

HUMAN RESOURCE SYSTEMS, EMPLOYEE CREATIVITY, AND FIRM INNOVATION: THE MODERATING ROLE OF FIRM OWNERSHIP

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This inter-human resource (HR) systems research investigates *whether, how, and when* different types of employee-experienced HR systems jointly influence employee creativity. We hypothesize and find that employee-experienced performance-oriented HR systems were more positively related to employee domain-relevant skills when employees experienced stronger maintenance-oriented HR systems. In addition, employee-experienced maintenance-oriented HR systems more strongly augmented the positive relationship between employee-experienced performance-oriented HR systems and domain-relevant skills in privately owned enterprises (POEs) than in state-owned enterprises (SOEs). Employee domain-relevant skills mediated the three-way interactive effect of employee-experienced performance-oriented HR systems, maintenance-oriented HR systems, and firm ownership (POEs vs. SOEs) on employee creativity. Finally, aggregated employee creativity had a stronger positive relationship with firm innovation in POEs than in SOEs. As such, this investigation provides novel theoretical and empirical insights into strategic HR systems, creativity, and innovation.

As Chinese companies become more competitive in innovation, they increasingly worry about potential obstacles to further innovation growth. The [2013 China innovation] survey shows that access to talent, retention of talent, and rapid cost increases are all key

concerns for innovation in the future. *Bill Peng,*
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A critical global trend in strategic human resource management (SHRM), especially in emerging economies (e.g., China) that are striving to become innovation-based, is to design and implement HR systems that boost employee creativity (The Economist Intelligence Unit, 2015). China aspires to move from being the world's manufacturer ("made in China") to become the world's innovator ("created in China") (Casey & Koleski, 2011). To achieve this transition, it is crucial to unleash employee creativity (i.e., the generation of novel and useful ideas), which is the micro-foundation of firm innovation (Liu, Chen, & Yao, 2012). Curiously, and despite the fact that HR systems are ubiquitous and employee creativity is potentially subject to their influences (Zhou & Shalley, 2008), research on HRM and employee creativity remains scant. Prior studies

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(e.g., Gong, Huang, & Farh, 2009; Liu, Liao, & Loi, 2012) have mostly focused on the role of individual, leadership, and team factors in predicting employee creativity (Anderson, Potočnik, & Zhou, 2014). Also, as emphasized in a recent review of the SHRM literature, “most studies of HRM systems have focused on the domestic operations of organizations in Western cultures; insights into the dynamics of SHRM in Eastern cultures (e.g., China) are just beginning to appear” (Jackson, Schuler, & Jiang, 2014: 32). Hence, this research intends to examine *whether, how, and when* HR systems may influence employee creativity, thereby contributing to an in-depth understanding of the functioning of HR systems with respect to employee creativity in emerging economies such as China.

Answering the continued call for contextualization of management research (Barkema, Chen, George, Luo, & Tsui, 2015; Tsui, 2007), we focus on Gong, Law, Chang, and Xin’s (2009) dual-concern model of HR systems, which was developed according to the maintenance–production subsystems distinction (Katz & Kahn, 1978), and the characteristics of the Chinese context. Deeply influenced by the socialist ideology, HR systems in China have traditionally upheld maintenance-oriented HR systems that refer to a set of internally consistent HR practices that protect employment security and status equality (the so-called “iron rice bowl”) (Ding, Lan, & Warner, 2001). The reforms since 1978 have given rise to performance-oriented HR systems, which comprise of a set of internally consistent HR practices that develop employee work-related skills and motivation and provide opportunities for their utilization (Zhu, Cooper, De Cieri, & Dowling, 2005). In 2008, China started enforcing a new national labor law, which “compels firms to establish formalized HRM policies, processes, and systems, shifting from informal and perhaps more arbitrary management to formal rule-based management” (Liang, Marler, & Cui, 2012: 57). As a result, both maintenance- and performance-oriented HR systems exist in state-owned enterprises (SOEs) and privately owned enterprises (POEs) (Gong, Law, et al., 2009; Liang et al., 2012). For example, both SOEs and POEs are required by China’s Labor Contract law to offer employees an open-term contract after two contract renewals (Harris, 2010) and to provide job training to employees (Ministry of Commerce of China, 2007). Kooij, Jansen, Dijkers, and De Lange’s (2010) meta-analysis of SHRM supported Gong, Law, et al.’s (2009) conceptualization of performance- and maintenance-oriented HR systems.

In line with recent advances in the SHRM literature (e.g., Den Hartog, Boon, Verburg, & Croon, 2013; Jensen, Patel, & Messersmith, 2013; Jiang, Hu, Liu, & Lepak, 2015), this study focuses on *whether* an employee’s experience of performance- and maintenance-oriented HR systems affects his or her creativity. This is because “employees may perceive or experience differences in exposure to work practices” (Liao, Toya, Lepak, & Hong, 2009: 274). The studies on idiosyncratic deals have shown that in both developed and emerging economies, employees from the same firm experience different HR arrangements (e.g., some employees enjoy more job security and development opportunities) (e.g., Liu, Lee, Hui, Kwan, & Wu, 2013; Rousseau, 2005). As reiterated by Nishii, Lepak, and Schneider (2008: 528), “meaningful variability exists within organizations—in terms of employees’ perceptions of and reactions to HR practices—and that implicitly ignoring this variability by focusing on single organizational respondents’ reports of HR practices in their organizations may be hurting our ability to understand the process through which HR practices become linked to performance.” An employee’s experience of HR systems has the most direct influence on his or her behaviors (Den Hartog et al., 2013; Jensen et al., 2013). Hence, research examining the impact of an employee’s experience of HR systems on his or her outcomes is sorely needed (Wright & Nishii, 2013).

In order to better understand the effect of employee-experienced HR systems on employee creativity, there is a strong need to study *how* employee-experienced HR systems may lead to employee creativity (i.e., the mediating mechanism) (Jiang, Takeuchi, & Lepak, 2013). The SHRM literature suggests that performance-oriented HR systems develop employees’ job-relevant knowledge and skills (Wright, Dunford, & Snell, 2001), which are referred to as domain-relevant skills in the creativity literature (Amabile, 1988). The componential theory of creativity has highlighted domain-relevant skills as a core driver of creativity (Amabile, 1996). Interestingly, empirical research has predominantly focused on intrinsic motivation as the explanation for contextual influences on creativity (Liu, Jiang, Shalley, Keem, & Zhou, 2016; Shalley, Zhou, & Oldham, 2004). By contrast, the role of domain-relevant skills has received little attention. This is a critical oversight because intrinsic motivation and domain-relevant skills are both considered mechanisms underlying creativity in the componential theory of creativity (Amabile, 1988, 1996). Therefore, by integrating the SHRM literature and the componential theory of creativity, this research

investigates whether employee domain-relevant skills may mediate the relationship between employee-experienced HR systems and creativity beyond intrinsic motivation.

While most SHRM research has routinely taken a universal approach and focused on the main effects of HR systems, a recent review of the SHRM literature suggests that a fertile area for future research is to take a contingency approach to understanding *when* HR systems may function more or less effectively (Jackson et al., 2014). Despite the recognition that the effects of different HR systems may be contingent on each other and the call for examining potential synergy among different HR systems (Jiang, Lepak, Hu, & Baer, 2012), the interplay between different HR systems has curiously received little attention. Although research has shown that diverse HR practices within a given type of HR system may create synergy and thus exert a stronger effect on firm performance than individual HR practices alone (Combs, Liu, Hall, & Ketchen, 2006), the potential interface among different types of HR systems remains unexamined. This omission is problematic because multiple types of HR systems co-exist in firms (e.g., Gong, Law, et al., 2009; Kooij et al., 2010). Thus, the systems perspective of SHRM can be further extended by investigating how different types of HR systems work together to generate synergy.

Accordingly, we first examine the positive *moderating* effect of employee-experienced maintenance-oriented HR systems on the link between employee-experienced performance-oriented HR systems and domain-relevant skills. Person-organization (P-O) fit theory and relevant SHRM research reveal that employees respond more favorably to experienced organizational practices that meet their needs, which results in more positive workplace attitudes and behaviors (Kristof, 1996; Nishii & Wright, 2008). Employees have both higher- and lower-order needs that may be satisfied by their organizations (Alderfer, 1969, 1972). Performance-oriented HR systems meet employees' higher-order needs (e.g., skill development and career advancement) and thus drive productive activities and outcomes, while maintenance-oriented HR systems meet employees' lower-order needs (e.g., job security and workplace equality) and thus maintain the stability of HR (Gong, Law, et al., 2009; Katz & Kahn, 1978). The fulfillment of lower-order needs can facilitate the emergence and satisfaction of higher-order needs (Alderfer, 1969, 1972; Hagerty, 1999). Hence, we posit that because the two HR systems complement each other to meet employee needs at different

levels, they should interact positively with each other to facilitate the development of employee domain-relevant skills and, subsequently, creativity.

