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경영학 석사 학위논문

**Should HR be Competitive or Cooperative to  
Elicit Creativity? The Effects of HR Systems on  
the Employee's Distinct Types of Creativity  
through Knowledge Management Behaviors**

인사관리 시스템이 지식관리 행위를 통해  
직원들의 서로 다른 종류의 창의성에 미치는 영향

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이재우

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## **ABSTRACT**

# **Should HR be Competitive or Cooperative to Elicit Creativity? The Effects of HR Systems on the Employee's Distinct Types of Creativity through Knowledge Management Behaviors**

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Extant SHRM literature has emphasized the role of cooperative aspects of HR systems on performance. However, there has been little attention to competitive aspects of HR systems in such a context. From this standpoint, I identify how employees' perceptions of competitive and cooperative HR systems facilitate radical and incremental creativity via knowledge expansion and sharing based on the insights from social comparison, social interdependence, and social exchange theory. Further, drawing on previous research on creativity and information processing, I examine whether the

effects of knowledge management behaviors on distinct types of creativity vary depending on employees' intuitive and systematic work style. Analyses of data collected from 182 employees and 65 team leaders in 27 companies revealed that employees' perceptions of competitive and cooperative HR systems are positively related to knowledge expansion and sharing, respectively. Knowledge expansion was positively related to radical creativity and mediated the relationship between competitive HR systems and radical creativity. Although not significantly related to incremental creativity, knowledge sharing significantly facilitated incremental creativity when employees exhibited a higher level of intuitive work style. I provide substantial theoretical and practical insights by offering comprehensive understandings of how employees' perceptions of different HR systems affect distinct types of creativity.

**Keywords:** SHRM, competitive and cooperative HR system, radical and incremental creativity, knowledge expansion and sharing, work-specific cognitive styles

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## I. INTRODUCTION

Over the last three decades, the strategic human resource management (SHRM) literature has investigated the effect of HR systems on various outcomes, such as employees' knowledge, skills, and abilities (KSAs), attitudes and behaviors (e.g., greater satisfaction and affective commitment), and subsequently, firms' operational and financial performance. In particular, most studies in SHRM have focused on the link among HRM practices, intermediating HR outcomes, and subsequent firms' performance (Posthumus, Campion, Masimova, & Campion, 2013). However, with a few exceptions, there is limited research on the relationship between HR practices and employee creativity (Liu, Gong, Zhou, & Huang, 2017). The present study argues that this is an oversight for several reasons. First, innovation has become an indispensable factor for an organization to survive in today's business environment (Anderson, Potočnik, & Zhou, 2014). Scholars have assumed that individual creativity is the foundation of innovation (e.g., Kanter, 1988; Lopez-Cabrales, Pérez-Luño, & Cabrera, 2009). Thus, employee creativity should be regarded as an important intermediate outcome for a firm. Second, scholars in SHRM have established the role of SHRM as a contextual influence on individual employees' attitudinal and behavioral outcomes through constant communication of messages to the employees (e.g., Bowen & Ostroff, 2004; Liao, Toya, Lepak, & Hong, 2009). Given the results of prior studies that creativity is subject to diverse contextual influences (Chang, Jia, Takeuchi, & Cai, 2014), SHRM is likely to influence employee creativity as a

contextual cue. However, despite such a possibility, considerably less research focuses on how HR systems promote individual creativity. As a result, investigating how HR systems affect employees' creativity is a pressing issue. To address this issue, the present study develops hypotheses about how HR systems affect employees' creativity. Prior studies revealed that macro-level HR systems and employees' experiences of HR systems facilitate employees' creativity but lacked detail on the individual-level mechanism of why and how HR systems can affect their creativity. By examining the mechanism through which the employees' perception of HR systems induce creativity and what individual-level factors affect the mechanism, this study supplements the limitation of prior studies and contributes to the literature on SHRM and creativity.

Furthermore, the present study extends prior literature on the relationship between SHRM and creativity by dividing the integrative concept of creativity into radical and incremental creativity. Prior research on innovation separates the factors for radical innovation from incremental innovation (Dewar & Dutton, 1986). Considering that creativity is viewed as the first step for innovation and that there are the different types of creativity (Oldham & Cummings, 1996), recent creativity research recognizes the multifaceted nature of creativity and distinguish distinct types of creativity such as radical and incremental creativity (Madjar, Greenberg, & Chen, 2011). Moreover, as organizational ambidexterity, the firm's ability to exploit its present knowledge and search, experiment and discover novel things simultaneously (Duncan, 1976; Tushman & O'Reilly

III, 1996), has been regarded as an essential ability to meet conflicting demands of business environments (Gibson & Birkinshaw, 2004; He & Wong, 2004), there are more calls for examining the antecedents of distinct types of creativity. By revealing the antecedents of distinct types of creativity, the present study responds to such calls.

Moreover, examining several types of HR systems such as high-performance work systems (HPWS), high-commitment work systems, and high-involvement work systems, scholars in SHRM have emphasized the role of cooperation in HR systems for superior performance (e.g., Collins & Smith, 2006; Kehoe & Collins, 2017). However, there has been little attention to the HR practices used to promote internal competition or a competitive climate in the workplace. As the opposite of cooperation, competition has been used in numerous companies to generate a healthy comparison between employees that leads to a higher level of achievement and to attract employees with superior talent from external labor markets (Sapegina & Weibel, 2017). Studies that examine the effect of competitive HR practices on an individual or firm performance have focused on a single HR policy, such as compensation (e.g., Bloom, 1999; Shaw, Gupta, & Delery, 2002) or performance appraisal (e.g., Moon, Scullen, & Latham, 2016). However, despite the recent growth in SHRM studies, scholars in SHRM have largely ignored competitive HR practices in the conceptualization of HR systems and the effect of these systems on individual and firm outcomes (Sapegina & Weibel, 2017). The results of studies that do examine the effect of competitive aspects in a single HR

practice on individual and firm outcomes are, at best, mixed (e.g., Henderson & Fredrickson, 2001; Yanadori & Cui, 2013). Moreover, unlike prior results of meta-analyses which suggest that groups in cooperative conditions outperformed those in competitive situations (Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; Stanne, Johnson, & Johnson, 1999), a few recent studies reveal the constructive effects of competition in more realistic situations (e.g., Fletcher, Major, & Davis, 2008; Kistruck, Lount Jr, Smith, Bergman Jr, & Moss, 2016). The conflicting results of prior studies and the recent debate on the efficacy of competitive HR practices such as forced ranking systems (Sapegina & Weibel, 2017) warrant more research into the effects of competitive HR practices and systems.

In this process, the present study examines the role of two distinct knowledge management behaviors (KMBs) as mediators linking each HR system and creativity. As knowledge has been regarded to be a critical component for creativity (Amabile, 1996; Anderson et al., 2014), KMBs have been consistently identified as meaningful antecedents of creativity (e.g., Jiang & Chen, 2018; Rhee & Choi, 2017; Sung & Choi, 2018). Therefore, it is appropriate to consider KMBs as mediators of the relationship between HR systems and creativity. By defining two different KMBs – knowledge expansion and sharing, the present study reveals a precise mechanism through which KMBs stimulate distinct types of creativity at the individual level.

Finally, the present study defines employees' work-specific cognitive style as a boundary condition for the effect of employees' KMBs

on the distinct types of creativity. Cognitive styles are individual differences in perceiving and processing information experiences, affecting the way people think and act (Sagiv, Arieli, Goldenberg, & Goldschnidt, 2010; Sung & Choi, 2012). In the process of generating creative thinking, people should manipulate their knowledge by combining and reorganizing them, relying on their cognitive process (Baughman & Mumford, 1995; Sung & Choi, 2012). Therefore, it is ecologically valid to examine the impact of employees' cognitive styles on the mechanism through which their knowledge behavior eventually leads to the exertion of the distinct types of creativity. Specifically, the present study considers the intuitive and systematic work style as moderators that affect the relationship between KMBs and two types of creativity. Further, by examining the effect of an individual work-specific cognitive style on the path between KMBs and creativity, the present study responds to repeated calls for more research on the effect of cognitive states on creativity (Anderson et al., 2014).

In sum, drawing on social comparison, social interdependence, and social exchange theory, we investigate the effect of employees' perceptions of competitive and cooperative HR systems on radical and incremental creativity via knowledge expansion and sharing. The present study also examines the moderating roles of intuitive and systematic work style on the relationship between KMBs and creativity and the indirect effect of HR systems on creativity via KMBs.

## **II. THEORETICAL FRAMEWORK AND HYPOTHESES**

## **Employee Perception of HR Systems and KMBs**

Since research on the impact of SHRM on individual and firm performance started to prosper, the trend in research has moved from a focus on individual HR practices to a set of HR practices, or HR systems (Katou, Budhwar, & Patel, 2014). One fundamental principle that exists in SHRM research is that the effect of HR practices is best understood by examining the bundle, configuration, or system of HR practices (Lepak, Liao, Chung, & Harden, 2006). Lepak et al. (2006: 218) argued that “Considering that HR practices are rarely, if ever, used in isolation, failure to consider all of the HR practices that are in use neglects the potential important explanatory value of unmeasured HR practices.” Based on this principle, extensive empirical studies demonstrate that it is the bundles of HR practices rather than single HR practices that positively affect individual and firm-level performance (e.g., Combs, Liu, Hall, & Ketchen, 2006; Jiang, Lepak, Hu, & Baer, 2012a; Kehoe & Wright, 2013). Thus, following this principle, the present study examines the effect of HR systems on creativity.

Although there has been substantial progress in the macro-level research on SHRM, a group of scholars have argued that the literature lacks studies which consider employees’ experience of HR practices (Boon, Den Hartog, Boselie, & Paauwe, 2011; Jiang et al., 2017) and that more attention should be paid to the effect of HR systems experienced by employees. Indeed, employee groups can perceive HR practices differently in that HR policies can be tailored to each employee group depending on the distinctive characteristic of each employee group (Lepak & Snell, 2002) and that even

members of the same group may not have identical perceptions and experiences under the same HR practices (Den Hartog, Boon, Verburg, & Croon, 2013; Liao et al., 2009; Nishii, Lepak, & Schneider, 2008). Thus, even the same HR system can lead to varying reactions or outcomes of employees (Katou et al., 2014; Sanders & Yang, 2016). Further, recent studies have shown that employees' perceptions and experiences of HR practices have a closer relationship with individual outcomes than managers' perceptions (e.g., Aryee, Walumbwa, Seidu, & Otaye, 2012; Kehoe & Wright, 2013; Liao et al., 2009). Given that HR systems lead to enhanced firm performance through individual employees' attitudinal and behavioral outcomes (Posthuma et al., 2013), the underlying mechanism in which HR systems are perceived subjectively by employees and affect individual performance through such perceptions should be investigated to more rigorously understand the relationship between HR systems and firm performance (Kehoe & Wright, 2013; Piening, Baluch, & Salge, 2013). Thus, the present study focuses on the role of employee perceptions of HR systems as determinants of individual creativity.

