

FROM EMPLOYEE-EXPERIENCED HIGH-INVOLVEMENT WORK SYSTEM TO INNOVATION: AN EMERGENCE-BASED HUMAN RESOURCE MANAGEMENT FRAMEWORK

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The influence of human resource management on innovation has attracted considerable research attention over the last decade. However, existing studies have primarily focused on the macro-level human resource management architecture, limiting our understanding about the cross-level origin of innovation. Developing an emergence-based human resource management framework, we propose that an employee-experienced high-involvement work system (HIWS) promotes innovation by eliciting collective interactions for knowledge exchange and aggregation. Further, we investigate the emergence-enabling process that facilitates an employee-experienced HIWS to give rise to organization-level innovation. Specifically, we probe three distinct emergence enablers that amplify the positive influence of HIWS on innovation by shaping the concertedness, direction, and adaptability of collective interactions: (1) the homogeneity of HIWS experiences as the internal mechanism, (2) the strategic importance of innovation as the external mechanism, and (3) the churn in human resources as the temporal mechanism. We tested our theoretical model using data from a nationally representative sample of workplaces in Canada ($n = 2,639$). Our results suggest that an employee-experienced HIWS was positively related to innovation. In addition, this positive effect was amplified by all three emergence enablers (i.e., the homogeneity of HIWS experiences, the strategic importance of innovation, and the churn in human resources).

We would like to thank our action editor Dr. Riki Takeuchi and the three anonymous reviewers for their constructive and insightful comments. We are also grateful to Dr. Cheri Ostroff for her helpful feedback on an earlier version of this article. Mo Wang's work on this research was supported in part by the Lanzillotti-McKethan Eminent Scholar Endowment. Research funding from the Social Sciences and Humanities Research Council of Canada supported Danielle D. van Jaarsveld and Dennis G. Ma.

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Considering the dynamic market environment and short product life cycles, "innovation"—defined as the intentional introduction and application of new ideas, processes, products, or procedures (West & Farr, 1990)—is crucially important in helping firms discover new market opportunities, adapt to environmental changes, and sustain competitive advantage. Yet, the management of innovation is challenging, because the knowledge creation process is discontinuous. In particular, although knowledge creation arises from the coalescence of human resources, this macro phenomenon cannot be reduced to its constituent elements (Kozlowski &

Klein, 2000). As such, articulating the process that enables the discontinuous emergence of knowledge creation contributes much to our understanding about the origin of innovation in organizations (Felin & Hesterly, 2007).

Despite the considerable research attention that strategic human resource management (HRM) scholars have devoted to examining the connection between HRM and innovation, existing research has primarily focused on the macro-level HRM architecture, investigating the influence of HRM systems on innovation-related activities, capability, and performance (e.g., Chang, Jia, Takeuchi, & Cai, 2014; Collins & Smith, 2006; Patel, Messersmith, & Lepak, 2013). While this macro focus informs organizations how to design HRM architecture to promote innovation, our understanding of the emergence process whereby human resources aggregate to generate innovation is still limited. As noted by Kozlowski and Klein (2000), there might be a danger of superficiality and triviality inherent in adopting a single-level perspective to account for organizational phenomena. Investigating the emergence process (i.e., the amplifying process whereby lower-level elements are aggregated to form higher-level phenomena; Kozlowski & Klein, 2000) linking the micro level to the macro level can engender a more integrated science of organizations. Thus, it is important for strategic HRM research to move beyond HRM architecture to uncover how organizations advance innovation by managing the emergence of human resources.

According to Ployhart and Moliterno (2011), organization-level human capital resources are created from the emergence of individuals' knowledge, skills, abilities, and other characteristics (KSAOs) via collective interactions (i.e., interpersonal exchange of information, affect, and resources; Kozlowski & Klein, 2000). Through this process, the KSAOs embedded in individual employees represent elemental raw materials, the collective interactions denote the amplifying process whereby raw materials are combined and aggregated, and the human capital resources embody the emergent macro reservoirs (Kozlowski & Klein, 2000). However, directly examining collective interactions, which is the key driver in the emergence process, is nearly impossible due to the sheer complexity of capturing dynamic social interactions (Colbert, 2004). Recognizing the missing ingredient connecting the micro and macro organizational research, Ployhart and Moliterno (2011) proposed a new theoretical account—the emergence-enabling process (i.e., the mechanisms through which individual-level

KSAOs are amplified to become organization-level human capital resources)—to explicate the features of collective interactions.