To further leverage the contingency perspective of HR systems and delve into the Chinese context, we also examine whether employee-experienced maintenance-oriented HR systems and firm ownership jointly moderate the relationship between performance-oriented HR systems and domain-relevant skills, which subsequently lead to employee creativity. Firm ownership is fundamental to a firm's operation, and, hence, is well-positioned to moderate the impact of a firm's HR systems (Boeker & Goodstein, 1993). In particular, firm ownership has been identified as a primary institutional factor in emerging economies like China because employees and their firms receive different treatment from the external government depending on firm ownership (Park & Luo, 2001). In Western economies, most firms are owned by private citizens (i.e., POEs) instead of by the state, whereas in China's emerging economy, SOEs remain influential, despite the growing private sector (Curran, 2015). In emerging economies, POEs and SOEs are two major firm ownership types with distinct external institutional protection (Peng, Wang, & Jiang, 2008). Compared to employees working for POEs, those working for SOEs receive greater employment and equal rights protection from the broader external institutional environment (e.g., government agencies) (Sheng & Zhao, 2012). Hence, according to P-O fit theory and SHRM research (Kristof, 1996; Nishii & Wright, 2008), employees from POEs rely more on their experienced internal maintenance-oriented HR systems than their counterparts in SOEs. The moderating effect of maintenance-oriented HR systems on the relationship between performance-oriented HR systems and domain-relevant skills should thus be stronger in POEs.

Finally, it has long been assumed that employee creativity is the micro foundation of firm innovation—the development and launch of new products (Kanter, 1988)—which leads to competitive advantages. But important questions remain: does aggregated employee creativity enhance firm innovation, and, if so, does firm ownership alter this link? Addressing these research questions is critical. First, a key SHRM theoretical assertion is that HR systems bring competitive advantages that usually result from firm innovation (Becker & Huselid, 2006; Lado & Wilson, 1994). Research linking employee-experienced HR systems to employee creativity and, subsequently, firm innovation provides much needed insight into the micro

foundation for the assertion (i.e., employee creativity) (Anderson et al., 2014). Second, from a P-O fit theoretical perspective (Chatman, 1991), POEs and SOEs may have different levels of need for internal employee creativity, thereby differing in the extent to which they utilize employee creativity. Hence, it is meaningful to examine whether the employee creativity–firm innovation relationship is contingent on firm ownership. Third, the development of a multilevel theory of creativity will remain incomplete if we focus only on the predictors of employee creativity, but exclude whether and when employee creativity translates into firm innovation.

In sum, first, this study not only shows that employee-experienced HR systems are related to employee creativity while controlling for leadership and climate factors, but also reveals employee domain-relevant skills as a unique mechanism beyond the dominant intrinsic motivation perspective (Liu et al., 2016). Second, using the Chinese context to contribute to the global knowledge of SHRM, we reveal that the functioning of employee-experienced performance-oriented HR systems is contingent on both employee-experienced maintenance-oriented HR systems and firm ownership. Further advancing the systems perspective of SHRM, we show that two different types of HR systems, performance- and maintenance-oriented HR systems, interact synergistically to influence domain-relevant skills and subsequently creativity (Zhou & Hoever, 2014). Having a mix of SOEs and POEs, China presents a unique context for examining firm ownership as a boundary condition for the impact of HR systems on employee creativity. The implication goes beyond China because a mix of SOEs and POEs exist in a number of countries, and SOEs represent approximately 10% of global gross domestic product (Bruton, Peng, Ahlstrom, Stan, & Xu, 2015). Third, we advance multilevel SHRM and creativity theory by unveiling that aggregate employee creativity does translate into firm innovation, but to different degrees in SOEs versus POEs in China, an insight missing from research in the West.

THEORY AND HYPOTHESES

The Joint Influence of Employee-Experienced Performance- and Maintenance-Oriented HR Systems on Employee Domain-Relevant Skills

The SHRM literature emphasizes the importance of configuring HR practices into systems of internally consistent HR practices (e.g., performance- and maintenance-oriented HR systems). Compared

to a piecemeal HR strategy, systems of internally consistent HR practices can produce synergy and be more effective in generating positive employee outcomes (Combs et al., 2006; Wright & Boswell, 2002). To further the systems notion of SHRM, we take a contingency perspective of SHRM (Jackson et al., 2014; Miles & Snow, 1984) and build on P-O fit theory and research (Kristof, 1996; Kristof-Brown, Zimmerman, & Johnson, 2005) to investigate how two different types of HR systems (performance- and maintenance-oriented) experienced by employees jointly affect employee domain-relevant skills.

Drawing on P-O fit theory and the SHRM literature, we first contend that employee-experienced performance-oriented HR systems are significantly related to employee domain-relevant skills. P-O fit theory suggests that “from the needs-supplies perspective, P-O fit occurs when an organization satisfies individuals’ needs, desires, or preferences” (Kristof, 1996: 3). When employees experience HR systems that meet their needs (i.e., in the presence of P-O fit), they will respond favorably and thus engage in desired behaviors intended by those HR systems (Nishii & Wright, 2008). Given that performance-oriented HR systems satisfy employees’ needs for skill development and career advancement (Gong, Law, et al., 2009), employees will respond favorably when they experience such HR systems and engage in activities that develop domain-relevant skills. For instance, exposure to the HR practices of career planning and advancement under performance-oriented HR systems may cause employees to perceive that their companies honor their need for career advancement, which, as a result, may encourage employees to sharpen their job-relevant skills in order to achieve desirable career progress (Noe, Hollenbeck, Gerhart, & Wright, 1997). Similarly, HR practices that foster participation in work-related decision-making provide employees with desired opportunities to develop, share, and learn job-related skills (Batt, 2002). Employees’ domain-relevant skills can also be cultivated by their experiences with and positive reactions to extensive training HR practices, which help employees master the skills needed for completing jobs effectively (Youndt & Snell, 2004). Also, under the influence of developmental appraisal HR practices, employees can understand how to further enhance their domain-relevant skills to accomplish jobs effectively through the receipt of regular and useful feedback on their performance (Bretz, Milkovich, & Read, 1992). Taken together, employees’ experiences of the HR practices in performance-oriented HR systems should facilitate their development of domain-relevant skills.

SHRM scholars have emphasized that the functioning of HR systems depends on all of the system's elements together (e.g., Jackson et al., 2014; Miles & Snow, 1984). Further, because employees can be motivated by multiple needs at the same time (Alderfer, 1969, 1972), P-O fit theory and related SHRM research imply that different HR systems will synergistically influence employees if they simultaneously fulfill multiple employee needs (Kristof, 1996; Nishii & Wright, 2008; Schneider, Kristof-Brown, Goldstein, & Smith, 1997). Specifically, employees have both higher-order needs, such as skill development and career advancement, that performance-oriented HR systems can meet, as well as lower-order needs, such as protection of job security and workplace equal rights, that maintenance-oriented HR systems can satisfy (Gong, Law, et al., 2009; Sirgy & Wu, 2009). Research also suggests that fulfilling lower-order needs fosters the emergence and satisfaction of higher-order needs (Alderfer, 1969, 1972; Hagerty, 1999). As such, the presence of maintenance-oriented HR systems makes performance-oriented HR systems more powerful in enticing positive behavioral responses. The journey toward mastering domain-relevant skills involves risks and costs, including making errors and consuming time and energy. As a result, employees' experiences of job security and equal rights due to strong maintenance-oriented HR systems should propel them to more fully espouse the experienced performance-oriented HR systems that advance domain-relevant skills.

In contrast, when employees experience weak maintenance-oriented HR systems, they may feel that their job security is in jeopardy and that their equal rights are not protected. Consequently, they may feel that the risks and costs associated with mastering domain-relevant skills are not worthwhile, and therefore will have lower drive. In other words, performance-oriented HR systems will be less effective in the development of employees' domain-relevant skills if the organization lacks maintenance-oriented HR systems. The above arguments suggest that employees' experiences of the two different and complementary types of HR systems, performance- and maintenance-oriented, should interact positively to facilitate employee domain-relevant skills.

Hypothesis 1. Employee-experienced maintenance-oriented HR systems moderate the positive relationship between employee-experienced performance-oriented HR systems and employee domain-relevant skills such that the

relationship is stronger when employee-experienced maintenance-oriented HR systems are stronger.

The Joint Influence of Employee-Experienced Performance- and Maintenance-Oriented HR Systems and Firm Ownership on Employee Domain-Relevant Skills

Building on Hypothesis 1, we further reason that employee-experienced maintenance-oriented HR systems and firm ownership may jointly moderate the relationship between employee-experienced performance-oriented HR systems and domain-relevant skills. Despite the rapid development of POEs, SOEs still have a significant presence in the Chinese economy and account for 17% of urban employment, 22% of industrial income, and 38% of China's industrial assets (Curran, 2015). Park and Luo (2001: 459) highlight that "organizations in China receive different treatment and resource allocations from the government depending on their institutional and organizational orientations, such as ownership." A recent review of SHRM studies in China concluded that "most of the Chinese studies control for ownership rather than considering it a potential boundary condition. Thus, with few studies specifically comparing the utility of SHRM across types of ownership, there is room for more research" (Liang et al., 2012: 66). Moving beyond extant research, we posit that the strength of the moderating effect of employee-experienced maintenance-oriented HR systems proposed in Hypothesis 1 may differ between SOEs versus POEs; specifically, employee-experienced maintenance-oriented HR systems should amplify the impact of employee-experienced performance-oriented HR systems on domain-relevant skills more in POEs than in SOEs.