Prior SHRM studies have mainly dealt with three discernable concepts of HR systems – high-commitment work systems, high-involvement HR systems, and high-performance work systems (HPWS) (Lepak et al., 2006; Sapegina & Weibel, 2017). Although such conceptualizations of HR systems that are prevalent in the SHRM literature are distinctive in their respective characteristics, they are related to one another in that they contain cooperative or collaborative aspects when they

emphasize common organizational goals. However, such HR systems are still insufficient to represent HR systems used in firms in the real world in that the concept of internal competition and competitiveness induced by HR practices are largely omitted in the HR systems previously discussed. A significant number of companies seem to rely on HR practices based on a “market logic,” where internal competition among employees is used to inspire employees and enhance their performance (Sapegina & Weibel, 2017). Given the prevalence of using HR practices that induce internal competition in the business world, a more thorough investigation of the effect of competition-inducing practices on performance is imperative. Thus, the present study defines two distinct HR systems – competitive and cooperative HR systems – and investigates the effect of each HR system on employees’ radical and incremental creativity.

In the process of investigating how HR systems perceived by employees to be competitive or cooperative influence their radical and incremental creativity, the present study posits that employee-perceived HR systems prompt distinct types of creativity by inducing their distinctive KMBs. Liao et al. (2009) demonstrated that perceived HR practices affect the distal performance of employees by influencing employees’ proximal behavioral responses. Moreover, in several prior studies on creativity, KMBs have been regarded as one of the critical antecedents of individual creativity (Rhee & Choi, 2017). These results support the direction of the hypotheses set forth in the model. Specifically, the present study posits that employees’ perceptions of competitive HR systems elicit radical creativity

by facilitating their knowledge expansion behavior, whereas their perceptions of cooperative HR systems elicit incremental creativity by promoting their knowledge sharing behavior. Among several KMBs proposed in diverse streams of literature (e.g., knowledge sharing, hiding, and manipulation), researchers have mainly focused on knowledge acquisition and sharing (e.g., Chuang, Jackson, & Jiang, 2016; Jiang & Chen, 2018; Sung & Choi, 2018). The present study adopts the concept of two distinct subcategories. However, the present study uses the concept of "knowledge expansion" instead of knowledge acquisition as a contrast to "knowledge sharing" to emphasize the difference between knowledge internal and external to an organization. Given prior definitions of knowledge acquisition, the concept of knowledge acquisition partially overlaps with that of knowledge sharing at the individual level because it includes the action of acquiring knowledge through internal knowledge sharing (e.g., Chen & Huang, 2009; Jackson, Chuang, Harden, & Jiang (2006); Jiang & Chen, 2018; Soda, Stea, & Pedersen, 2019), causing the overlap of knowledge in the same group. Thus, to make the concept of knowledge expansion distinct from that of knowledge sharing, the present study defines knowledge expansion as acquiring nonredundant knowledge from outside one's group or organization, which implies that internal competitors in his or her group do not have such knowledge.

***Competitive HR system and knowledge expansion*** The concepts of competitive HR systems rely on social comparison and social interdependence theory, which argues that the pattern of goal interrelations

determines whether interactions among individuals are competitive or cooperative (Deutsch, 1949). For competition, goals among employees are correlated negatively, as in the unequal allocation of rewards incurred as a result of interpersonal comparison of individual performance (Deutsch, 1949). In such a situation, one employee can achieve the desired outcome only when others are inferior to him or her. Drawing on social comparison and interdependence theory, and the concept of competition reflecting the situational aspect, Sapegina and Weibel (2017: 715) define competitive HR practices as “formal procedures that are designed to establish negative interdependence among employees and that rely on a relative comparison between employees.” Adopting and extending the above concept of competitive HR practices to competitive HR systems, which is bundles of competitive HR practices, the present study expects that employees’ perceptions of competitive HR systems will induce knowledge expansion since the increased motivation for superior performance induced by positive emotions and reliance on external networks encourage them to collect new knowledge outside of their organization or field of work.

First, as employees perceive their HR systems to be competitive, they rely more on knowledge expansion due to the motivation to surpass competitors. According to the social comparison perspective, when employees perceive their HR systems to be competitive, upward social comparison occurs because their performances are evaluated in relation to those of others and outperforming current better-off peers is their most pressing issue (Sapegina & Weibel, 2017). This comparison among

employees produces “a mixture of feelings,” including negative feelings such as envy, shame, and resentment, and positive feelings like inspiration, admiration, and optimism of individual employees (Smith, 2000). Among these emotions that are the outcomes of upward comparison, positive emotions, such as benign envy and inspiration, instill the motivation for superior performance in employees (Sapegina & Weibel, 2017). Moreover, attractive prizes, bonuses, and promotions for winners in competitive HR systems also elicit employees’ motivation for self-promotion and better performance to surpass other peers (Main, O'Reilly III, & Wade, 1993). Therefore, such motivation drives them to achieve performance superior to that of peers. Since their goal is to surpass others, simply improving individual performance through observing and mimicking better-off peers is not enough to achieve their goal (Swab & Johnson, 2019). Instead, they will try to gain a competitive advantage over competitors to show off their superiority with their creative ideas by acquiring new knowledge that their competitors do not have. As knowledge is a resource that can be the basis of an organization’s competitive advantage (Argote & Ingram, 2000), knowledge also can be a source of an individual’s competitive advantage. Especially, non-redundant knowledge acquired through knowledge expansion can be the basis of individual competitive advantage. As external knowledge, which does not overlap with existing internal knowledge, is absorbed by individual employees, it is integrated with their internal knowledge. Such knowledge integration and creation build new knowledge that is unique, inimitable, and valuable, being the basis of competitive

advantage (Grant, 1996; Matusik & Hill, 1998). Moreover, just imitating other employees' internal knowledge cannot be a source of competitive advantage because it is no more unique or proprietary (Matusik & Hill, 1998). Thus, the tendency to stick to nonredundant external knowledge can be intensified by the employees' motivation to achieve better performance and stand out among their peers.

Second, perceived competitive HR systems bring a sorting effect to the organization, attracting outside workers with superior quality, and sorting out unproductive employees (Lazear, 2000). However, employee turnover, which occurs as a result of the sorting effect of competitive HR systems, erodes established internal networks between employees (Yanadori & Cui, 2013). Consequently, employees that flow into a firm have superior external networks to internal networks and will rely more on external knowledge because of the superiority of their external networks. Given that such networks mainly act as useful sources for new and non-redundant knowledge (Zhou, Hong, & Liu, 2013), employees' tendency to stick to external networks under competitive HR systems leads to knowledge expansion. As a result, employees who perceive competitive HR systems will engage in knowledge expansion.

*Hypothesis 1. Employees' perceptions of competitive HR systems are positively related to knowledge expansion.*

**Cooperative HR systems and knowledge sharing** Although SHRM literature has highlighted the role of shared goals and, in turn, cooperation induced by HR systems on performance, most of the prior studies have not

examined the role of HR systems that are specifically intended to facilitate internal cooperation among employees. Even the few studies that focus on collaboration-facilitating or network-building functions of HR systems (e.g., Collins & Clark, 2003; Zhou et al., 2013) have not pinpointed the aspects of internal cooperation, as they use a broader concept of collaboration, including members outside focal firms. Thus, the present study defines cooperative HR systems that facilitate cooperation among members within the firm and reveals how such systems can induce knowledge sharing.

Social interdependence theory argues that if employees' goals are positively correlated, the situation is regarded to be cooperative, and employees are likely to exhibit more cooperative behavior (Chen, Chen, & Meindl, 1998; Swab & Johnson, 2019). In this vein, prior SHRM studies on cooperation have consistently emphasized the role of shared organizational goals (e.g., Collins & Smith, 2006; Gooderham, Parry, & Ringdal, 2008). Given the concept of cooperation in prior studies, the present study defines cooperation as a situation in which two or more people act together to achieve shared goals. Further, the present study also defines cooperative HR practices as formal procedures that are designed to establish positive interdependence and facilitate social exchange among employees to achieve shared goals. Adopting and extending this definition to cooperative HR systems, the present study posits that employees' perception of cooperative HR systems elicits knowledge sharing. By encouraging employees to perceive common organizational goals and prioritize them over individual goals, employees' perceptions of cooperative HR systems can foster the

willingness of employees to engage in social interaction.

In terms of the social exchange perspective, increased goal and task interdependence facilitates social interaction among employees and, in turn, increases the frequency of exchange. Over time, employees are likely to trust one another as the number of exchange increases (Collins & Smith, 2006; Whitener, Brodt, Korsgaard, & Werner, 1998). Such trust is formed implicitly through the norm of reciprocity (Flynn, 2005; Gouldner, 1960), or explicitly as employees develop norms for recognizing mutual contributions and impose sanctions for social loafing over time (Collins & Smith, 2006; Leana III & Van Buren, 1999). As the frequency of exchange and the degree of trust increase, employees are more likely to identify themselves at a relational or collective level because trust gives employees the confidence of cooperation, which is the perceived level of certainty that other employees will pursue mutually compatible interests (Das & Teng, 1998). Subsequently, due to the sense of interpersonal or collective identity, they prefer a reciprocal and generalized exchange, such as extensive knowledge sharing (Flynn, 2005). Moreover, prior research on knowledge showed the possibility that HR practices that include interpersonal cooperation can facilitate knowledge sharing in an organization (e.g., Cabrera & Cabrera, 2005; Wang & Noe, 2010). Thus, the present study posits that employees' perceptions of cooperative HR systems elicit individual knowledge sharing behavior.