Building on the human capital resource emergence perspective (Ployhart & Moliterno, 2011), we propose an emergence-based HRM framework to investigate how employees' HRM experiences give rise to organization-level innovation. Specifically, we propose that employees' experiences with a high-involvement work system—that is, an employee-experienced high-involvement work system (HIWS)—can promote innovation, as HIWS-based collective interactions serve as the primary source for knowledge exchange and aggregation (Argote & Ingram, 2000). Further, drawing on the complex adaptive system (CAS) theory from complexity science (Colbert, 2004; Dooley, 2004), we propose three distinct emergence-enabling mechanisms that may amplify the positive influence of a HIWS on innovation by shaping the features of collective interactions (i.e., concertedness, direction, and adaptability). First, the internal mechanism reflects the internal implementation of HRM systems. It centers on the “concertedness” of collective interactions, which captures the extent to which HRM systems manage employees properly to facilitate implicit and explicit coordination in accomplishing work tasks. In this study, we consider the homogeneity of employees' HIWS experiences (i.e., employees' consensus regarding their general experiences of HIWSs) as an important enabler for a HIWS to induce concerted interactions. Second, the external mechanism examines an organization's strategic needs based on the business environment it encounters. It represents the “direction” of collective interactions, manifested as the strategic goals and values that organizations communicate to their employees. In this study, we use the strategic value that an organization attaches to innovation (i.e., the strategic importance of innovation) to probe the extent to which collective efforts are channeled toward innovation. Third, the temporal mechanism concerns the dynamics of human resources, including both its inflow (i.e., employees joining the organization; joiners) and outflow (i.e., employees leaving the organization; leavers). It evaluates the “adaptability” associated with collective interactions, manifested as the extent to which human resource flow reduces stagnation and increases responsiveness. We probe this temporal mechanism using the churn in human resources (i.e., the total quantitative flow of human resources into and out of the focal organization), which is a fundamental means for organizations to reshape

collective interactions for innovative changes in adapting to the dynamic environment.

Our study contributes to the existing literature in several ways. First, by closely examining three distinct types of emergence-enabling mechanisms that facilitate an employee-experienced HIWS to give rise to innovation, we contribute to the multilevel perspective of strategic HRM. As Jiang, Takeuchi, and Lepak (2013) suggested, the influence of HRM on organizational performance is fundamentally a multilevel phenomenon, because organization-level HRM systems impact organization-level outcomes by influencing individual-level employees' HRM experiences and reactions. Embracing this multilevel perspective, one recent trend in strategic HRM research is to adopt a top-down approach to investigate the cascading effects of HRM systems on individual attitudes and behaviors (e.g., Chang et al., 2014; Liao, Toya, Lepak, & Hong, 2009; Takeuchi, Chen, & Lepak, 2009). Far less research, however, has examined the bottom-up process whereby individuals' HRM experiences and reactions lead to organization-level outcomes. One exception is Nishii, Lepak, and Schneider (2008), who showed that employees' attributions regarding HRM practices had important consequences for their collective attitudes and behaviors, and, ultimately, unit performance. Another exception is Liu, Gong, Zhou, and Huang (2017), who demonstrated that employee-experienced HRM systems could influence employee creativity, which in turn promoted firm innovation. Building upon these ideas, we propose an emergence-based HRM framework to examine the emergence-enabling process that facilitates employees' HIWS experiences to give rise to innovation, complementing previous multilevel HRM research by providing a novel lens for evaluating the bottom-up HRM process.