In addition to the protections provided by internal maintenance-oriented HR systems, SOE employees' employment security and equal rights are also protected by external institutional arrangements. Due to lingering socialist ideology and concern with political stability, central and local Chinese governments still place a high priority on protecting employment security and equal rights of SOE employees, who constitute the labor force representing Chinese socialism (Gang & Hope, 2013; Wong, Wong, Ngo, & Lui, 2005). Thus, even when SOE employees are laid off owing to SOEs' financial difficulty in market competition, they can still enjoy the protection from local governments, the Chinese communist party's

district administrative committees, and other government agencies such as labor bureaus and reemployment centers (Wong & Ngok, 2006). These government agencies and the Chinese communist party's committees are responsible for securing new jobs for them (e.g., transfer to other SOEs) and granting them medical insurance and pensions (Mok, Wong, & Lee, 2002; Wong & Ngok, 2006). For example, the state administration of taxation has offered tax incentives for laid-off SOE workers that start their own businesses (Xu, 2004). In May 2015, the State Council of China announced that R&D personnel in SOEs are allowed to take non-paid leave up to three years to start new ventures (Zhao, 2015). Moreover, SOE employees are members of the Chinese communist party's trade union, which is independent from their firms' HR systems; when SOE employees' equal rights are violated, the trade union can step in and ensure SOE employees are treated properly (Chen, 2003; Sheng & Zhao, 2012). In contrast to their counterparts in SOEs, POE employees do not enjoy the above external institutional protection independent from their firms' internal maintenance-oriented HR systems (Tsai, 2007).

To sum up, employees in both SOEs and POEs have needs for employment security and equal rights protection (Sheng & Zhao, 2012; Tsai, 2007). Yet, employees from POEs are exposed to much less support and protection from the external institutional environment beyond POEs' internal maintenance-oriented HR systems. As a result, internal maintenance-oriented HR systems should be more influential and important for employees from POEs than SOEs. Nishii and Wright (2008: 233) pointed out that "the favorability of an HR practice depends on its perceived instrumentality in helping individuals to accomplish personal goals or satisfy personal needs." More specifically, the needs-supplies perspective of P-O fit and related SHRM research indicate that when HR systems align more with employee needs, they will be better situated to stimulate desirable employee attitudes and behaviors (Kristof-Brown et al., 2005; Nishii & Wright, 2008). That is, the more instrumental HR systems are in satisfying employee needs, the more influential they are to employees (Nishii et al., 2008).

Hence, maintenance-oriented HR systems should be critical in meeting POE employees' needs for job security and equal rights protection. In contrast, SOE employees' needs for employment security and equal rights can be met by not only internal maintenance-oriented HR systems but also external institutional arrangements. Consequently, SOE employees would

respond less strongly to exposure from their firms' internal maintenance-oriented HR systems. Taken together, the above theorizing and Hypothesis 1 suggest that employee-experienced maintenance-oriented HR systems should accentuate the positive association between employee-experienced performance-oriented HR systems and domain-relevant skills to a greater extent in POEs than in SOEs.

Hypothesis 2. Employee-experienced maintenance-oriented HR systems and firm ownership jointly moderate the positive relationship between employee-experienced performance-oriented HR systems and employee domain-relevant skills such that in POEs, employee-experienced maintenance-oriented HR systems will more strongly augment the relationship.

Domain-Relevant Skills Mediate the Interactive Effect of Employee-Experienced Performance- and Maintenance-Oriented HR Systems and Firm Ownership on Creativity

Creativity theorists have identified domain-relevant skills as a key mechanism linking personal and contextual factors to employee creativity (Amabile, 1988). Specifically, skills underlying employee creativity are often domain specific (i.e., the factual knowledge and the technical skills required in a given domain; Amabile, 1996). Domain-relevant skills not only help with problem identification, but also provide the cognitive pathways for problem resolution. The stronger the domain-relevant skills, "the more numerous the alternatives available for producing something new, for developing a new combination of ideas" (Amabile, 1996: 85). That is, domain-relevant skills determine *what* employees can do in the creative process (Amabile & Pillemer, 2012). With more domain-relevant skills, an employee is more likely to have a good understanding of the root cause of a problem and combine and recombine different sets of knowledge to produce a creative solution. Employees with strong domain-relevant skills also possess a wealth of resources to leverage when handling new challenges creatively. In a critical review and synthesis of prior research, Weisberg (1999) concluded that knowledge and skills obtained through extensive training and practice significantly enhance creativity.

Qualitative and quantitative reviews of prior SHRM studies have also implied that employees' human capital may mediate the relationship between HR

systems and employee outcomes (e.g., Jiang et al., 2013; Jiang et al., 2012). For example, building on an in-depth review of studies on HR systems, Jackson and colleagues (2014: 21) summarized that “HRM systems mostly influence employees’ human capital (skills and abilities) and motivation (as indicated by various job-related attitudes), which in turn contribute to improved operational performance, and thus improved outcomes for customers and owners/investors.” Interestingly, little empirical research has tested the mediating role of employee domain-relevant skills in the relationship between employee workplace experiences and creativity. Taking the above theorizing and Hypothesis 2 together, we propose that employee domain-relevant skills function as a mediator to channel the three-way interaction among employee-experienced performance- and maintenance-oriented HR systems and firm ownership into employee creativity.

Hypothesis 3. Employee-experienced performance- and maintenance-oriented HR systems and firm ownership interact to affect employee domain-relevant skills, which in turn lead to employee creativity.

The Joint Influence of Aggregate Employee Creativity and Firm Ownership on Firm Innovation

While SHRM scholars have proposed that employee experiences of HR systems precede employee behaviors, which ultimately bring about organizational outcomes (Bowen & Ostroff, 2004; Wright & Nishii, 2013), the relationships among employee-experienced HR systems, employee creativity, and firm innovation have yet to be examined by empirical studies. So far, our Hypotheses 1 to 3 have delineated whether, how, and when employee-experienced HR systems impact employee creativity. To further extend the SHRM literature, we also investigate *when* aggregate employee creativity will be more or less related to firm innovation depending on firm ownership. Creativity and innovation research has stressed the notion that “employees’ creativity is often the starting point for innovation” (Zhou & George, 2001: 683). However, there has been no empirical research examining the relationship between aggregate employee creativity and firm innovation. Scholars have recently pointed out that a central problem in the study of innovation is the missing elucidation of situations where creative ideas are better implemented and transformed into firm innovation (Gong, Zhou, & Chang, 2013).

P-O fit theory suggests that “fit occurs when an individual has the abilities required to meet organizational demands” (Kristof, 1996: 3) in addition to when the organization meets the employees’ needs. When P-O fit occurs (i.e., employees can provide what their organization demands or vice versa), positive outcomes will accrue to both organizations and employees (Chatman, 1991). Prior empirical studies on P-O fit tended to concentrate on employee outcomes such as job satisfaction and organizational commitment (e.g., Verquer, Beehr, & Wagner, 2003). Yet, according to P-O fit theory (Chatman, 1991; Schneider et al., 1997), when employees are able to offer what their organization demands, they are more likely to influence organizational outcomes. We contend that employee creativity in aggregation should be more strongly associated with firm innovation in POEs, which are more in need of *internal* employee creativity.

The Chinese government has been advocating for the innovation-based economic growth model, and, thus, has been pushing SOEs and POEs to adopt the model (Lan, 2015). Yet, SOEs and POEs respond to this push differently when it comes to the utilization of *internal* employee creativity for the purpose of innovation. SOEs have better access to *external* creativity than POEs, which face certain forms of discrimination in the Chinese institutional environment (Choi, Lee, & Williams, 2011; Guan, Yam, Tang, & Lau, 2009; Li & Atuahene-Gima, 2001). In particular, SOEs have more opportunities to take advantage of inventions and discoveries from *external* universities and research institutes, most of which are state-owned in China. The Chinese government has enacted policies, regulations, and rules to encourage universities and research institutes to collaborate with SOEs to generate innovative products. Hence, compared to POEs, SOEs have less need to turn *internal* employee creativity into firm innovation.

Although POEs have evolved to become a major economic player in China, compared to SOEs, they still have to rely more on utilizing their *internal* human resources to accelerate firm innovation due to continued institutional discrimination (Ding & Warner, 1999; Garnaut, Song, Yao, & Wang, 2012). Tapping into *internal* employees’ creativity is a viable (and perhaps the most important) strategic choice for POEs because they face greater market competition and have less access to *external* creativity than SOEs. In line with P-O fit theory (Chatman, 1991; Kristof, 1996; Schneider et al., 1997), employee creativity is more likely to be utilized and turned into

firm innovation in POEs because it better fits with and serves the demand of POEs.

Hypothesis 4. Firm ownership moderates the positive relationship between aggregate employee creativity and firm innovation such that the relationship is stronger in POEs than in SOEs.

METHODS

Participants and Procedure

Our target sample was 137 metallurgical firms in a Northeastern province of China. With the endorsement and support from a corporate management research institute directly affiliated with the provincial government, we were able to have 57 (30 SOEs and 27 POEs) of the 137 firms participate in our research. Following Collins and Smith (2006), we asked participating firms' senior HR executives to *randomly* select a list of 15 core knowledge employees from their research and development (R&D) departments and provide these employees' email addresses. We provided a definition of core knowledge employees as those who are critical to knowledge creation and development of innovation in their firms (Collins & Smith, 2006; Hislop, 2005). When examining employee creativity, scholars tend to focus on core knowledge employees who are the group of employees most important for firm innovation and thus the most meaningful to study (De Jong & Den Hartog, 2007; Dul, Ceylan, & Jaspers, 2011; Hirst, Van Knippenberg, & Zhou, 2009). To encourage participation, we provided a gift card of 100 Chinese Yuan (about 16 U.S. dollars) to each respondent who participated in our online survey, which lasted two months and included three phases.