*Hypothesis 2. Employees' perceptions of cooperative HR systems are positively related to knowledge sharing.*

## **KMBs and Distinct Types of Creativity**

Extending the arguments of prior studies and following the suggestions of Gilson and Madjar (2011) and Madjar et al. (2011), the present study also divides creativity into radical and incremental creativity. The present study adopts Madjar et al. (2011)'s definition of radical creativity, which is referred to as ideas that differ substantially from the organization's existing practices and alternatives. Thus, to enhance radical creativity, it is necessary to acquire new skills and make a commitment to a new course of action (Lubatkin, Simsek, Ling, & Veiga, 2006). By acting as a "centrifugal" force that pulls employees outward in search of new routines and practices (Jiang & Chen, 2018), external knowledge acquisition can fulfill requirements necessary to achieve radical innovation. Moreover, such external knowledge may refresh employees' "thought worlds" or work routines to which employees are accustomed (Jiang & Chen, 2018), enabling them to initiate creativity that is highly deviated from their routine work. Thus, given the importance of new external knowledge in stimulating radical creativity, the knowledge expansion induced by the perceived competitive HR systems elicits employees' radical creativity.

*Hypothesis 3. Knowledge expansion is positively related to radical creativity.*

Contrary to radical creativity, incremental creativity is referred to as suggesting minor changes or modifications to the existing practices of organizations and accumulating small improvements (Madjar et al., 2011). It builds on existing knowledge and reinforces existing skills, processes, and

structures, pursuing efficiency (Jansen et al., 2006). Thus, in terms of eliciting incremental creativity, exploiting internal knowledge is of more importance than exploring external knowledge. Moreover, in enhancing the exploitation of internal knowledge, knowledge sharing among employees is indispensable. For example, to achieve improvement in a particular employee's task, which is a small part of the production line, more profound knowledge of pre- or post-processing from his or her part in the production cycle is required. Such knowledge can be acquired through continuous interaction among his or her coworkers and the accumulation of internal knowledge dispersed among employees. When employees engage in knowledge sharing, such as the process of searching for and providing task-relevant information from members' unique expertise and experience, the existing repertoire of thinking is enriched or adjusted by alternative perspectives from other members, such that cognitive pathways are flexibly explored with attention given to previously overlooked aspects of the task (Amabile, 1988; Jiang & Chen, 2018).

*Hypothesis 4. Knowledge sharing is positively related to incremental creativity.*

## **The Mediating Roles of KMBs**

Hypotheses 1 and 2 predict positive relationships between perceived competitive HR system and knowledge expansion, and perceived cooperative HR system and knowledge sharing, respectively. Further, hypotheses 3 and 4 predict the positive effects of knowledge expansion on radical creativity and knowledge sharing on incremental creativity,

respectively. Considered together, these hypotheses indicate a model in which knowledge expansion mediates the relationship between competitive HR system and radical creativity, and knowledge sharing mediates the relationship between cooperative HR system and incremental creativity. The concept of this model is in line with the theoretical underpinnings of prior SHRM and creativity literature. First, prior SHRM literature suggests that HR systems affect performance through their influences on employees' attitudes and behaviors (Kehoe & Collins, 2017; Liao et al., 2009). Second, knowledge has been regarded as a fundamental raw material for creativity (Ohlsson, 2011; Rhee & Choi, 2017) and, in turn, KMBs such as knowledge exchange and acquisition were examined as substantive predictors of creativity (e.g., Gong, Kim, Zhu, & Lee, 2013; Rhee & Choi, 2017). Especially, the present study hypothesizes that KMBs partially mediate the relationships between HR systems and creativity in that prior literature on SHRM insisted the direct relationship or different mediating mechanisms between HR systems and creativity (e.g., Chang et al., 2014; Liu et al., 2017).

*Hypothesis 5a. Knowledge expansion partially mediates the positive relationship between employees' perceptions of competitive HR systems and radical creativity.*

*Hypothesis 5b. Knowledge sharing partially mediates the positive relationship between employees' perceptions of cooperative HR systems and incremental creativity.*

## **The Moderating Roles of Work-specific Cognitive Styles**

The present study posits that employees' work-specific cognitive styles can act as a boundary condition in the relationship between KMBs and distinct types of creativity. The literature on creativity acknowledges that generating creative ideas is based on cognitive processes such as combining and reorganizing the structure of knowledge and information (Baughman & Mumford, 1995; Sung & Choi, 2012). Cognitive styles are reflected in patterns of individuals' behavior that characterize the way they approach tasks and affect the way they think and act, including information processing (Perkins, 1981; Sagiv et al., 2000). Therefore, by affecting how they think and behave with their extant knowledge, individual work-specific cognitive styles can affect creativity in the workplace. Further, given that prior studies on creativity suggested that a cognitive style is associated with both creativity-relevant processes and creativity (Amabile, 1996; Sagiv et al., 2000; Taggar, 2002), it is reasonable to anticipate the moderating roles of the cognitive style on the relationship between KMBs and distinct types of creativity. Especially, this study examines the intuitive and systematic work style of employees, which conceptualize employees' contrasting cognitive styles of information and knowledge processing.

***Intuitive work style*** Intuitive work style refers to the tendency of employees to analyze information and knowledge from a variety of examples simultaneously and link various areas of thought with imagination (Sagiv et al., 2000; Scott & Bruce, 1994). Thus, employees with an intuitive work style analyze a given situation in their workplace with various perspectives. Further, they reorganize their knowledge and information and

capture a pattern without accounting for the source of the knowledge or information, relying on their feelings and intuition (Sagiv et al., 2000; Scott & Bruce, 1995). As a result, they can easily shift their extant perspectives without constraints from logic or rules in their workplace (Sung & Choi, 2012) and come up with original solutions to problems they encounter in their work. Prior studies reinforced this argument by concluding that intuitive cognitive style is positively related to individual creativity (e.g., Sagiv et al., 2000; Smith & DeCoster, 2000). Therefore, the present study posits that employees' intuitive work style positively moderates the relationship between knowledge expansion and radical creativity and knowledge sharing and incremental creativity, respectively.

*Hypothesis 6a. Employees' intuitive work style positively moderates the relationship between knowledge expansion and radical creativity, such that the relationship is more positive when employees' intuitive work style is strong than when it is weak.*

*Hypothesis 6b. Employees' intuitive work style positively moderates the relationship between knowledge sharing and incremental creativity, such that the relationship is more positive when employees' intuitive work style is strong than when it is weak.*

**Systematic work style** A systematic work style is the tendency of employees to logically and intentionally analyze situations, relying on consistent rules and disciplinary boundaries (Sagiv et al., 2000). Thus, employees with a systematic work style tend to follow regular methods and clear procedures when they work, choosing ways of acting following clear

and systematic standards (Perkins, 1981; Scott & Bruce, 1995; Sagiv et al., 2000). Since they stick to regular processes and instructions when they perform tasks in the workplace, knowledge and information in their knowledge reservoir is less likely to be recombined in a novel and unconventional way, which is regarded as one of the core steps in creative thinking processes. As a result, with a highly systematic work style, the process of exerting creativity from employees' knowledge is likely to be suppressed. That is, employees' internal and external knowledge obtained through knowledge sharing or expansion cannot be converted into creative solutions, precluding employees from suggesting solutions highly deviated from conventions in their work. Previous studies revealed that an intuitive cognitive style is positively associated with creativity rather than a systematic one. Further, Scott and Bruce (1994) demonstrated that employees' innovative behavior correlates negatively with systematic decision-making style. Therefore, the present study suggests that employees' systematic work style negatively moderates the relationship between knowledge expansion and radical creativity and knowledge sharing and incremental creativity, respectively.

*Hypothesis 7a. Employees' systematic work style negatively moderates the relationship between knowledge expansion and radical creativity, such that the relationship is less positive when employees' systematic work style is strong than when it is weak.*

*Hypothesis 7b. Employees' systematic work style negatively moderates the relationship between knowledge sharing and*

*incremental creativity, such that the relationship is less positive when employees' systematic work style is strong than when it is weak.*

### **III. METHOD**

#### **Sample and Procedures**

The theoretical framework of this study is tested by collecting data from employees and team leaders from 27 firms. To avoid common method biases, data on perceived HR systems, KMB, and individual work styles were collected from employees, and the team leaders of the employees who participated in the survey were those who evaluated the level of individual creativity. A total of 66 team leaders and 200 employees in 27 companies participated in the present study. After excluding data that are not matched between the leader and their employees, 65 leader surveys were able to be matched with 182 member surveys for 65 teams in these 27 companies. The demographic characteristics of individual employees were as follows: 75.8% of employees were male; 95.6% of them were Korean; 78.0% of them had earned a bachelor's degree, and 13.2% of them had earned a master's degree or Ph.D.; their average age was 36.34 ( $SD=7.06$ ); and their average tenure in current team was 3.28 years ( $SD=3.72$ ).

#### **Measures**

All study variables were assessed by using multi-item measures with a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Because all the measures developed or adopted in the

present study were originally in English, they were first translated to Korean by three HR scholars, and back-translation procedures (Brislin, 1980) were followed.