Further, by establishing three enablers that correspond to the emergence-enabling mechanisms, we contribute to the contingency perspective of strategic HRM. To date, studies that investigated the connection between HRM and innovation mainly focused on universalistic predictions, implying that implementing "high road" HRM enhances innovation in an isomorphic manner across organizations (Colbert, 2004). Recognizing this research oversight, HRM researchers increasingly call for the investigation of contingent factors for the HRM-innovation relation to understand the boundary conditions under which organizations may benefit more from adopting "high road" HRM systems (e.g., Chang, Gong, Way, & Jia, 2013; Collins & Smith, 2006).

Answering this research call, our study investigates three emergence enablers that allow organizations to extract additional value from HRM in facilitating innovation, providing an effective integration of the multilevel HRM perspective with the contingency HRM perspective.

In addition, to explicate the emergence-enabling process linking HRM to innovation, we draw on the CAS theory in developing the taxonomy for the emergence-enabling mechanisms. Although the CAS theory was introduced to the organizational literature in theorizing organizational change (Dooley, 2004) and HRM architecture (Colbert, 2004), the features of the emergence process in the organizational system have received little research attention, limiting our understanding about the core premise of the CAS theory. By examining the internal, external, and temporal emergence-enabling mechanisms that facilitate employees' HRM experiences to give rise to innovation, the current study delineates patterns of collective interactions (i.e., concertedness, direction, and adaptability) that enrich the emergence process in the CAS theory.

THEORETICAL BACKGROUND

The emergence perspective focuses on the bottom-up process wherein the aggregate influence of lower-level elements leads to higher-level holistic phenomena (Kozlowski & Klein, 2000). The theoretical foundation of this perspective is rooted in complexity science, which combines general system theory with basic principles and characteristics of living systems (Dooley, 2004). The work organization can be categorized as one type of complex living system, in which individuals' affect, cognition, and behaviors unfold over time to yield collective phenomena (Kozlowski & Klein, 2000). Adopting this complexity lens, Colbert (2004) introduced the CAS theory from complexity science to the strategic HRM field to explain how and why HRM created sustainable competitive advantage by generating causal ambiguity and social complexity in human resources.

According to Colbert (2004), a CAS is characterized by two features: (1) a large number of interacting agents and (2) the presence of stable emergent patterns and properties. As basic elements of a CAS, "agents" are defined as semi-autonomous units (e.g., cells in a biological system or sellers in an economic system) that seek to optimize their fitness level by evolving over time (Dooley, 2004). In the organizational system, "agents" refer to individual

employees who interact with one another for the exchange of information and resources. The interactions of agents, in turn, give rise to emergent macro-level phenomena. The interactive dynamism is complex and unpredictable, because it arises from many linear and nonlinear interrelations among agents. Due to causal ambiguity and social complexity, inimitable competitive advantage is afforded by the emergence process (Colbert, 2004).

To uncover the inner workings of interactive dynamism in organizations, Ployhart and Moliterno (2011) proposed a new theoretical account—the emergence-enabling process—to describe the mechanisms through which lower-level KSAOs are aggregated and transformed into valuable organization-level human capital resources. Importantly, through repeated interactions among organizational members, emergence-enabling states (i.e., emergent cognitive states, emergent behavioral processes, and emergent affective states) arise and gradually regularize, crystallize, and stabilize to guide subsequent collective interactions (Ployhart & Moliterno, 2011). Despite its valuable insight, the human capital resource emergence perspective offers us little guidance about how organizations can effectively manage the emergence process of human resources. Thus, Ployhart and Moliterno (2011) underscored the importance of future studies to investigate the role of HRM in facilitating human capital resource emergence.

Answering the research call sounded by Ployhart and Moliterno (2011), we propose an emergence-based HRM framework to study the linkage between the employee-experienced HIWS and organization-level innovation. According to strategic HRM researchers, a HIWS includes a set of management practices implemented to create opportunities for collective interactions through increasing employees' discretion, coordination, and collaboration (Batt & Colvin, 2011; Lawler, 1986, 1992). Thus, employees' experiences with the HIWS play a central role in eliciting collective interactions in the organizational system. Further, applying an agent-centered approach specified by the CAS theory, we derive three emergence-enabling mechanisms that may amplify the effect of a HIWS on innovation by shaping the features of collective interactions (i.e., concertedness, direction, and adaptability) among employees (i.e., agents in the organizational system).