At phase 1, we administered an online survey (a link sent via email) to 855 core knowledge employees to survey their experienced performance- and maintenance-oriented HR systems (i.e., rating HR practices according to their own experiences), empowering leadership, support for innovation climate, and demographics. Among them, 641 replied to our survey. One month later, at phase 2, we surveyed the 641 respondents on their domain-relevant skills, intrinsic motivation, and self-efficacy. We obtained responses from 523 employees. At phase 3 (i.e., two months into our data collection), we emailed the 523 responding employees' supervisors who were R&D department heads (all employees from a given firm were evaluated by one supervisor) and asked them to complete an online survey to

assess their employees' creativity. We received 363 creativity assessments; 11 assessments were not included in the data analysis due to missing data. Hence, our final sample had 352 employees with matched data from 57 supervisors in 57 firms (i.e., one supervisor per firm; on average, 6.18 employees were rated by one supervisor). At Phase 4 (i.e., one year after phase 3), we contacted the 57 firms' R&D departments for data regarding the number of new products launched in the year prior to our phase 1 data collection and the year after our phase 3 data collection. We were able to collect data from 50 firms (27 SOEs and 23 POEs).

We did not find any significant differences between surveyed employees in POEs and SOEs or between our initial sample and final sample in terms of demographics (i.e., comparing POE and SOE samples: $t = -1.52$, *ns* for age, $t = 1.61$, *ns* for education, $t = -1.25$, *ns* for tenure; comparing initial and final samples: $t = 1.91$, *ns* for age, $t = 1.76$, *ns* for education, $t = -1.67$, *ns* for tenure). We also obtained archival demographic data (age, education, and tenure) for all R&D employees in two POEs and three SOEs and did not detect any significant difference between all R&D employees in the POEs and their counterparts in the SOEs in terms of age ($t = -1.87$, *ns*), education ($t = 1.80$, *ns*), and tenure ($t = -1.90$, *ns*). We compared the demographics of all R&D employees from these five firms with their counterparts in our final sample and did not identify any significant difference ($t = -0.93$ to 1.92 , *ns* for age, $t = -1.02$ to 1.95 , *ns* for education, $t = -1.82$ to 1.89 , *ns* for tenure). The above results show that POEs and SOEs have similar R&D employees and that our sampled R&D employees are representative of all R&D employees in their firms.

Measures

The psychological measures (7-point Likert scale) used in this study were either developed in China or showed excellent psychometric properties when used in Chinese or Eastern settings. Gong, Law, et al. (2009) developed and validated the performance- and maintenance-oriented HR systems measures in China. Zhou and George's (2001) creativity measure has demonstrated desirable reliability and validity in prior studies conducted in China (e.g., Zhang & Bartol, 2010). The domain-relevant skills measure from Youndt, Subramaniam, and Snell (2004) has also shown excellent reliability and validity in an Eastern culture (Takeuchi, Lepak, Wang, & Takeuchi, 2007). Since the target respondents (well-educated R&D employees and their supervisors) had a good command of English, the questionnaire was written in

both English and Chinese to facilitate respondents' understanding of the measures. To generate the Chinese questionnaire, the English items were translated into Chinese by a management researcher and then translated back into English by another professor (Brislin, 1986). Then, three management professors who are bilingual in English and Chinese compared the English version to the original and concluded that they were highly comparable and made further modifications to the Chinese items to improve accuracy and readability.

Moreover, we conducted a pretest of the measures' content validity and generalizability by inviting five HR executives, five core knowledge employees, and five supervisors to inspect our survey. They provided comments on whether the items reflect their corresponding variables and whether the items were generalizable to their work settings. We made further refinements based on their feedback. For example, following their feedback, at the beginning of the survey, we added the phrase "please rate the items according to your experience in your current company."

Employee-experienced performance-oriented HR systems. Core knowledge employees reported their own experienced performance-oriented HR systems rather than an overall assessment of their firm's HR systems according to Gong, Law, et al.'s (2009) 36-item performance-oriented HR systems measure. A sample item was "I regularly receive development-focused performance appraisals in my firm." Cronbach's α was 0.91. $Rwg_{(j)} = 0.55$ was below the conventional aggregation cutoff of 0.70 (Bliese, 2000; James, Demaree, & Wolf, 1984), thereby supporting the standpoint of SHRM researchers that meaningful variability exists in employees' individual experiences of HR systems (Nishii et al., 2008; Wright & Nishii, 2013).

Employee-experienced maintenance-oriented HR systems. Core knowledge employees rated their own experienced maintenance-oriented HR systems rather than an overall assessment of their firm's HR systems in line with Gong, Law, et al.'s (2009) 12-item maintenance-oriented HR systems measure. A representative item was "my firm has offered me a pledge of employment security." Cronbach's α was 0.82. Likewise, $Rwg_{(j)} = 0.57$ was below the conventional aggregation cutoff of 0.70 (Bliese, 2000; James et al., 1984). Thus, this result shows that HR systems are experienced and interpreted differently by employees, and it is not appropriate to aggregate their experiences to the firm level (Nishii et al., 2008; Wright & Nishii, 2013).

Firm ownership. Firm ownership was coded as a dichotomous variable (0 = POE; 1 = SOE).

Employee domain-relevant skills. Youndt et al.'s (2004) five-item scale was used to measure core knowledge employees' skills in their job/specialty areas. Employees rated items such as "I am highly skilled in my job/specialty area." Cronbach's α was 0.80. We also checked the validity of the domain-relevant skills measure by collecting data on the technical levels (evaluated and awarded by the firms) of 87 surveyed engineers from 15 firms. Since these 15 firms have different level ranges for engineers (4 to 7 levels), we calculated the correlation between engineers' technical levels and their domain-relevant skills scores within each firm. The correlations across the 15 firms ranged from 0.79 to 0.97 with a mean of 0.87. This result provides evidence of the convergent validity of the psychological measure of domain-relevant skills as reflecting the knowledge and technical skills of an employee in his/her job area.

Employee creativity. Supervisors rated core knowledge employees' creativity using the 13-item scale from Zhou and George (2001). A sample item was "this employee suggests new ways to achieve goals or objectives." Cronbach's α was 0.90. In this study, we asked R&D employees' supervisors who were R&D department heads to rate their creativity. Within each firm, these key R&D personnel were under the same supervisor. As Zhou and Shalley's (2003) review points out, the use of a single supervisor rating of employee creativity has been widely used in the field research on creativity (e.g., Farmer, Tierney, & Kung-McIntyre, 2003; Hirst et al., 2009; Oldham & Cummings, 1996; Tierney, Farmer, & Graen, 1999; Zhou & George, 2001). In particular, Scott and Bruce (1994) used supervisor ratings to test their hypotheses and reported that supervisor ratings were significantly correlated with number of invention disclosures. Tierney et al. (1999) also showed that supervisor ratings were significantly correlated with invention disclosure forms and research reports and discovered similar patterns of results across the three measures. Hence, George and Zhou (2001: 517) concluded that "indeed many such studies have demonstrated convergence between supervisor ratings and objective measures of creativity." To check the reliability and validity of the single supervisor's rating, we collected 52 R&D workers' creativity ratings from both R&D department heads and deputy heads in 10 firms. The results indicated a high correlation ($r = 0.82$) between R&D department heads' and deputy heads' assessments, which provided

evidence of the reliability and validity of the single supervisor's rating.

Aggregate employee creativity. In line with an additive composition model (Chan, 1998), we operationalized aggregate employee creativity in a firm as the mean of the firm's core knowledge employees' creativity evaluations done by their supervisor (Gong, Kim, Lee, & Zhu, 2013; Zhou & George, 2001). Because aggregate employee creativity simply reflects the average rather than the shared level of core knowledge employees' creativity in a firm, empirical justifications such as Rwg do not apply (Chan, 1998; Marrone, Tesluk, & Carson, 2007).

Firm innovation. Following prior innovation studies (e.g., Hargadon & Sutton, 1997; Katila & Ahuja, 2002; Li, Maggitti, Smith, Tesluk, & Katila, 2013; Smith, Collins, & Clark, 2005; Tsai, 2001), we measured firm innovation as the number of new products introduced into the existing line of products of a firm in the year following our phase 3 data collection. Hagedoorn and Cloudt (2003) studied the innovative performance of a large international sample of nearly 1,200 companies using a variety of indicators such as R&D inputs, patent counts, patent citations, and new product announcements. Their conclusion is that "the statistical overlap between these indicators is that strong that future research may also consider using any of these indicators to measure the innovative performance of companies" (Hagedoorn & Cloudt, 2003: 1365). In addition, our discussions with surveyed companies' R&D managers indicated that it was appropriate to use this measure to capture the surveyed companies' innovation levels.

Control variables. At the firm level, we controlled for firm size (i.e., the logged value of the number of employees; Li et al., 2013) and prior firm innovation (the number of new products launched in the year prior to our phase 1 data collection). At the individual level, employee intrinsic motivation (Tierney et al., 1999), self-efficacy (Liao, Liu, & Loi, 2010), perceived empowering leadership (Zhang & Bartol, 2010), and perceived support for innovation climate (Anderson & West, 1998) were controlled.

Analysis

Hypotheses 1–3 were tested using hierarchical linear modeling (HLM) because these hypotheses include variables at different organizational levels. We applied the group-mean centering technique in order to avoid uncovering spurious cross-level

moderating effects (Hofmann & Gavin, 1998) when testing cross-level interaction Hypotheses 2 and 3. Hypothesis 4 predicts a single-level moderating effect at the firm level so we tested this hypothesis using ordinary least squares (OLS) regression.