***Competitive and cooperative HR systems*** Since a measure exactly fitted with the concepts for competitive and cooperative HR systems in the present study did not exist, a measure for each HR system was newly developed. Several possible items for this measure were developed by drawing from previous literature. First of all, the present study reviewed a broad array of SHRM studies published in major journals and identified significant HR policies most frequently used in prior studies within the three primary HR policy domains based on Jiang, Lepak, Han, Hong, Kim, and Winkler (2012b)'s recommendation: Recruitment and training in KSAs, performance appraisal, compensation and promotion in motivation, and employee involvement and job design in opportunities. Next, by thoroughly identifying and modifying related items in each HR policy used in prior research, a preliminary set of items was developed. Again, the items were refined based on content validity evaluations about whether each item is relevant to the concept of competition and cooperation by three subject matter experts. They were asked to evaluate the extent to which the proposed items reflect cooperate or competitive aspects of HR practices in which they were included. The final measures include nine items in cooperative HR systems: two items in the KSAs domain; five items in the motivation domain; and two items in the opportunities domain ( $\alpha = .78$ ); a sample item is "Our firm provides training to improve teamwork and

interpersonal skills of employees.”; and eight items in competitive HR systems: two items in the KSAs domain; five items in the motivation domain; and one item in the opportunities domain ( $\alpha = .75$ ); a sample item is “Our performance appraisal process mainly focuses on relative comparison of employees.” To create an aggregate index of each HR system, the mean scores for the performance appraisal policy and compensation and reward policy were computed, which each have two items. Next, aggregate scores for each of the three HR policy domains were made by computing the mean scores of HR policies affiliated to each HR domain. Finally, three HR policy domain scores were combined into one aggregate HR system by averaging all of the domain scores. While no factor analysis was conducted for the items of each HR system, this is not a cause for concern because the HR system measures used in the present study were constructed based on the criteria of a formative model (MacKenzie, Podsakoff, & Jarvis, 2005), which assumes that each HR domain captures a unique aspect of specific HR systems that are not captured by other domains (Jiang et al., 2012b). In the formative HR system measure, therefore, it is not appropriate to expect all policies or practices to load on a single factor or strongly correlate with each other (MacDuffie, 1995; Jiang et al., 2012b). Furthermore, it is reasonable to assume that there is considerable variation in the specific practices that are used within HR systems (Jiang et al., 2012b). So, while a factor analysis is useful in demonstrating the trend of whether the practices are used together and the discriminant validity of two different systems (Kehoe and Collins, 2017), it is not an appropriate method

for HR systems measures in this study.

***Knowledge expansion*** Three items were adapted from Kehoe and Collins's (2017) access to knowledge in other units and outside the firm scales, and an original item was added to assess employees' knowledge expansion. Items were selected and modified to reflect employee's behavior of expanding their boundary of knowledge which does not overlap with the existing knowledge of other members in their group, who can be potential competitors of them. As a result, items for assessing knowledge access within the unit were excluded. A sample item is "I acquire new knowledge and information from contacts outside the organization that my unit does not already possess." The scale showed good internal consistency reliability ( $\alpha = .76$ ).

***Knowledge sharing*** Knowledge sharing was measured with four items adapted from Chuang et al. (2016) and Faraj and Sproull (2000) to assess employees' knowledge sharing. To emphasize the contrast between knowledge sharing and expansion, original items were adapted to reflect the activity of the employee's knowledge sharing with other members of their group. All items used a single employee as the referent, instead of "team" as in the original items. A sample item is "I share my special knowledge and expertise with one another in my team." The items for knowledge sharing also showed good internal consistency reliability ( $\alpha = .88$ ).

The assumption of the present study is that knowledge expansion and sharing are distinct constructs. A series of confirmatory factor analyses (CFAs) yielded results that show that the two-factor model ( $\chi^2(19) = 29.98$ ,

RMSEA = .06, CFI = .98, SRMR = .05) showed significantly better fit than the one-factor model ( $\chi^2(20) = 202.91$ , RMSEA = .22, CFI = .69, SRMR = .16,  $\Delta\chi^2(1) = 172.93$ ,  $p < .01$ ). These analyses provided support for treating knowledge expansion and sharing as two distinguished constructs.

***Intuitive work style*** Three items were adapted from Sung and Choi (2012) to assess the intuitive work style of employees. Although the original items were used to assess the general cognitive style of leaders, the items were modified to reflect employees' specific work context. A sample item is "When I do my job or task, I try to find new ways to solve existing problems". All items used showed good internal consistency reliability ( $\alpha = .81$ ).

***Systematic work style*** Three items were adopted from Sung and Choi (2012) to assess the systematic work style of employees and modified the items to reflect employees' specific work context. A sample item is "When I do my job or task, I try to adhere to systematic procedures related to my job." All items showed good internal consistency reliability ( $\alpha = .90$ ).

***Radical and incremental creativity*** Items were adopted from Madjar et al. (2011)'s radical and incremental creativity scale to measure the two types of creativity. Team leaders rated the radical and incremental creativity of their employees who participated in this survey.

Three items were used to assess employees' radical creativity. A sample item is "This employee demonstrates a high level of originality in doing his/her work or solving problems." All items used showed good internal consistency reliability ( $\alpha = .89$ ).

Three items were used to assess employees' incremental creativity. A sample item is "This employee uses previously existing ideas or work in an appropriate new way." All items used showed good internal consistency reliability ( $\alpha = .80$ ).

A series of CFAs were conducted to examine the discriminant validity of radical and incremental creativity. The result showed the two-factor model ( $\chi^2(8) = 22.37$ , RMSEA = .09, CFI = .97, SRMR = .04) has significantly better fit than the one-factor model ( $\chi^2(9) = 128.57$ , RMSEA = .27, CFI = .78, SRMR = .11,  $\Delta\chi^2(1) = 106.21$ ,  $p < .01$ ), providing support for the discriminant validity of two distinct concepts of creativity.

***Control variables*** Following prior literature of knowledge management and creativity in individual level (e.g., Chae & Choi, 2019; Rhee & Choi, 2017; Sung, Antefelt, & Choi, 2017), the effects of gender (1 = male, 2 = female), education (1 = less than high school degree, 2 = high school degree or equivalent, 3 = associate degree, 4 = bachelor's degree, 5 = master's degree or above), and hierarchical order (1 = associate, 2 = assistant manager, 3 = manager, 4 = senior manager, 5 = director or above) were controlled for. Only hierarchical order was included rather than age and the tenure in the current organization because the correlation between hierarchical order and age ( $r = .74$ ,  $p < .01$ ) and the tenure in current organization ( $r = .59$ ,  $p < .01$ ) is high and hierarchical order is considered to be more relevant to the knowledge management and creativity of employees who work with a specific context of groups. Individual tenure in the current team (Hirst, van Knippenberg, & Zhou, 2009) and the job category of

employees (1 = administration, 2 = marketing, sales and service, 3 = R&D, 4 = production and engineering, 5 = IT, 6 = others) were also controlled for, given the difference of required knowledge management or creativity in terms of job types or requirements (Shalley, Zhou, & Oldham, 2004; Sung et al., 2017). Gender and job category variables were effect-coded.

### **Analytical Strategy**

To increase the ratio of sample size to free parameters, a structural path analysis that employs scale means of each variable instead of item-level indicators was used (Bandalos & Finney, 2001; Sung & Choi, 2018). Given the nested nature of data (e.g., employees in the same group share the same team leader), all hypotheses in the present study were tested with Mplus version 8.3 (Muthén & Muthén, 2017) to control for the effect of differences between groups. To examine indirect relationships among the variables, Monte Carlo bootstrapping was used to calculate the 95% confidence intervals (CIs) for both the indirect effects, conditional indirect effects, and the difference between the conditional indirect effects. Because the sampling distribution of the product deviates from a normal distribution, it is recommended that Monte Carlo confidence intervals be computed for significance testing of indirect effects, especially in the nested data structure (Preacher & Selig, 2012). Further, all variables (except the product term and effect-coded variables) were first grand-mean centered to lower the possibility of multicollinearity (Aiken & West, 1991) and increase the convenience of interpretation of the results.

## **IV. RESULTS**

## **Construct Validity**

A series of CFAs were conducted to examine whether the scale variables obtained from employees (e.g., knowledge expansion and sharing, intuitive and systematic work style) provide support for the discriminant validity. The results of CFAs indicate that the hypothesized four-factor model ( $\chi^2(71) = 108.94$ , RMSEA = .05, CFI = .97, SRMR = .05) showed significantly better fit than (a) the first three-factor model (in which the items for knowledge expansion and sharing loaded on a single factor) ( $\chi^2(74) = 316.58$ , RMSEA = .13, CFI = .80, SRMR = .13,  $\Delta\chi^2(3) = 207.64$ , p < .01), (b) the second three-factor model (in which the items for intuitive and systematic work style loaded on a single factor) ( $\chi^2(74) = 451.45$ , RMSEA = .17, CFI = .69, SRMR = .13,  $\Delta\chi^2(3) = 342.51$ , p < .01), or (c) the two-factor model (in which the items for knowledge expansion and sharing loaded on one factor and those for intuitive and systematic work style loaded on another factor) ( $\chi^2(76) = 657.34$ , RMSEA = .21, CFI = .53, SRMR = .17,  $\Delta\chi^2(5) = 548.40$ , p < .01). These results provided support for the hypothesized four-factor model as distinct constructs in the present study.

## **Hypothesized Model and Alternative Models**

In the light of the possibility that theoretically plausible alternative models can explain an observed pattern in the data better (Anderson and Gerbing, 1988), the present study compares the hypothesized structural model to a couple of theoretically plausible alternative models. First, under the competitive situation, employees can engage in knowledge sharing to

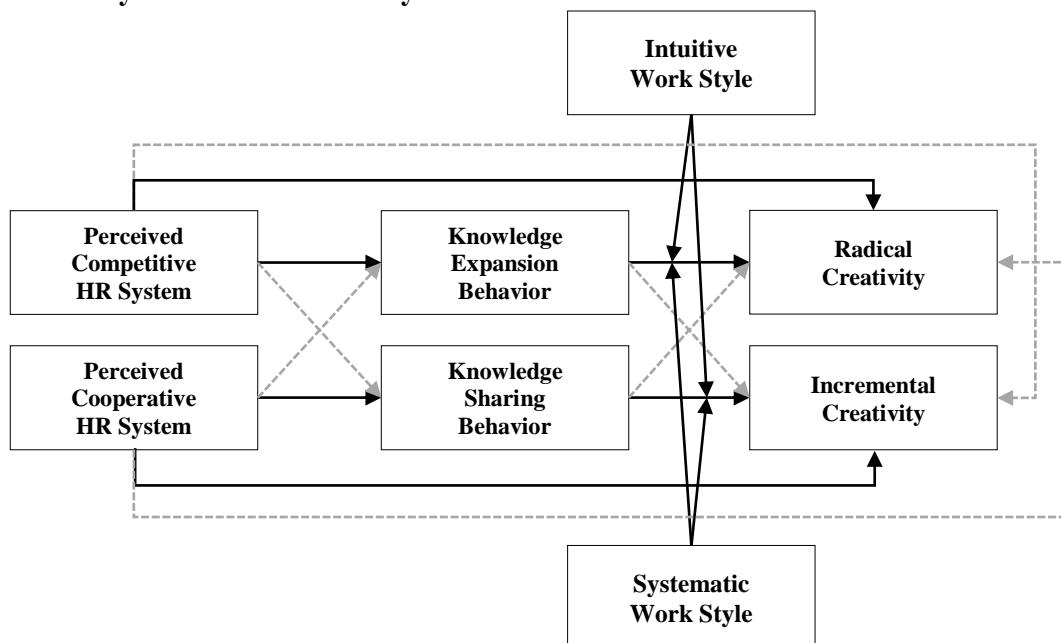
discover what their competitors think and know (Tsai, 2002). Further, under the cooperative situation, people can expand their boundary of knowledge to consistently share knowledge with others or better achieve shared goals.