Specifically, the internal mechanism focuses on agent concertedness and examines how the internal

implementation of HRM systems in an organization facilitates interconnected employees to exhibit concerted actions in pursuing collective goals. We consider the homogeneity of employees' HIWS experiences to be an important enabler for a HIWS to induce concerted interactions. According to Nishii et al. (2008), meaningful variability exists within organizations in terms of employees' experiences with and reactions to HRM systems. Nishii and Wright (2008) further pointed out that variability in employees' HRM experiences should be captured when examining the relation between HRM and organizational performance, because such variability might operate as an important boundary condition for the HRM-performance linkage. Consistent with previous studies, we consider the homogeneity of employees' HIWS experiences as a contingent factor that shapes the relation between HIWS and innovation. In particular, we propose that homogeneous experiences amplify the positive effect of HIWS on innovation by facilitating the concertedness of collective interactions via developing implicit coordination, explicit coordination, and emotional "bonds" for the collective.

The external mechanism focuses on agent direction, which depends on the business environment-based strategic needs that organizations communicate to employees. As organizations vary in terms of strategic values and goals, their HRM systems are deployed to elicit different employee behaviors in support of corresponding business strategies (Delery & Doty, 1996; Wright & Snell, 1998). For organizations seeking to achieve innovation, employees' synergistic efforts need to be directed toward knowledge creation. To elicit relevant employee behaviors, organizations ought to clearly express to employees their strategic need and priority regarding innovation. In this study, we use the strategic importance that an organization attaches to innovation to probe the extent to which collective efforts are channeled toward innovation. This conceptualization is appropriate, because, when an organization places higher importance on innovation, employees are more likely to engage in innovation-related activities (e.g., knowledge generation, knowledge exchange, and knowledge aggregation), as these activities are more likely to be recognized and rewarded by the organization (Tsui, Pearce, Porter, & Tripoli, 1997).

The temporal mechanism focuses on agent adaptability. We consider the churn in human resources as a fundamental organizational dynamism that reshapes collective interaction patterns in adapting to

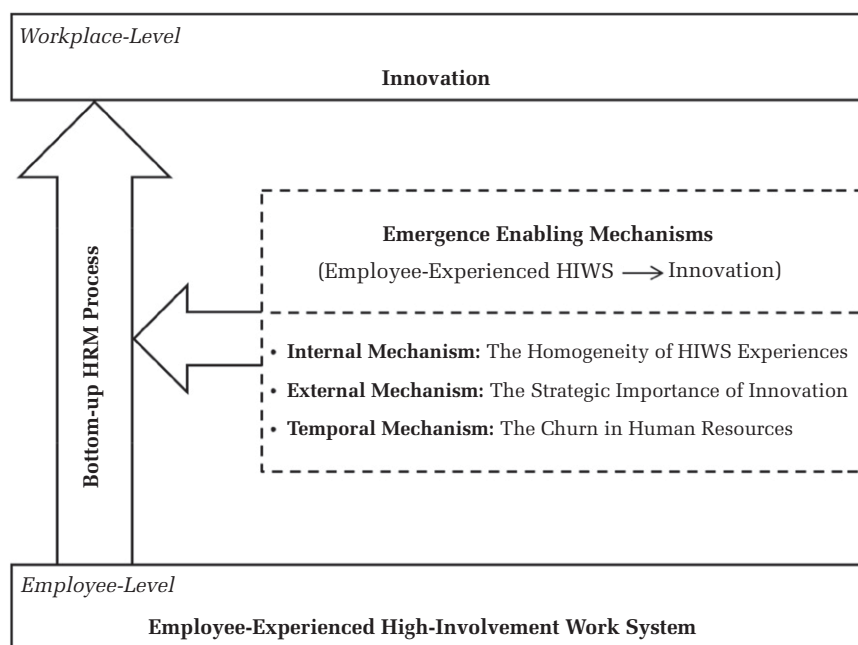
the unstable and turbulent competitive environment. This construct focuses on the quantity of human resource flow regardless of the quality, which is aligned with the labor economics literature viewing employee mobility as reallocation or churning of labor in the labor market (e.g., Burgess, Lane, & Stevens, 2000; Franco & Filson, 2006). Indeed, the CAS theory suggests that the churn in human resources is associated with changes in schema (i.e., mental templates that define how reality is interpreted and what appropriate responses are for a given stimulus; Holland, 1995), information and resource flow, and agent connectivity in the organizational social networks (Dooley, 2004). As such, the churn in human resources serves as the basic means for organizations to shift the patterns of collective interactions. In this study, we submit that the churn in human resources can facilitate HIWS to give rise to innovation by shaping the nature of human capital resources that HIWS leverages. We base our logic on the fact that functional human resource flow can refresh the human resource pool with updated KSAOs and reduce the stagnation of collective interactions (Hannan & Freeman, 1984). Consequently, innovation is more likely to happen when HIWS leverages churning human resources. We present our theoretical model in Figure 1.