RESULTS

Confirmatory Factor Analyses (CFA)

We conducted CFA to verify whether performance- and maintenance-oriented HR systems are distinct from each other (these two variables were measured at phase 1). Our theorized two-factor HR systems model with four randomly created item parcels under each factor was a better fit to the data ($\chi^2_{(19)} = 43.25$, RMSEA = 0.06, CFI = 0.95) than an alternative two-factor model formed by setting the correlation between the two types of HR systems equivalent to 1 ($\Delta\chi^2_{(1)} = 39.97$, $p < 0.01$, RMSEA = 0.09, CFI = 0.87). Therefore, the CFA results indicate that the two types of HR systems are distinct and that it is appropriate to consider them as two separate constructs for theorizing and hypothesis testing. The two-factor model of domain-relevant skills and intrinsic motivation (measured at phase 2) also fit the data ($\chi^2_{(34)} = 61.27$, RMSEA = 0.04, CFI = 0.93) better than a more parsimonious two-factor model formed by setting the correlation between the two factors equivalent to 1 ($\Delta\chi^2_{(1)} = 91.26$, $p < 0.01$, RMSEA = 0.10, CFI = 0.70). The CFA results thus reveal that domain-relevant skills and intrinsic motivation are distinct from each other and can be treated as two separate constructs for theorizing and hypothesis testing.

Hypotheses Testing

Supporting Hypothesis 1, the results of Model 2 in Table 3 indicate that the interaction between employee-experienced performance- and maintenance-oriented HR systems was significantly related to employee domain-relevant skills ($\gamma = 0.16$, $p < 0.05$). Figure 1 and slope tests show that the relationship between employee-experienced performance-oriented HR systems and domain-relevant skills was stronger when employee-experienced maintenance-oriented HR systems were high ($\gamma = 0.30$, $p < .01$) than low ($\gamma = -.02$, *ns*).

In support of Hypothesis 2, the coefficient for the three-way interaction among employee-experienced performance- and maintenance-oriented HR systems and firm ownership was significant, $\gamma = -0.10$,

$p < 0.05$ (Model 3 in Table 3 and Figure 2). The slope difference for the relationship between employee-experienced performance-oriented HR systems and domain-relevant skills when employee-experienced maintenance-oriented HR systems were high in POEs ($\gamma = 0.28, p < .01$) versus when employee-experienced maintenance-oriented HR systems were low in POEs ($\gamma = -0.02, ns$) was $\Delta\gamma = 0.30, t = 2.65, p < 0.01$. In comparison, the slope difference for the same relationship when employee-experienced maintenance-oriented HR systems were high in SOEs ($\gamma = 0.20, p < 0.01$) versus when employee-experienced maintenance-oriented HR systems were low in SOEs ($\gamma = 0.10, ns$) was significantly smaller: $\Delta\gamma = 0.10, t = 2.02, p < 0.05$. Thus, the findings support Hypothesis 2: i.e., employee-experienced maintenance-oriented HR systems more strongly augment the relationship between employee-experienced performance-oriented HR systems and domain-relevant skills in POEs than in SOEs.

Hypothesis 3 suggests a mediated moderation that arises when the interaction between an independent variable and moderators is significantly related to a mediator, which is significantly associated with an outcome variable (Muller, Judd, & Yzerbyt, 2005; Preacher, Rucker, & Hayes, 2007). We followed the suggestion of Preacher et al. (2007) and prior multilevel mediated moderation studies (e.g., Kirkman, Chen, Farh, Chen, & Lowe, 2009; Liu & Fu, 2011) to test this hypothesis based on the procedure recommended by Mathieu and Taylor (2007). Specifically, we tested whether the following four conditions for establishing a multilevel mediated moderation were satisfied: (a) the independent variable (i.e., the three-way interaction between performance- and maintenance-oriented HR systems and firm ownership) is significantly associated with the mediator (i.e., domain-relevant skills); (b) the independent variable is significantly related to the dependent variable (i.e., creativity); and when the mediator is controlled, (c) the mediator is significantly related to the dependent variable and (d) the relationship between the independent and dependent variables becomes no longer significant. Specifically, given that Hypothesis 2 was supported (i.e., the three-way interaction between performance- and maintenance-oriented HR systems and firm ownership was significantly related to domain-relevant skills), the first condition was satisfied. The three-way interaction was also significantly associated with creativity ($\gamma = -0.12, p < 0.05$; Model 6 in Table 3), thereby satisfying the second condition. In Model 7 of Table 3, the relationship

that the three-way interaction had with creativity was no longer significant ($\gamma = -0.09, ns$) when the mediator, domain-relevant skills, which was significantly related to creativity ($\gamma = 0.17, p < 0.01$), was added to the model. Hence, conditions 3 and 4 were also met. To cross-verify the finding, we also applied the Monte Carlo Bootstrapping approach (MacKinnon, Lockwood, & Williams, 2004) and bootstrapped 20,000 estimations of the indirect effect of the three-way interaction on creativity via domain-relevant skills. The confidence intervals of the indirect effect based on the bootstrapping estimations were significant (95% CI = $[-0.003, -0.04]$ excluding 0), therefore yielding additional support for Hypothesis 3.

Regarding Hypothesis 4, the interaction between aggregate employee creativity and firm ownership was significantly associated with firm innovation ($b = -1.56, p < 0.05$; Model 3 in Table 4). As demonstrated by Figure 3 and slope tests, aggregate employee creativity was more strongly related to firm innovation in POEs ($b = 1.32, p < 0.01$) than in SOEs ($b = -0.24, ns$). Thus, Hypothesis 4 received support.

DISCUSSION

We studied *whether, how, and when* an employee's experience of HR systems may influence his or her creativity, and *whether and when* aggregate employee creativity affects firm innovation. Our results based on multilevel, multiphase, and multisource field data revealed that employee-experienced performance-oriented HR systems interact with employee-experienced maintenance-oriented HR systems and firm ownership to facilitate employee creativity through employee domain-relevant skills. Employee-experienced maintenance-oriented HR systems are more likely to enhance the positive relationship between employee-experienced performance-oriented HR systems and domain-relevant skills in POEs than in SOEs. At the firm level, aggregate employee creativity was more strongly related to firm innovation in POEs than in SOEs. These findings generate theoretical and managerial insights into SHRM and creativity.

Theoretical Implications

Our inter-HR systems research expands on the systems perspective of SHRM. A central assertion of SHRM theory and research is that the coordination of multiple HR practices in a given type of HR system can reinforce and support each other to yield

TABLE 1
Individual-level Descriptive Statistics, Reliabilities and Intercorrelations among Measures^a

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Firm size (time 1, level 2)	1633.33	1903.32													
2 Firm ownership (time 1, level 2)	.53	.50	.25**												
3 Employee age (time 1; level 1)	34.95	7.59	-.06	.03											
4 Employee education (time 1; level 1)	3.84	1.12	.16**	-.04	-.01										
5 Employee tenure (time 1; level 1)	4.40	3.90	-.11*	.09	-.08	-.12*									
6 Empowering leadership (time 1; level 1)	4.45	0.80	.10	-.05	-.03	.05	-.02	(.81)							
7 Support for innovation climate (time 1; level 1)	3.49	0.70	-.01	-.02	-.04	.03	.02	-.02	(.78)						
8 Employee self-efficacy toward job (time 2; level 1)	3.42	0.64	.20**	-.06	-.01	.08	-.06	.08	.05	(.77)					
9 Employee-experienced performance-oriented HR systems (time 1; level 1)	4.92	0.93	.19**	-.07	-.09	.08	.02	.10	-.02	.06	(.91)				
10 Employee-experienced maintenance-oriented HR systems (time 1; level 1)	4.00	1.02	.12*	.03	-.10	.09	.04	.01	.04	-.04	.12*	(.82)			
11 Employee domain-relevant skills (time 2; level 1)	4.70	0.85	.24**	-.05	.06	.05	.09	.11*	.07	.13*	.23**	.09	(.80)		
12 Employee intrinsic motivation (time 2; level 1)	4.50	0.62	.12*	-.03	-.02	.09	.04	.14*	.02	.14*	.05	.32**	.12*	(.84)	
13 Employee creativity (time 3; level 1)	4.33	1.25	.12*	-.04	-.08	.12*	-.05	.13*	.10	.15*	.44**	.31**	.39**	.24**	(.90)

^a $n = 352$ at the employee level (level 1); $n = 57$ at the firm level (level 2). Reliabilities of the scales are boldfaced and noted in the diagonals. Data on variables 1 and 2 were collected from a surveyed firm's HR department at time 1. Data on variables 3–7 and 9–10 were collected from employees at time 1 and data on variables 8 and 11–12 were collected from employees at time 2 (1 month after time 1). Data on variable 13 were collected from the employees' direct supervisors at time 3 (1 month after time 2).

* $p < .05$

** $p < .01$ (two-tailed)

TABLE 2
Firm-level Descriptive Statistics and Intercorrelations among Measures^a

	Variables	<i>M</i>	<i>SD</i>	1	2	3	4
1	Firm size	1702.10	2229.85				
2	Prior firm innovation (the year prior to Time 1 data collection)	5.21	4.17	-.05			
3	Firm ownership	.54	.50	.27**	-.08		
4	Aggregate employee creativity (Time 3)	4.17	.97	-.10	.16*	-.05	
5	Firm innovation(the year after Time 3 data collection)	6.03	5.02	-.04	.36**	-.07	.36**

^a *n* = 50 at the firm level (level 2). Data on variables 1 and 3 were collected from a surveyed firm's HR department. Data on variables 2 and 5 were collected from a surveyed firm's R&D department. Data on variable 4 were collected from the surveyed employees' direct supervisors.