Therefore, the possibility of the cross effects of the two HR systems on knowledge expansion and sharing is examined, i.e., whether competitive and cooperative HR systems predict both knowledge expansion and sharing.

This model fitted the data adequately ( $\chi^2(90) = 126.55$ ,  $p < .01$ , RMSEA = .05, CFI = .90, SRMR = .07) and showed a significantly improved fit than the initially hypothesized structural model ( $\chi^2(94) = 151.69$ ,  $p < .01$ , RMSEA = .06, CFI = .85, SRMR = .08,  $\Delta\chi^2(4) = 25.14$ ,  $p < .01$ ). Second, it is possible that knowledge sharing also induces radical creativity by sharing external knowledge among members. Also, knowledge expansion can facilitate incremental knowledge by accessing knowledge related to current work (Perry-Smith & Shalley, 2003). Therefore, based on the first alternative model, we add additional paths to test the possibility of cross effects of the two KMBs on radical and incremental creativity, that is, whether knowledge expansion and sharing facilitate both radical and incremental creativity. This model showed a significantly improved fit than the first alternative model ( $\chi^2(88) = 119.73$ ,  $p < .05$ , RMSEA = .05, CFI = .92, SRMR = .07,  $\Delta\chi^2(2) = 6.82$ ,  $p < .05$ ). Finally, based on the second alternative model, tests examined the possibility of cross moderation of intuitive and systematic work style, that is, two work-specific cognitive styles of employees moderating all the paths from knowledge expansion and sharing to radical and incremental creativity. This cross moderation model

showed inferior model fit, and the chi-square difference was not significant ( $\chi^2(84) = 117.78$ ,  $p < .01$ , RMSEA = .05, CFI = .91, SRMR = .07,  $\Delta\chi^2(4) = 1.95$ ,  $p > .05$ ), compared to the first alternative model. Thus, the second alternative model, which added a cross effect between the relationship of two HR systems and KMBs, was selected as the final model (see figure 1)<sup>1</sup>.

**Figure 1. Final Structural Model of the Relationship between Perceived HR Systems and Creativity**



Note: Dashed lines are not included in the hypotheses but tested.

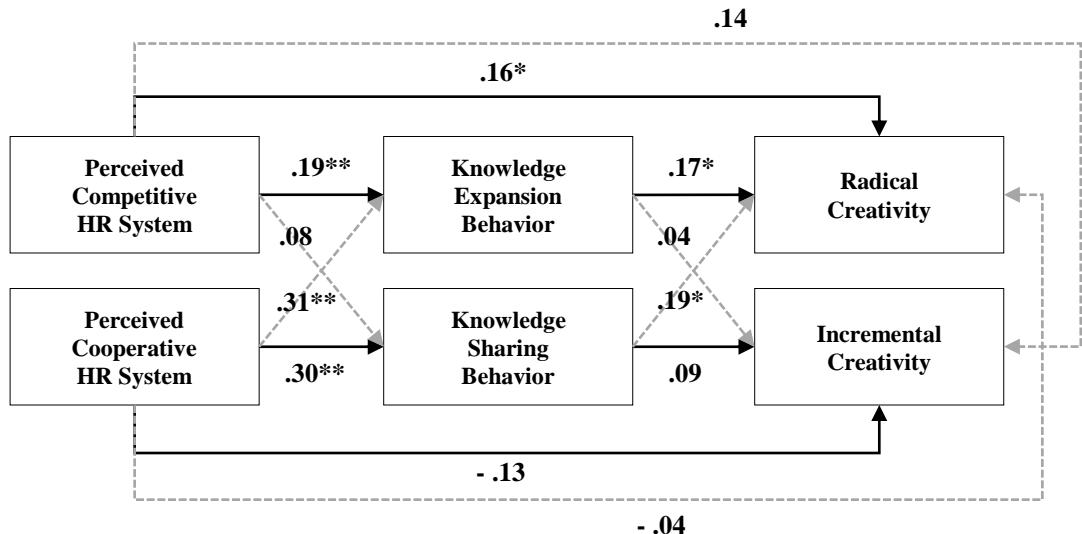
<sup>1</sup> The full mediation model was examined, which excluded four direct paths between HR systems and two types of creativity from our final model (in figure 1). This model showed similar model fit to our final model, and chi-square difference was not significant ( $\chi^2(92) = 126.88$ ,  $p < .01$ , RMSEA = .05, CFI = .91, SRMR = .07,  $\Delta\chi^2(4) = 7.15$ ,  $p > .05$ ). Nevertheless, the present study selected the final partial mediation model due to the methodological issue. A shortcoming of testing mediation through SEM with smaller samples is that the direct effect of an independent variable on a dependent variable in the mediation model has less power as sample size decreases. Therefore, it is likely that the direct effect is nonsignificant in testing partial mediation, increasing the probability that researchers incorrectly conclude that full mediation exists in a study model (Kehoe & Collins, 2017; Rucker, Preacher, Tormala, & Petty, 2011). Considering the sample size of the present study and the theoretical rationale together, it was concluded that the partial mediation model is more proper than the full mediation model.

## Hypotheses Testing

Table 1 shows the descriptive statistics and correlations for all the study variables at the individual level.

First, to test Hypothesis 1, 2, 3, 4, and 5a and 5b, the present study tested a model with the relationships between HR systems and creativity via knowledge expansion without work-specific cognitive styles as moderators. Since the correlation between radical and incremental creativity was relatively high, the residual variances of these two variables were covaried. Figure 2 shows the standardized results of this analysis and the model shows a reasonable fit with the data ( $\chi^2(18) = 33.12$ ,  $p < .05$ , RMSEA = .07, CFI = .91, SRMR = .05).

**Figure 2. Results of the Main Effect Model**



Note: N=182, R<sup>2</sup> radical creativity= .15\*\*, R<sup>2</sup> incremental creativity= .08\*, Standardized coefficients are presented. Dashed lines are not included in the hypotheses but tested.  
\* $p < .05$ , \*\* $p < .01$ .

Hypothesis 1 proposed that perceived competitive HR system is

**Table 1. Means, Standard Deviations, and Correlations for Variables**

	Mean	SD	1	2	3	4	5	6	7	8	9
1. Gender (effect coded)	-.52	.86	—								
2. Education	4.02	.54	.07	—							
3. Hierarchical order	2.59	1.12	<b>-.27**</b>	.11	—						
4. Job Category 1 (effect coded)	.43	.71	-.05	.10	<b>.23**</b>	—					
5. Job Category 2 (effect coded)	-.01	.50	-.20	.12	<b>.22**</b>	<b>.37**</b>	—				
6. Job Category 3 (effect coded)	-.04	.46	-.09	.05	<b>.16*</b>	<b>.44**</b>	<b>.55**</b>	—			
7. Job Category 4 (effect coded)	-.07	.43	<b>-.21**</b>	-.04	<b>.28**</b>	<b>.51**</b>	<b>.59**</b>	<b>.63**</b>	—		
8. Job Category 5 (effect coded)	-.08	.41	<b>-.18*</b>	.03	<b>.26**</b>	<b>.55**</b>	<b>.62**</b>	<b>.65**</b>	<b>.69**</b>	—	
9. Tenure in the current team	3.28	3.72	-.09	.05	<b>.35**</b>	-.01	.09	.06	.09	<b>.24**</b>	—
10. Competitive HR system	2.90	.59	.05	-.00	<b>.25**</b>	.05	-.06	.07	-.03	.04	<b>.15*</b>
11. Cooperative HR system	3.54	.55	-.12	.12	.13	.01	.07	-.01	-.05	.04	.09
12. Knowledge expansion	3.48	.67	-.11	.14	<b>.26**</b>	.09	.10	-.05	-.07	.07	.07
13. Knowledge sharing	3.99	.59	-.04	.06	.07	.01	-.01	-.11	-.08	-.08	.04
14. Radical creativity	3.46	.73	-.03	.09	<b>.24**</b>	.06	.04	.03	.03	.06	.09
15. Incremental creativity	3.80	.60	-.07	.02	<b>.18**</b>	.09	-.06	.01	-.01	.02	.05
16. Intuitive work style	3.87	.61	-.12	.14	<b>.17**</b>	-.04	-.00	-.04	-.10	-.02	<b>.18*</b>
17. Systematic work style	3.85	.68	-.01	-.01	.03	.06	-.00	-.03	.03	.08	.01

Note: N=182. SD = Standard deviation.

\* $p < .05$ , \*\* $p < .01$ .

**Table 1. Means, Standard Deviations, and Correlations for Variables (Cont'd)**

	Mean	SD	10	11	12	13	14	15	16	17
10. Competitive HR system	2.90	.59	—							
11. Cooperative HR system	3.54	.55	.28***	—						
12. Knowledge expansion	3.48	.67	.30***	.42***	—					
13. Knowledge sharing	3.99	.59	.15*	.34***	.24**	—				
14. Radical creativity	3.46	.73	.26***	.15*	.28***	.24***	—			
15. Incremental creativity	3.80	.60	.18*	.02	.09	.10	.50***	—		
16. Intuitive work style	3.87	.61	.22***	.31***	.51***	.37***	.21***	.15*	—	
17. Systematic work style	3.85	.68	.18*	.08	.02	.20***	.01	.07	.10	—

Note: N=182. SD = Standard deviation.

\* $p < .05$ , \*\* $p < .01$ .

positively related to knowledge expansion, and hypothesis 2 proposed that perceived cooperative HR system is positively related to knowledge sharing. Results show that perceived competitive and cooperative HR systems are significantly related to knowledge expansion and sharing ( $\beta = .19$ ,  $p < .01$  and  $\beta = .30$ ,  $p < .01$ , respectively). This supports hypothesis 1 and 2.