HYPOTHESES DEVELOPMENT

An Employee-Experienced HIWS and Innovation

In contrast to Taylorized work design emphasizing narrow job specifications and constricted work autonomy, the high-involvement approach to work design combines employee discretion with group problem-solving, assuming that employees need discretion to solve problems with problem-solving best achieved through collaboration (Batt & Colvin, 2011). Correspondingly, a HIWS refers to a set of HRM practices that are designed to promote employee empowerment, collective collaboration, and relational coordination (Lawler, 1986, 1992). Typical high-involvement work practices include team-based design (e.g., problem-solving teams and self-directed teams), information sharing (e.g., employee suggestion program), aggregate compensation strategy (e.g., gainsharing), flexible job design (e.g., job rotation), and employee training (von Bonsdorff, Zhou, Wang, Vanhala, von Bonsdorff, & Rantanen, 2016; Zatzick & Iverson, 2006). Importantly, in this study, we focus on employees' actual HIWS experiences rather than managerial reports of a HIWS. Stated by Jiang et al. (2013), HRM systems designed at the organizational level needed to be experienced by individual employees to exert an

FIGURE 1
An Emergence-Based HRM Framework for Innovation



actual impact on the organization. Similarly, Wright and Nishii (2013) argued that HRM practices must be perceived and interpreted subjectively by individuals to elicit their affective, cognitive, and behavioral reactions. As we investigate how a HIWS and its associated emergence-enabling mechanisms facilitate the aggregation of human resources for innovation, focusing on an employee-experienced HIWS aligns more closely with the current research goal.

We propose that an employee-experienced HIWS promotes innovation by eliciting collective interactions. First, team-based high-involvement activities provide employees with the opportunity to collaborate with other team members in problemistic search (i.e., the type of search that is stimulated by a problem and aimed at finding a solution for that problem), a fundamental mechanism that generates innovation (Greve, 2003). Through frequent collaboration in problem-solving, team members are able to develop relational coordination for group learning and creativity (Gittell, Seidner, & Wimbush, 2010). Second, employees' participation in information sharing, training, and job rotation can help them accumulate a sufficient level of knowledge overlap for effective communication and increase knowledge exchange between individuals with diverse repertoires of local knowledge (Collins & Smith, 2006). As such, efficient knowledge aggregation is more likely to take place. Third, employee discretion and gainsharing contribute to innovation by reducing the stickiness in knowledge transfer (i.e., the difficulty experienced in the knowledge transfer process; Szulanski, 2000). Specifically, increasing employee discretion can release employees from the confines of narrow job specifications and enable them to capitalize on their tacit knowledge for knowledge generation and knowledge exchange, in turn facilitating the knowledge transfer process. Further, adopting gainsharing practices can align individual and organizational objectives to cope with agency problems (Gomez-Mejia & Balkin, 1989). In pursuing common goals that move beyond individual goal optimization, employees are more motivated to exchange their knowledge to improve the overall work process and are more likely to develop mutual trust and psychological safety through the knowledge transfer process (Gong, Cheung, Wang, & Huang, 2012).