**p* < .05

***p* < .01 (two-tailed)

synergetic effects on organizations and employees (Huselid, 1995; Wright & Boswell, 2002). Accordingly, prior SHRM studies have investigated whether HR systems had stronger effects on organizational performance as compared to individual HR practices (Combs et al., 2006; Delery, 1998; Guerrero & Barraud-Didier, 2004). Jiang and colleagues' (2012) meta-analysis shows the distinct main effects of different bundles of HR practices on organizational outcomes. Extending the SHRM literature, our study takes a unique inter-HR systems approach by demonstrating that two different types of HR systems, performance- and maintenance-oriented, have a positive interactive effect on employee domain-relevant skills and that this positive interactive effect is stronger in POEs. As such, an interactionist perspective on multiple types of HR systems holds much promise for a better understanding of the complexity and potential of HR systems. That is, to gain deeper insights into SHRM, scholars should delve into which and when different types of HR systems may be coordinated to produce synergy.

This research extends SHRM research to the domain of creativity, which has been increasingly recognized as a critical means by which firm competitiveness is achieved (Liu et al., 2016). The SHRM literature has predominantly focused on firm-level variables as the outcomes of HR systems (Jiang et al., 2013). A key contention in SHRM studies is that HR systems enhance firm competitiveness (Wright & Boswell, 2002). We propose that, at the micro level, this contention hinges on the critical role that employee experiences of HR systems play in promoting employee domain-relevant skills and ultimately, creativity—the source of firm innovation that facilitates firm competitiveness. Our multilevel data also generate relevant empirical

evidence, thereby adding to the validity, utility, and scope of SHRM research.

Our study attests to the importance of firm ownership in the functioning of HR systems and advances knowledge of the appropriate alignment between HR systems and firm contexts. Recent reviews of SHRM research reveal that the moderating effects of firm ownership (e.g., SOEs versus POEs) on the associations between HR systems and individual outcomes are not yet documented (e.g., Jackson et al., 2014; Liang et al., 2012). Due to its unique institutional and economic conditions, China provides an appropriate research setting for investigating how HR systems may function differently across SOEs and POEs. In line with the contingency perspective of SHRM (Delery & Doty, 1996) and P-O fit theory (Kristof, 1996), this research advances a contingent model on HR systems and demonstrates that the synergetic interplay between employee-experienced performance- and maintenance-oriented HR systems is more likely to emerge in POEs than in SOEs. Thus, to more clearly understand the functioning of HR systems, scholars need to develop more refined models that take into account firm contextual characteristics such as ownership.

Another meaningful contribution of this research is to uncover employee domain-relevant skills as the pivotal mechanism underlying the three-way interactive effect of employee-experienced performance- and maintenance-oriented HR systems and firm ownership on employee creativity. Jiang and colleagues' (2013) review of mediation studies of HR systems concludes that, to add nuances to the SHRM research, scholars should look at multiple HR systems simultaneously and examine the mediating mechanisms underlying the relationships between HR systems and individual outcomes (Jiang et al., 2013). Whereas the

TABLE 3
HLM Results: The Joint Effects of HR Systems and Firm Ownership on Employee Domain-Relevant Skills and Creativity^a

	Variables	Domain-Relevant Skills (time 2)			Creativity (time 3)			
		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
1	<i>Intercept</i>	4.53** (.05)	4.48** (.07)	4.41** (.10)	4.25** (.05)	4.22** (.05)	4.18** (.06)	4.10** (.06)
2	<i>Control variables</i>							
	Firm size (level 2; time 1)	.13* (.06)	.11 (.06)	.07 (.05)	.07 (.04)	.05 (.03)	.08 (.05)	.05 (.04)
	Employee education (time 1)	.02 (.05)	.03 (.03)	.02 (.04)	.09* (.04)	.10* (.04)	.07 (.05)	.06 (.06)
	Empowering leadership (time 1)	.09 (.05)	.09 (.05)	.07 (.04)	.15* (.06)	.13 (.07)	.12 (.07)	.10 (.07)
	Employee self-efficacy toward job (time 2)	.11* (.05)	.12* (.05)	.08 (.04)	.07* (.03)	.08* (.03)	.06 (.03)	.05 (.04)
	Employee intrinsic motivation (time 2)	.15* (.06)	.13 (.07)	.09 (.07)	.13** (.04)	.12* (.05)	.13* (.06)	.14* (.06)
3	<i>Independent variables</i>							
	Performance-oriented HR systems (time 1)	.16* (.06)	.14* (.05)	.13* (.06)	.12* (.05)	.09* (.04)	.11 (.06)	.12 (.06)
	Maintenance-oriented HR systems (time 1)	.08 (.06)	.06 (.05)	.05 (.05)	.08 (.05)	.06 (.05)	.10 (.05)	.10 (.06)
	Firm ownership (level 2; time 1)	-.08 (.04)	-.06 (.04)	-.04 (.05)	-.06 (.04)	-.09 (.05)	-.06 (.05)	-.08 (.06)
	Performance-oriented HR systems × Maintenance-oriented HR systems (time 1)		.16* (.07)	.15* (.07)		.13* (.05)	.14* (.06)	.15 (.08)
	Performance-oriented HR systems × Firm ownership (time 1)			.02 (.05)			.03 (.07)	.11 (.08)
	Maintenance-oriented HR systems × Firm ownership (time 1)			-.04 (.04)			-.08 (.05)	-.04 (.05)
	Performance-oriented HR systems × Maintenance-oriented HR systems × Firm ownership (time 1)			-.10* (.04)			-.12* (.05)	-.09 (.05)
4	<i>Mediator</i>							
	Domain-relevant skills (time 2)							.17** (.05)
	R ^{2b}	.10	.19	.27	.20	.24	.30	.33

^a $n = 352$ at the employee level (level 1); $n = 57$ at the firm level (level 2). Variables are at level 1 unless otherwise noted. Standard errors are noted in parentheses where applicable. Logarithmic transformation of firm size was used. To facilitate comparisons of the magnitudes of effects stemming from differently scaled variables, we standardized all predictors except for firm ownership (0 = POEs, 1 = SOEs) before entering them into HLM. ^bR² is calculated based on proportional reduction of error variance due to predictors in the models (Snijders & Bosker, 1999). To prevent reduction in statistical power, employee age, tenure, and support for innovation climate were not included in the final data analysis because they were not significantly related to domain-relevant skills and creativity (Becker, 2005).

* $p < .05$

** $p < .01$ (two-tailed)

componential theory of creativity has posited that both domain-relevant skills and intrinsic motivation may function as mediators connecting contextual and individual factors to employee creativity, past creativity research has focused on intrinsic motivation (Liu et al., 2016). In order to address the question of how employees' experiences of different HR systems impact employee creativity, we develop theoretical arguments and provide empirical evidence for the

unique mediating role of employee domain-relevant skills above and beyond employee intrinsic motivation. The implication is that there is no single mediator (e.g., intrinsic motivation) that explains the impact of all antecedents of creativity. Focusing exclusively on intrinsic motivation may lead to the omission of additional antecedents and psychological mechanisms. By examining predictors of domain-relevant skills, scholars can identify crucial individual

TABLE 4
OLS Regression Results: The Joint Effect of Aggregate Employee Creativity and Firm Ownership on Firm Innovation^a

Variables		Firm Innovation		
		Model 1	Model 2	Model 3
1	Constant	6.03** (.68)	6.22** (.99)	6.51** (.96)
2	Control variables			
	Firm size	-.11 (.68)	.08 (.69)	.00 (.66)
	Prior firm innovation	1.80* (.68)	1.55* (.67)	1.38* (.65)
3	Independent variable			
	Aggregate employee creativity		1.56* (.67)	1.32* (.65)
4	Moderator variable			
	Firm ownership		-.34 (1.37)	-.87 (1.34)
5	Interaction variable			
	Aggregate employee creativity × Firm ownership			-1.56* (.72)
	F	3.51*	3.26*	3.76**
	R ²	.13	.23	.30

^a $n = 50$ at the firm level. To facilitate comparisons of the magnitudes of effects stemming from differently scaled variables, we standardized all predictors except for firm ownership (0 = POEs, 1 = SOEs) before OLS analysis.

* $p < .05$

** $p < .01$ (two-tailed)

and organizational variables that may promote or prevent creativity via this underlying mechanism.