Hypothesis 3 and 4 propose that knowledge expansion is positively related to radical creativity and that knowledge sharing is positively related to incremental creativity. As reported in Figure 2, the path coefficient between knowledge expansion and radical creativity was significantly positive. Therefore, hypothesis 3 is supported. However, the path coefficient between knowledge sharing and incremental creativity was not significant. Therefore, hypothesis 4 is not supported.

Hypothesis 5a proposed that knowledge expansion partially mediates the relationship between perceived competitive HR system and radical creativity, and hypothesis 5b proposed that knowledge sharing mediates the relationship between perceived cooperative HR system and incremental creativity. Table 2 shows the Monte Carlo confidence intervals for the indirect effect of perceived competitive HR systems on radical creativity via knowledge expansion and that of perceived cooperative HR systems on incremental creativity via knowledge sharing. The 95% Monte Carlo CIs of the indirect effect of perceived competitive HR systems excluded zero ( $b_{ind} = .04$ ,  $CI_{95\%} = [.001, .099]$ ). Further, the direct relationship between competitive HR systems and radical creativity was also significant ( $\beta = .16$ ,  $p < .05$ ). Thus, knowledge expansion partially mediates

**Table 2. Total Indirect Effects Using Monte Carlo Confidence Intervals**

Independent Variables	Mediators	Dependent Variables	Coefficient ( <i>b</i> ) <sup>a</sup>	95% LLCI <sup>b</sup>	95% ULCI <sup>b</sup>
Competitive HR System	Knowledge Expansion	Radical Creativity	.041*	.001	.099
Cooperative HR System	Knowledge Sharing	Incremental Creativity	.030	-.019	.088

Note: N= 182.; LLCI = Lower limit confidence interval; ULCI = Upper limit confidence interval.

<sup>a</sup> Unstandardized coefficients are shown.

<sup>b</sup> These values are calculated based on the unstandardized path coefficients by using Monte Carlo simulation (<https://amplab.shinyapps.io/MEDMC/>).

\* 95% confidence interval excludes zero.

the relationship between perceived competitive HR system and radical creativity, supporting hypothesis 5a. However, 95% Monte Carlo CIs of the indirect effect of perceived cooperative HR systems included zero ( $b_{ind} = .03$ ,  $CI_{95\%} = [-.019, .087]$ ). Thus, hypothesis 5b is not supported.

To examine the moderating roles of work-specific cognitive styles in the relationship between KMBs and distinct types of creativity, the present study tested the moderated mediation model which includes all the proposed relationships including two moderators, as shown in figure 1.

Table 3 shows the results and standardized coefficients of our moderated mediation model. Hypothesis 6a and 6b hypothesized the positive moderating role of intuitive work style in the relationship between knowledge expansion and radical creativity (hypothesis 6a) and knowledge sharing and incremental creativity (hypothesis 6b). The results revealed that an intuitive work style acted as a moderator variable for the effect of knowledge expansion on radical creativity ( $\beta = .14$ ,  $p < .05$ ) and the effect of knowledge sharing on incremental creativity ( $\beta = .19$ ,  $p < .01$ ). Thus, hypothesis 6a and

**Table 3. Results of the Moderated Mediation Model**

Predictors	Mediators		Dependent Variables	
	Knowledge Expansion	Knowledge Sharing	Radical Creativity	Incremental Creativity
Intercept	-.09	-.10	<b>4.70**</b>	<b>6.17**</b>
Gender (effect-coded)	-.01	-.02	.04	-.04
Education	.03	-.00	.06	.02
Hierarchical order	<b>.16*</b>	-.02	<b>.17*</b>	.14
Job Category 1 (effect-coded)	.10	.10	-.02	.11
Job Category 2 (effect-coded)	.15	.03	-.03	-.12
Job Category 3 (effect-coded)	<b>-.17*</b>	-.09	-.03	.04
Job Category 4 (effect-coded)	<b>-.19*</b>	.05	.06	-.05
Job Category 5 (effect-coded)	.17	-.17	.08	.04
Tenure in the current team	<b>-.13*</b>	.00	-.05	-.04
Competitive HR system	<b>.20**</b>	<b>.09</b>	<b>.16*</b>	.10
Cooperative HR system	<b>.33**</b>	<b>.32**</b>	-.06	-.16
Knowledge expansion	-	-	.15	.01
Knowledge sharing	-	-	<b>.20**</b>	.06
Intuitive work style	-	-	.06	.15
Kno_exp X Int_sty	-	-	<b>.14*</b>	-
Kno_sharing X Int_sty	-	-	-	<b>.19**</b>
Systematic work style	-	-	-.11	-.00
Kno_exp X Sys_sty	-	-	.11	-
Kno_sharing X Sys_sty	-	-	-	-.03
<i>R</i> <sup>2</sup>		<b>.26**</b>	<b>.15**</b>	<b>.20**</b>
				<b>.12**</b>

Note: N=182. Standardized beta coefficients are shown. Kno\_sharing=Knowledge sharing; Kno\_exp=Knowledge expansion; Int\_sty=Intuitive work style; Sys\_sty=Systematic work style. All variables (except the product terms and effect-coded variables) are grand-mean centered.

\**p*< .05. \*\**p*< .01.

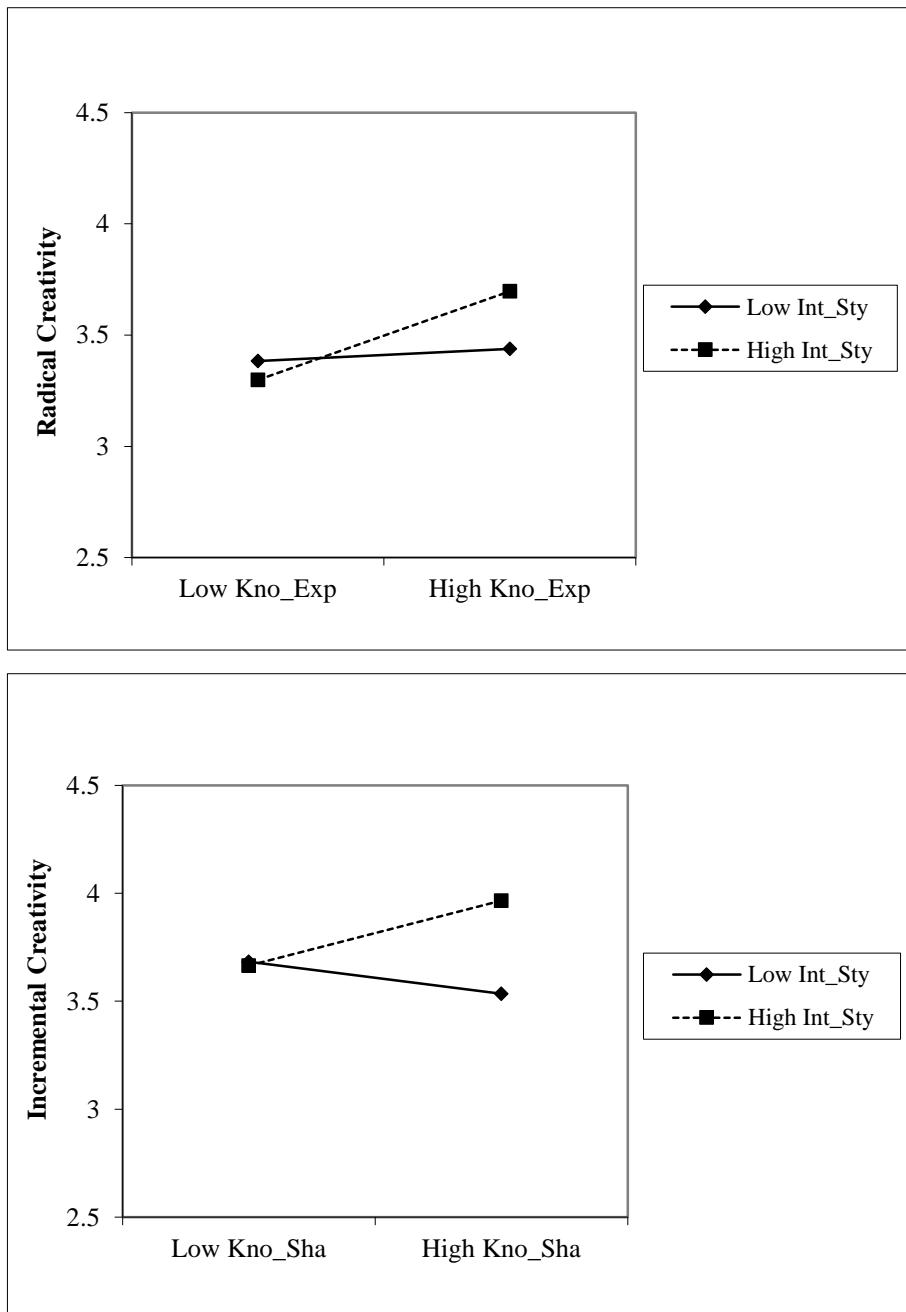
6b are supported.

Following the suggestions of Aiken & West (1991), these interaction effects were plotted by using values of one standard deviation

below and above the mean of intuitive work style to test whether the slope of lines significantly differed from zero. As shown in Figure 3, when the scores of intuitive work style are high, knowledge expansion and sharing have significantly positive effects on radical ( $b = .30, p < .05$ ) and incremental creativity ( $b = .25, p < .05$ ), respectively. However, the effects of knowledge expansion and sharing are not significant for low scores on intuitive work style ( $b = .04, ns.$  and  $b = -13, ns.$ , respectively). Hypothesis 7a and 7b proposed that systematic work style negatively moderates the relationships between KMBs and distinctive types of creativity. The results show that the interactions between KMBs and a systematic work style are not significant. Therefore, hypothesis 7a and 7b are not supported.

