the performance-enhancing effects of HPWS have been found to be greater among manufacturing than service organizations. For instance, manufacturers have more

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to benefit from HPWS due to the quality focus of HPWS and employee knowledge and skill enhancement that facilitate adaptation to new machinery and procedures (Combs et al. 2006; Harley, Allen and Sargent 2007). Furthermore, different industries may weigh the relative importance of customer response capability and internal process capability differently. Future research may examine how the effect of HPWS plays out differently in different industrial sectors and explore the possibility of developing HPWS suited for specific sectors.

Third, our data were gathered at a single time point, thereby making it difficult to rule out alternative explanations for the findings. Although we attempted to address concerns about potential common method bias by collecting data from two different sources (HR departments and employees), the findings still need to be interpreted with caution. Future research may use longitudinal research designs and include more objective performance outcomes in the analyses, such as sales volume, customer satisfaction scores, or supervisor evaluations of job performance.

Finally, our sample was predominantly male. This is a fairly typical phenomenon across the manufacturing industry in Korea, which comprises 74% of the sample. Similar male-dominant samples have been used in other HPWS studies in Asian countries (e.g. Bashir et al. 2011; Chaudhuri 2009). However, several studies have reported a significant but mixed gender effect in the HPWS context. For instance, HPWS including work–life balance programs had a stronger positive impact on productivity when women comprised a larger percentage of the workforce (Konrad and Mangel 2000). On the other hand, men were more committed than women when organizations implemented HPWS (Qiao, Khilji and Wang 2009) partly due to the fact that women had fewer chances to participate in training and be included in fair reward schemes (Heywood and Jirjahn 2002). Given these mixed findings, future research would benefit by confirming the findings of the current study with a more balanced gender sample.

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