This research also contributes to the conceptualization and test of the effects of multilevel factors on employee creativity. As pointed out by Anderson et al.'s (2014: 1315) recent review, "only a handful of studies have examined creativity and innovation

processes from the multi-level perspective." Given that individuals are embedded in organizations, understanding employee behavior requires the integration of the macro and micro literatures (Mathieu & Chen, 2011). Prior multilevel creativity studies mainly examined the contextual effects of teams, supervisors, or coworkers on employee creativity

FIGURE 1
The Joint Influence of Employee-experienced Performance- and Maintenance-oriented HR Systems on Employee Domain-relevant Skills

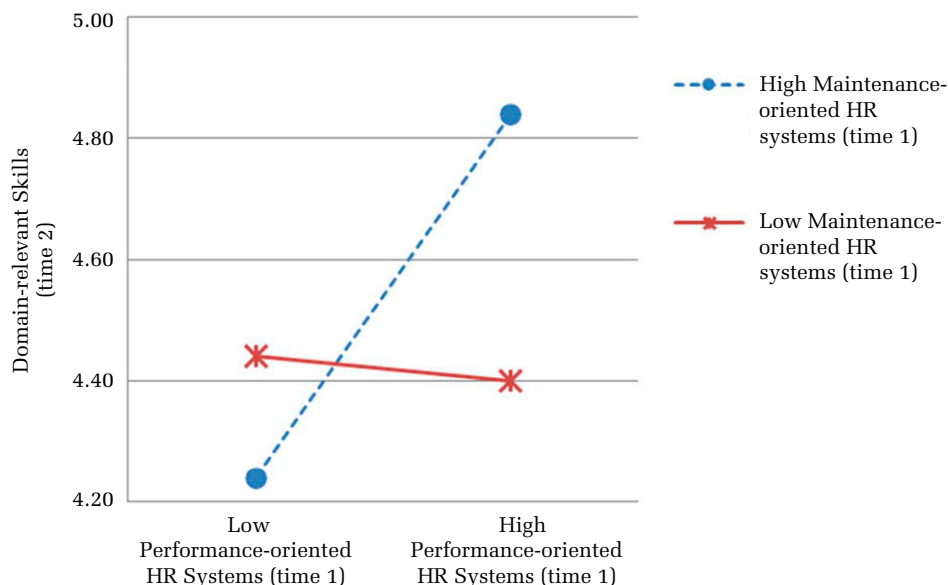
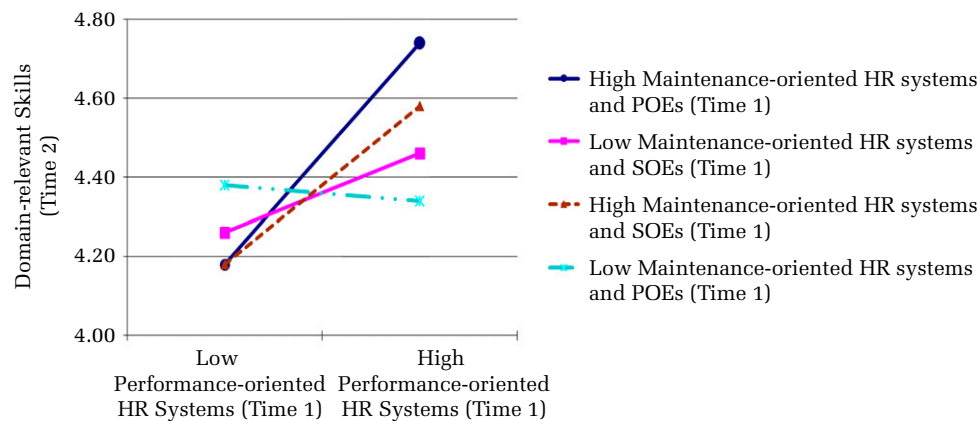


FIGURE 2
The Joint Influence of Employee-experienced Performance- and Maintenance-oriented HR Systems and Firm Ownership on Employee Domain-relevant Skills

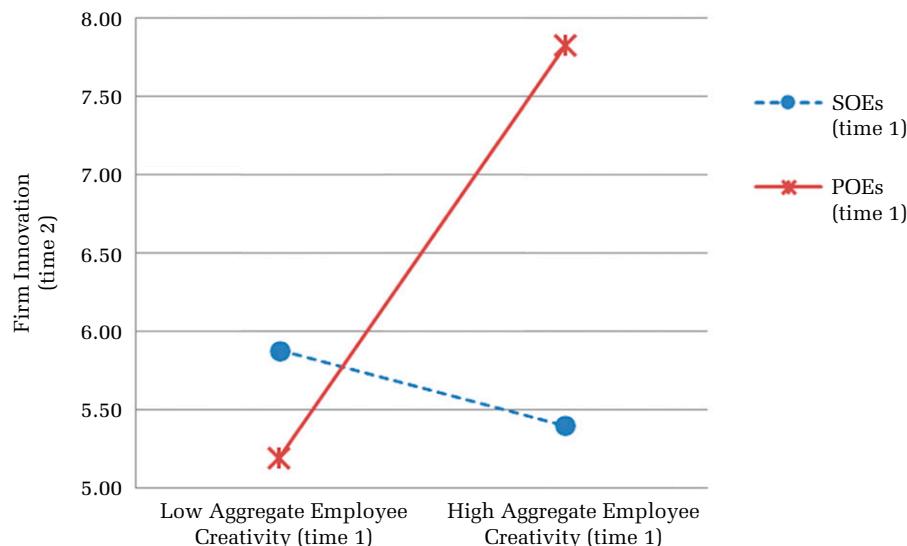


(e.g., Huang, Krasikova, & Liu, 2016; Liu, Chen, & Yao, 2011). Perhaps due to the daunting difficulties associated with conducting between-organization field studies, scholars have rarely investigated which, when, and how HR systems may affect individual creativity. Our study directly addressed these research questions by disentangling the cross-level relationships among employee-experienced performance- and maintenance-oriented HR systems (firms' primary and formal institutions in charge of managing human resources), firm ownership, employee domain-relevant skills, and creativity. Including institutional factors,

such as HR systems and firm ownership, in creativity studies, not only contributes to theoretical development in creativity research but also conveys practical implications to executives (Johns, 2006).

This research also answers the continuous call for integrating macro and micro perspectives and developing multilevel theories of SHRM (Nyberg & Wright, 2015; Wright & Nishii, 2013). Specifically, following Wright and Nishii's (2013) suggestion, we attempted to link individual outcomes of HR systems (employee creativity) back to other organizational outcomes (firm innovation) by revealing a positive

FIGURE 3
The Interactive Effect of Aggregate Employee Creativity and Firm Ownership on Firm Innovation



influence of aggregate employee creativity on firm innovation. The importance of employee creativity in fostering firm innovation has been emphasized by numerous scholars (e.g., Anderson et al., 2014; Kanter, 1988; Zhou & Shalley, 2008). Surprisingly, no study has actually tested this long-discussed hypothesis and its boundary conditions. Not only did the present investigation use field data, including objective firm innovation data, to provide much needed evidence of the employee creativity–firm innovation relationship, but our study also highlighted the types of firms in which this relationship is stronger or weaker. Therefore, our research suggests that scholars should not assume that the bottom-up influence of employee creativity on firm innovation is equally positive across firms. Depending on firm characteristics, such as ownership, employee creativity may have a varied relationship with firm innovation. It is likely that when firms rely mainly on external creativity (e.g., following other firms' inventions or receiving support from the government), the influence of their internal employees' creativity on firm innovation will be weaker.

Implications for Practice

Our findings have valuable implications for managers. Our research shows that HR systems do matter in facilitating employee creativity. With limited resources to expend, firms should maximize the return on their investments in HR systems by taking advantage of appropriate HR systems according to employee needs. This research provides clear guidance on which HR systems should be utilized to promote employee domain-relevant skills and, in turn, creativity by demonstrating that synergies occur when performance- and maintenance-oriented HR systems are implemented simultaneously. Accordingly, in order to enhance employee domain-relevant skills and creativity, organizations can adopt the HR practices prescribed by performance-oriented (e.g., career planning programs), and maintenance-oriented (e.g., employment security policies) HR systems. The implementation of HR systems should also consider firm ownership; our study demonstrated that the moderating effect of maintenance-oriented HR systems on the relationship between performance-oriented HR systems and domain-relevant skills was stronger in POEs. Given our finding of the mediating role of employee domain-relevant skills, managers can assess the degree to which the two types of HR systems are functional by gauging changes in employee domain-relevant skills.

The 2014 World Investment Report reveals that in 2014, China became the largest foreign direct investment recipient in the world and is at the top of the 2014–16 list of the economies most attractive to multinational firms. KPMG's 2014 global Tech Innovation Survey of 768 technology industry leaders from the top 14 countries propelling technology innovation found that China was named as the country second most likely to be a future innovation hub (24% of respondents) following the U.S. (30%). This begs the question: how can multinational and domestic firms effectively boost organizational innovation in China? When entering China's market, foreign investors can choose to collaborate with SOEs and/or POEs. Many multinational firms choose SOEs (rather than POEs) as collaborating partners because of SOEs' government connections and easy access to resources. This research spotlights the critical role of performance- and maintenance-oriented HR systems in employee creativity, which in turn drives firm innovation in both SOEs and POEs. Yet, the findings also reveal that employee creativity does not translate into firm innovation as effectively in SOEs as in POEs. Accordingly, despite SOEs' access to unique external support and resources, SOE leaders and investors should encourage managers to pay increased attention to their internal human resources and create more opportunities for turning internal employees' creative ideas into firm innovation. This practical implication has a broad application to other countries, such as those in the former Eastern bloc, which have a salient presence of SOEs in addition to POEs.