Furthermore, in the light of the entire structure of the present study's model, tests were also conducted on whether the indirect effect of perceived HR systems on different types of creativity through KMBs are moderated by work-specific cognitive style. Table 4 indicates the Monte Carlo confidence intervals of conditional indirect effects of perceived HR systems on distinctive types of creativity. First, the conditional indirect effect of perceived competitive HR system on radical creativity via knowledge expansion was not significant when the score of intuitive work style was low ( $b_{cond} = .01, CI_{95\%} = [-.043, .067]$ ) but significantly positive when the score of intuitive work style was high ( $b_{cond} = .07, CI_{95\%} = [.009, .147]$ ) and the difference between two conditional indirect effect was also significant ( $b_{diff} = .06, CI_{95\%} = [.002, .137]$ ). Further, the conditional indirect effect of perceived cooperative HR system on incremental creativity

**Figure 3. Interactions between KMBs and Intuitive Work Style in Predicting Distinct Types of Creativity**



Note: Kno\_Sha=Knowledge sharing; Kno\_Exp=Knowledge expansion; Int\_Sty=Intuitive work style

via knowledge sharing was not significant for the low score of intuitive work style ( $b_{cond} = -.04$ ,  $CI_{95\%} = [-.114, .035]$ ), but significantly positive for the high score of intuitive work style ( $b_{cond} = .08$ ,  $CI_{95\%} = [.010, .173]$ ) and the difference of two conditional indirect effect was also significant ( $b_{diff} = .12$ ,  $CI_{95\%} = [.032, .229]$ ). Thus, it is revealed that intuitive work style moderates both the indirect effects of perceived competitive and cooperative HR systems on radical and incremental creativity, respectively. However, the conditional indirect effect of competitive HR systems on radical creativity via knowledge expansion for the low score of systematic work style was not significant ( $b_{cond} = .01$ ,  $CI_{95\%} = [-.042, .071]$ ). Although the conditional indirect effect of competitive HR system was significantly positive for high score of systematic work style ( $b_{cond} = .06$ ,  $CI_{95\%} = [.007, .146]$ ), the difference between two conditional indirect effect was not significant ( $b_{diff} = .05$ ,  $CI_{95\%} = [-.006, .137]$ ). Further, the conditional indirect effect of cooperative HR system on incremental creativity via knowledge sharing was not significant for both low and high scores of systematic work style ( $b_{cond} = .03$ ,  $CI_{95\%} = [-.033, .099]$ , and  $b_{cond} = .02$ ,  $CI_{95\%} = [-.059, .094]$ , respectively), and the difference between two conditional indirect effects was not significant either ( $b_{diff} = -.01$ ,  $CI_{95\%} = [-.095, .063]$ ). Therefore, the results indicate that systematic work style does not act as a moderator of both the indirect effects of perceived competitive and cooperative HR systems on radical and incremental creativity, respectively.

## V. DISCUSSION

The primary goal of this study was to examine how distinct HR systems affect employees' creativity through their induced KMBs. First, this study contributes to the literature on creativity. Although a myriad of prior studies examined creativity and innovation, there have been limited understandings of whether and how SHRM, which acts as an important systematic contextual influence to employees, affects employees' creativity (Chang et al., 2014; Liu et al., 2017). Furthermore, there have been substantial calls for focusing on the multifaceted nature of creativity, which reflects diverse personal characteristics and working environments (Sung et al., 2017). The present study addresses these calls by shedding light on the influence process of two different HR systems on employees' distinctive types of creativity. Furthermore, the present study contributes to the SHRM literature by examining the roles of competitive and cooperative HR systems on employees' creativity in a field setting. Researchers in SHRM have extensively focused on cooperative aspects of HR systems as a driving force in superior firm performance (e.g., Collins & Smith, 2006; Kehoe & Collins, 2017). However, with a few exceptions (e.g., Henderson & Fredrickson, 2001; Yanadori & Cui, 2013), the literature on HR practices or systems that facilitate internal competition has long been mute in the field of SHRM (Sapegina & Weibel, 2017), although such practices are widely used in practice. Outside the SHRM literature, several studies have examined the effect of competition on individual or group performance. However, most of them were conducted in experimental settings, which could restrict the external validity of the results. In this regard, examining the role of HR

**Table 4. Monte Carlo Moderated Mediation Results**

Independent Variables	Mediators	Dependent Variables	Moderators	Moderator Level <sup>a</sup>	Conditional Indirect Effect	95% LLCI <sup>b</sup>	95% ULCI <sup>b</sup>
Competitive HR System	Knowledge Expansion	Radical Creativity	Intuitive Work Style	Low(-1SD)	.009	-.043	.067
			Systematic Work Style	High(+1SD)	<b>.066*</b>	<b>.009</b>	<b>.147</b>
	Sharing	Incremental Creativity	Difference	<b>.057*</b>	<b>.002</b>		<b>.137</b>
			Systematic Work Style	Low(-1SD)	.011	-.042	.071
Cooperative HR System	Knowledge Sharing	Incremental Creativity	High(+1SD)	<b>.064*</b>	<b>.007</b>		<b>.146</b>
			Difference	.053	-.006		.137
	Knowledge Sharing	Incremental Creativity	Low(-1SD)	-.037	-.114		.035
			High(+1SD)	<b>.082*</b>	<b>.010</b>		<b>.173</b>
Cooperative HR System	Knowledge Sharing	Incremental Creativity	Difference	<b>.118*</b>	<b>.032</b>		<b>.229</b>
			Systematic Work Style	.029	-.033		.099
	Sharing	Incremental Creativity	High(+1SD)	.015	-.059		.094
			Difference	-.014	-.095		.063

Note: Coefficients in bold indicate significant mediation; LLCI = lower limit confidence interval; ULCI = upper limit confidence interval.

<sup>a</sup> The value of the other moderator was fixed to mean when calculating conditional indirect effect.

<sup>b</sup> These values are calculated based on the unstandardized path coefficients by using Monte Carlo simulation (<https://amplab.shinyapps.io/MEDMC/>).

\* 95% confidence interval excludes zero.

systems which induces internal competition among employees is vital for filling the gap between the practice and academic research. Moreover, examining the effect of HR systems perceived by employees on individual performance, this study also communicates well with prior SHRM literature. SHRM researchers have suggested that the effect of HR practices on final outcomes can be different among employees depending on how they perceive HR practices (e.g., Bowen & Ostroff, 2004; Liao et al., 2009). The present study reveals that employees' perceptions of HR systems do affect distinctive types of individual creativity, supporting a proposition posited in a variety of SHRM literature. Finally, the current study also contributes to creativity and knowledge management literature by revealing in what boundary condition KMBs of employees more effectively relate to the exertion of employees' creativity.

## **Theoretical Implications**

This study elaborated on the two distinct HR systems that elicit employees' different KMBs. On the one hand, drawing on the social comparison perspective and sorting effect, the present study identifies that employees show knowledge expansion behavior when they perceive that the HR system is competitive due to the motivations for superior performance induced by emotions aroused from upward comparison and social network of employees (Lazear, 2000; Smith, 2000; Yanadori & Cui, 2013). On the other hand, relying on the social interdependence theory and social exchange perspective, the present study reveals that employees exhibit knowledge sharing behaviors as they perceive HR systems as cooperative

due to the increased social interaction and successive increase of trust among employees (Das & Teng, 1998; Flynn, 2005). The distinct effects of different HR systems on individual KMBs indicate that a simple, undifferentiated approaches to the intention of the HR systems in prior SHRM literature oversimplify the complex individual-level dynamics of HR systems on employees' behaviors that depend on the degree of facilitating competition or cooperation and how employees perceive the distinctive characteristics of HR systems.

Interestingly, although not included in the current set of hypotheses, employees' perceptions of cooperative HR systems are positively related to the knowledge expansion of employees as well as knowledge sharing. Under cooperative HR systems, employees engage in reciprocal or generalized exchange with other members in their groups. Further, this action of exchanging or sharing knowledge and information is not a one-off event but a repeated process among members, as long as they act together to achieve shared goals (Flynn, 2005). However, because the amount of knowledge an individual employee holds is limited, depending solely on knowledge sharing would eventually cause the depletion of new knowledge for sharing and the increase in overlap of knowledge among the members, making their further knowledge sharing meaningless. Therefore, employees would engage in knowledge expansion, as well as knowledge sharing, to maintain their reciprocal or generalized exchange among the members in their groups under cooperative HR systems. Knowledge expansion enables employees to maintain continuous knowledge sharing by expanding the

individual knowledge reservoir available for sharing knowledge among members (Jiang & Chen, 2018).

The present study also reveals the relationship between the KMBs and distinctive types of creativity. In regard to the KMBs, both knowledge expansion and sharing significantly elicited employees' radical creativity, but their incremental creativity was not related to either of the two KMBs. Researchers have extensively examined the relationship between knowledge sharing and creativity in diverse settings, but the results were inconsistent among studies (e.g., Gong et al., 2013; Rhee & Choi, 2017; Sung & Choi, 2018). Considered together with conflicting results of previous literature on knowledge and creativity, the result of the present study highlights the need to more precisely define the concept of creativity, reflecting its multifaceted nature, to precisely identify its potential antecedents or outcomes.

In particular, in contrast to the expectations of the present study, the relationship between knowledge sharing and incremental creativity is not significant, whereas radical creativity was significantly related to knowledge sharing. It is possible that incremental creativity needs more nuanced conditions to be exerted rather than those for radical creativity. Radical creativity is suggesting ideas substantially different from prior practices of teams or organizations. Thus, it might be exerted by expanding or exchanging knowledge that is substantially different from that already in the team's knowledge reservoir, requiring a less complicated reorganization of knowledge. However, incremental creativity should not only be related to but also different from the employees' existing practices. As a result,

incremental creativity cannot occur only with collecting knowledge significantly different from the previous one or sharing internal knowledge already in the knowledge reservoir of the team. It may require more complicated processes of recombining exchanged knowledge. Moreover, the effect of knowledge sharing on radical creativity is also significantly positive. Considering that employees' perceptions of cooperative HR systems were positively related to both knowledge expansion and sharing in the results of the current study, it is possible that boundary-spanning knowledge acquired through knowledge expansion by one employee would be conveyed to others simultaneously through the influence of reciprocal or generalized exchange under cooperative HR systems (Ancova, 1990; Marrone, 2010). Further, under the influence of cooperative HR systems where both knowledge expansion and sharing occur together, the relative effect size of each KMB on radical creativity can be different depending on whether a single employee has a broad knowledge base or a deep knowledge base (Zhou & Li, 2012). That is, whereas employees with a deep knowledge base can benefit more from knowledge expansion in exerting their radical creativity, employees with a broad knowledge base would benefit more from knowledge sharing in exerting radical creativity by connecting and integrating their broad knowledge in a novel and unconventional patterns (Zhou & Li, 2012). In this regard, further studies may explore in what condition and how knowledge expansion and sharing affect radical creativity under the influence of cooperative HR systems.