Limitations and Future Research Directions

This research has several limitations, which suggest meaningful future research directions. First, this research did not consider possible individual-level factors that may strengthen or weaken the functioning of HR systems. Trait activation theory has indicated that external factors interact with individual difference variables to affect individual outcomes (Tett & Burnett, 2003). In China, communist party membership may be a meaningful individual factor that may interplay with HR systems to influence employees. The Party has more than eighty-six million members who hold leadership positions in a majority of political and economic sectors in China. Hence, party membership may give access to contacts, resources, and preferential treatments that can substantially advance one's career (Li & Walder, 2001). From a P-O fit perspective, compared to non-party employees, party members under the patronage of the Party may

perceive less need for HR systems, which should thus be less influential to party members' domain-relevant skills and creativity. Moreover, an employee's performance level may moderate the relationship between performance-oriented HR systems and domain-relevant skills. Our theorizing emphasizes that performance-oriented HR systems provide the means for employees to achieve their needs for growth and development. It is possible that high performers respond more positively to performance-oriented HR systems. Poor performers who fail to meet the expectations of performance-oriented HR systems may respond less positively to such HR systems and even leave the company (cf. Batt & Colvin, 2011; Shaw, Dineen, Fang, & Vellella, 2009).

It is also possible that employees from POEs and SOEs may have different levels of need strength. As reported earlier, however, we did not find any significant demographic differences between our initial sample and final sample, as well as between respondents in POEs and SOEs. It should also be noted that we surveyed the same type of employees in both POEs and SOEs, core knowledge employees (i.e., R&D employees who are critical to knowledge creation and development of firm innovation), who should thus have comparable needs: both the needs for skill development and career advancement and the needs for job security and protection of equal status and rights. We have also controlled for employee education, job self-efficacy, intrinsic motivation, firm ownership, and firm size in our analyses. It is, however, still worth directly testing whether employee need strength may alter the effects of HR systems on employee outcomes in future studies.

Second, our surveyed firms were from a convenient sample in order to ensure a higher response rate (Takeuchi, Chen, & Lepak, 2009). We studied metallurgical firms in a Northeastern province of mainland China and were unable to collect data from firms in other industries and provinces. Future research that investigates firm-level variables may take a stratified sampling approach (Lohr, 2010) to first partition the firm population into disjointed subgroups according to industries, regions, and other criteria that may significantly differentiate firms and then randomly sample firms from each subgroup. In addition, we followed prior research to instruct the senior HR executives to randomly select a list of 15 core knowledge employees (e.g., Collins & Smith, 2006). While we did not have control over their sampling procedure, as reported above, we did not detect any significant demographic differences between all R&D employees from five randomly

selected firms and their counterparts in our final sample. In addition, as suggested by research on P-O fit and SHRM, need fulfillment is important to many different groups of employees, both R&D and non-R&D (Kristof-Brown et al., 2005; Wright & Boswell, 2002; Wright, Coff, & Moliterno, 2014). The needs for skill development, career development, job security, and equal rights should also be valued by all employees in organizations (Alderfer, 1969; Deci & Ryan, 2000). The componential theory of creativity has also underscored domain-relevant skills as a fundamental mechanism underlying an employee's creativity across different job positions (Amabile, 1988, 1996). Hence, the findings of this research should be somewhat applicable to non-R&D employees; although the extent to which our results hold for non-R&D employees, who should be less oriented toward creativity and innovation, is an empirical question. Although we have controlled for employee education, job self-efficacy, and intrinsic motivation in the data analysis to help rule out the sampling bias, future studies should find ways to conduct randomized sampling of different types of employees, and directly test the influence of sample characteristics on the hypothesized relationships (e.g., R&D versus non-R&D employees) (Lohr, 2010).

Third, the mediators that translate performance- and maintenance-oriented HR systems into domain-relevant skills warrant future investigation. Building on P-O fit theory (Chatman, 1991; Kristof, 1996; Schneider et al., 1997) and the dual-concern model of HR systems (Gong, Law, et al., 2009), we have gone into detail about why performance- and maintenance-oriented HR systems may satisfy different employee needs. Yet, because of the complexity of our multilevel model and hypotheses, we did not examine whether need satisfaction may mediate the link between HR systems and domain-relevant skills. To further extend our work, scholars may develop measures of satisfaction of different needs and test their mediation effects. It is also a valuable extension to study whether performance- and maintenance-oriented HR systems may interact to affect a number of employee outcomes including productivity and morale via domain-relevant skills and other mediators such as intrinsic motivation.

Fourth, although it is not the focus of this research, it is valuable to explore the antecedents of employees' experiences of performance- and maintenance-oriented HR systems. While it is intuitive to posit firm ownership as a cause, theoretical and empirical evidence suggests otherwise. Both SOEs and POEs have implemented performance- and maintenance-oriented HR practices

due to market competition and legal requirements (Liang et al., 2012). Wei and Lau (2005) demonstrated that firm ownership was not significantly related to a firm's adoption of SHRM systems in China, whereas firm market orientation, HRM importance (as perceived by top management), and HRM competency were. They also showed that firm ownership did not interact with firm market orientation, HRM importance, or HRM competency to predict a firm's adoption of SHRM systems. In a later study, Wei and Lau (2008) similarly found no significant relationship between ownership and SHRM systems. Our data also indicated that ownership and HR systems were not significantly correlated ($r = -0.07$, ns for the correlation between firm ownership and performance-oriented HR systems; $r = 0.03$, ns for the correlation between firm ownership and maintenance-oriented HR systems in Table 1). We also collected an independent sample of 36 SOE and 46 POE HR professionals attending a part-time HR master's degree program in a Northeastern Chinese University to double check the relationship and found that the correlations that firm ownership has with performance- ($r = 0.02$, ns) and maintenance-oriented ($r = 0.05$, ns) HR systems were not significant. Building on event system theory (Morgeson, Mitchell, & Liu, 2015), future studies can take an integrative theory building approach to investigate how firm-level (e.g., strategic foci) and industry-level attributes (e.g., labor versus capital intensive industries) may interact with different types of events (e.g., mergers and acquisitions; CEO turnover) to affect objective indices of HR systems (e.g., investment in employee training) and ultimately, employees' individual experiences of HR systems.

Fifth, despite the parsimony promised by our focus on the primary types of HR systems, we acknowledge that seemingly consistent HR practices may not always have consistent effects across different settings. Thus, it is interesting to explore in what situations (e.g., characteristics and preferences of employees and firms) seemingly consistent HR practices within a given type of HR system may exert distinct influences on the same outcome. Moreover, some studies conducted in the West have separated individual commission pay and employee monitoring from other performance-oriented HR practices (e.g., selective hiring and extensive training) and labeled them expectation-enhancing HR practices (e.g., Shaw et al., 2009). However, studies conducted in China have consistently placed such practices together with selective hiring, extensive training, etc. into high performance work systems or

performance-oriented HR systems (e.g., Chang, Jia, Takeuchi, & Cai, 2014; Sun, Aryee, & Law, 2007; Xiao & Tsui, 2007). Similar to prior research conducted in China (e.g., Sun et al., 2007; Xiao & Tsui, 2007), we did not include employee benefits (e.g., medical, pension etc.) in the HR systems measures because under the Chinese social security system, both SOEs and POEs must contribute to designated pension and insurance funds (e.g., medical, unemployment, maternity, and work-related injury insurances) (Ligornier, Feng, & Mosvick, 2012). The items of the HR systems measures adopted in this study are the most common ones that Gong, Law, et al. (2009) identified based on an extensive literature review. Yet, including employee benefits may gauge HR systems more thoroughly and thus make the test of our hypotheses less conservative. Researchers can conduct cross-cultural studies to unpack whether and how the different compositions of HR systems may cause distinct outcomes in Eastern vs. Western samples.

Sixth, we encourage future research to examine which HR practices should comprise creativity-targeted HR systems in companies (e.g., high-techs) that uphold a strategic objective emphasizing creativity and innovation (Lepak, Liao, Chung, & Harden, 2006). A related question concerns when firms should design and implement such HR systems (e.g., in the situation of explicitly pursuing an innovation-based competitive strategy). With these questions resolved, it will be intriguing to investigate whether creativity-targeted HR systems predict employee creativity above and beyond relatively general HR systems (i.e., performance- and maintenance-oriented). Theoretical and practical insights can also be obtained from exploring the mechanisms (e.g., employee creative competence) for the relationship between creativity-targeted HR systems and employee creativity.

Finally, more refined measures of employee creativity and firm innovation should be applied in future studies. We asked supervisors to rate employee creativity and assessed firm innovation as the number of new products in accordance with prior creativity and innovation research (e.g., George & Zhou, 2001; Hargadon & Sutton, 1997; Katila & Ahuja, 2002; Li et al., 2013; Smith et al., 2005; Tsai, 2001). The surveyed companies' R&D managers also endorsed our measures of employee creativity and firm innovation. Nevertheless, it is more informative to use multiple indices to tap into the different aspects of employee creativity (e.g., supervisor ratings of creative idea quality and objective measures such as the number of creative ideas proposed) and firm

innovation (e.g., numbers of new products, patents, and processes) if they are available and appropriate for the employees under study.

CONCLUSIONS

Past SHRM studies generally took an *intra-HR systems* approach and showed that internally aligned HR practices within one type of HR system may have a stronger influence than individual HR practices. Our *inter-HR systems* research adds to the SHRM literature by providing one of the rare empirical examples of how synergy may emerge from different types of HR systems. It also increases our understanding of when and how employee-experienced HR systems impact employee creativity by explicating the moderating role of firm ownership and the mediating role of employee domain-relevant skills. At the firm level, we not only provided the first evidence of a significant relationship between aggregate employee creativity and firm innovation but also showed that the relationship strength varies between SOEs versus POEs. We hope this study can foster more multilevel research on the joint roles of HR systems and firm ownership in stimulating or stifling employee outcomes.

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