The results of the current study demonstrate that knowledge

expansion partially mediates the relationship between competitive HR systems and radical creativity. As expected, the direct relationship between competitive HR systems and radical creativity was significant despite the presence of knowledge expansion as a mediator. Considering that the prior literature on competitive or cooperative HR system and distinctive types of creativity is limited, future studies should examine further the mechanism of how competitive HR systems, or competition itself, affects the exertion of distinctive types of creativity in diverse levels. (Swab & Johnson, 2019).

As expected, the results also demonstrate that employees' intuitive work style positively moderated the relationship between knowledge expansion and radical creativity and knowledge sharing and incremental creativity, respectively. The indirect effects of perceived HR systems on employees' distinct types of creativity through KMBs are also positively moderated by the intuitive work style of employees. It indicates that how they perceive their situations and try to solve their problems in their workplace is vital for KMBs to be related to the actual exertion of creativity. Especially, the intuitive work style moderated the indirect effect of cooperative HR systems on incremental creativity via employees' knowledge sharing, despite a nonsignificant main effect of knowledge sharing on incremental creativity, showing a significantly positive relationship when the score of employees' intuitive work style is high. The result of the moderating effect of intuitive work style supports the present study's explanation for the insignificant relationship between knowledge sharing and incremental creativity. To generate creative ideas, employees

should actively combine and reorganize the structure of knowledge in their knowledge reservoir rather than just identifying relevant knowledge structures (Baughman & Mumford, 1995). Since incremental creativity starts from the knowledge which is already in the knowledge reservoir of the group and more familiar to employees, it is more exacting work for employees to make small changes or improvements by combining and reorganizing only extant internal knowledge. However, since intuitive work style improves the capacity of employees to recombine various components of their knowledge reservoir and makes them discover new solutions (Sung & Choi, 2012), employees with high scores on intuitive work style are able to achieve changes or modifications from existing practices in their work rather than those who are low in the score on intuitive work style. However, contrary to our expectation, the systematic work style does not have any moderating effect on the relationship between two KMBs and the distinct types of creativity. One possibility for this unexpected result is that the moderating effect of systematic work style can be different depending on the nature of the tasks in which employees are engaged. Sagiv et al. (2010) reported that people with a systematic style produce more creative ideas in structured and constrained situations in which people focus on a limited set of core elements or follow a prescribed, step-by-step procedure to solve problems. Thus, although it was not considered in the current study, different task characteristics of which employees are in charge of in their workplace may dilute the actual effect of systematic work style on the path between knowledge sharing and incremental creativity. Thus, future studies

may consider the specific dynamics between systematic work style and the nature of tasks to which employees attend when analyzing the effect of knowledge sharing on creativity.

## **Implications for Practice**

The current study also offers several important implications for practitioners. One of the most noteworthy results in our study is that competitive HR systems do affect employees' radical creativity directly and indirectly through knowledge expansion. Although a myriad of companies conventionally used competitive HR practices to motivate their employees to achieve superior performance in their work, there are recent debates among practitioners about the effect of HR practices facilitating internal competition. Further, the proactive abolition of such practices (e.g., forced ranking systems) in a few major companies in the U.S. intensifies the debate. However, the present study demonstrates that competitive HR systems are still effective in facilitating employees' radical creativity. While employees' perception of cooperative HR systems also indirectly affects employees' radical creativity, it is still necessary for companies to implement a competitive HR system, considering its total effect on radical creativity compared to that of a cooperative HR system. Given that radical creativity and innovation are regarded as indispensable factors for most of the companies to survive in a rapidly changing environment, the managers of firms should consider implementing or maintaining their competitive HR practices to enhance employees' radical creativity, balancing them with their cooperative HR practices.

The analyses of the present study also confirm that employees' intuitive work style acts as a boundary condition in the relationship between employees' KMBs and positively moderates the indirect effect of competitive HR systems on radical creativity and that of cooperative HR systems on incremental creativity, respectively. Specifically, knowledge sharing exhibited a significantly positive effect on incremental creativity when employees are highly intuitive in their work despite its insignificant main effect. Based on this result, managers may consider redeploying their human resources who show a highly intuitive work style in tasks that need more incremental creativity and, in turn, incremental innovation, following their market conditions. Although it is indispensable for companies to prepare for the rapidly changing future with radical innovation, it is also imperative to maintain and increase performance with incremental innovation in their current business area, achieving organizational ambidexterity. To maintain this ambidexterity of their organizations, managers could try to keep a balance between competitive and cooperative HR practices and retain their employees with a highly intuitive work style in the tasks requiring more incremental creativity through the means of targeted recruiting and selection process.

## **Study Limitations**

Despite the strengths and implications of the result, the present study is not without limitation. First, identifying exact cause-effect relationships among the study variables can be difficult with the use of cross-sectional data with a non-experimental design. Further, prior literature

on SHRM has argued that the effect of HR systems on performance are realized over time (e.g., AMO framework, Jiang et al., 2012a; Piening et al., 2013). Therefore, further studies should consider employing a longitudinal research design to offer robust empirical support for the hypotheses proposed in the present study.

Second, the measures of competitive and cooperative HR systems created in the present study did not consider the complicated relationships among each HR practice included in the measures of two distinct HR systems. Each of the HR measures in the present study was composed of several items that belong to representative HR policies under one of three HR policy domains (e.g., KSAs, motivation, and opportunities). Further, the score for each item was averaged across HR policies and, in turn, across HR policy domains to create one aggregated measure of each HR system following criteria of formative HR indices. However, an HR practice can interact with other practices within an HR system, resulting in positive or negative synergy (Jiang et al., 2012b). Furthermore, one HR system can be combined and interact with other HR systems with a different logic (e.g., implementing competitive and cooperative HR practices together in a focal organization), causing positive or negative synergy effect (Landkammer & Sassenberg, 2016; Sapegina & Weibel, 2017). These synergy effects would preclude measuring the actual effect of each HR system or practice on employees' creativity. Therefore, future studies should address whether and how an HR practice or system with certain characteristics interact with one another to capture the exact effect of certain HR system on performance,

such as creativity.

Third, the present study analyzed the effects of HR systems on the distinct creativity only at the individual level. However, the effect of competition or cooperation on performances could appear differently at the team or organizational level, as complicated team or organizational dynamics intervene (Swab & Johnson, 2019). For example, the aspects of competition and cooperation can be different between inter-team and intra-team relationships due to HR practices, and this difference can affect the individual or team creativity (e.g., HR practices facilitating intra-team cooperativeness and inter-team competitiveness together). Further, the effect of HR systems that encourage competition or cooperation among employees on creativity or innovation can be different between the individual and group level. Moreover, given that the workplace is saturated with multilevel hierarchical goal interdependencies (Swab & Johnson, 2019), it is imperative to consider a multilevel approach to capture the complicated effects of competitive or cooperative HR systems at diverse levels. Thus, further studies should be conducted by using a multilevel approach to discover the complex influence of competitive or cooperative HR systems on performances at the group or organizational levels.

## **VI. CONCLUSION**

In conclusion, the present study examines how employees' perceptions of competitive or cooperative HR system affects their exertion of radical and incremental creativity via their KMBs by developing a framework that reflects the multifaceted nature of HR systems, employees'

KMBs, and their creativity. The results of the present study demonstrate that employees' perceptions of different HR systems – competitive and cooperative HR systems – affect their radical creativity through different KMBs – knowledge expansion and sharing. Further, employees' distinct types of creativity – radical and incremental creativity – were exerted by the influence of these HR systems through their distinct KMBs depending on the degree of their intuitive work style. By revealing the effectiveness of these two HR systems on facilitating distinct individual creativity, this study provides a foundation for the further theoretical and empirical exploration of the unique roles of competitiveness and cooperativeness in HR systems on individual performances in field settings.

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## 요약 (국문초록)

# 인사관리 시스템이 지식관리 행위를 통해 직원들의 서로 다른 종류의 창의성에 미치는 영향

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이재욱

기존의 전략적 인사관리 연구들은 인사관리 시스템의 직원들 간 협동을 증진하는 역할을 강조해 왔으나, 인사관리 시스템의 경쟁적인 측면이 미치는 영향에 대해서는 크게 주목하지 않았다. 이와 관련하여, 해당 논문은 사회적 비교 이론, 사회적 상호 의존 이론, 그리고 사회적 교환 이론에 의거해 어떠한 방식으로 직원들의 인사관리 시스템에 대한 인식 – 인사관리 시스템이 경쟁을 증진시키는지, 혹은 협동을 증진시키는지에 대한 인식 – 이 그들의 지식 관리 행위를 통해 서로 다른 종류의 창의성을 발현에 영향을 미치는지를 알아보고자 하였다. 또한, 해당 논문은

직원들의 지식 관리 행위와 서로 다른 창의성 간 관계가 그들의 업무 상황에서의 인지적 성향에 의해 조절되는지를 밝히고자 하였다. 27 개 기업의 근로자 182 명과 팀장 65 명을 대상으로 실시한 설문 조사 결과, 직원들의 경쟁적 혹은 협동적 인사관리 시스템에 대한 인식은 각각 그들의 지식 확장 및 공유 행위와 유의한 정적 관계를 보였다. 또한, 지식 확장은 혁신적 창의성과 유의한 정적 관계를 보였으며 경쟁적 인사관리 시스템과 혁신적 창의성 간 관계를 매개하였다. 지식 공유와 개량적 창의성 간 관계는 유의하지 않았으나, 직원들이 높은 수준의 직관적 업무 방식을 보일 때 지식 공유는 개량적 창의성과 유의한 정적 관계를 보였다. 해당 논문은 서로 다른 성격을 가지는 인사관리 시스템에 대한 직원들의 인식이 다른 종류의 창의성에 영향을 미침을 밝힘으로써 전략적 인사관리 및 창의성에 대한 연구에 기여하고 있다.

**주요어:** 전략적 인사관리, 혁신적 창의성, 개량적 창의성, 지식 확장, 지식 공유, 인지 성향

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