Hypothesis 1. An employee-experienced HIWS is positively related to innovation.

The Internal Mechanism: The Homogeneity of HIWS Experiences

According to Ployhart and Moliterno (2011), three emergent enabling states are the determinants of concerted collective actions: (1) emergent cognitive states, (2) emergent behavioral processes, and (3) emergent affective states. Accordingly, we expect the homogeneity of employees' HIWS experiences to amplify the positive influence of an employee-experienced HIWS on innovation by influencing these three emergent states, respectively. First, when employees' HIWS experiences are homogeneously high, they cultivate concerted emergent cognitive states for knowledge aggregation. Specifically, when employees are uniformly exposed to a HIWS, they are more likely to hold overlapping cognitive representations of work tasks and develop shared understandings regarding organizations' expectations (Bowen & Ostroff, 2004). Such shared perceptions, in turn, facilitate the formation of shared mental models and promote the synchronization, pacing, and quality of organizational processes, thus improving the effectiveness of knowledge exchange and aggregation. Further, homogeneous HIWS experiences benefit organizational learning by developing a high-quality transactive memory system for the organization (i.e., a shared organizational system for encoding, storing, and retrieving information; Wegner, 1986). In particular, they promote or generate broad and intensive interconnections among employees, and in turn facilitate the development of organization-level knowledge architecture with a specialized division of labor from different knowledge expertise, reducing individuals' cognitive load and providing organizations with full access to a large reservoir of knowledge (Argote & Ingram, 2000).

Second, when employees' HIWS experiences are homogeneously high, they cultivate concerted emergent behavioral processes for knowledge exchange. The collective behavioral processes of an organization are manifested as employees' overt communication and explicit coordination in the work process (Ployhart & Moliterno, 2011). When employees are uniformly exposed to a HIWS, they are more likely to be involved in the communication and coordination process in accomplishing interdependent work tasks. Through the communication process, involved employees can exchange task-relevant information and knowledge, which are important sources of innovation (Argote & Ingram, 2000). In addition, through explicit coordinating

activities, involved employees are able to aggregate their discretionary behaviors toward the formation of a unified workforce, removing the barriers for the creation and implementation of creative ideas.

Third, when employees' HIWS experiences are homogeneously high, they cultivate concerted emergent affective states for knowledge transfer. The collective affective states of an organization largely depend on the strength of emotional "bonds" that tie its members together (Ployhart & Moliterno, 2011). Homogeneous HIWS experiences can strengthen the emotional "bonds" by cultivating social capital in the workforce (Tsai & Ghoshal, 1998). In particular, through HIWS-based interactions, employees can develop mutual understanding regarding one another's expectations, needs, and goals, and adjust their communication and behavioral patterns accordingly to fit the social situation. Over time, such unfolding social interactions can help the workforce develop collective trust and cohesion, facilitating knowledge exchange and aggregation (Jones & George, 1998).

Hypothesis 2. The homogeneity of HIWS experiences moderates the relation between an employee-experienced HIWS and innovation, such that this positive relation is more (vs. less) pronounced when HIWS experiences are more (vs. less) homogeneous.

The External Mechanism: The Strategic Importance of Innovation

The contribution of HRM practices to organizational performance is contingent on the extent to which they align with the business strategy (Becker & Gerhart, 1996; Wright & Snell, 1998). To achieve innovation, organizations ought to clearly communicate to the employees their strategic need for innovation to direct collective efforts toward innovation. As such, we expect the strategic importance that organizations attach to innovation to amplify the positive influence of a HIWS on innovation. In particular, we argue that the amplifying effect of the strategic importance of innovation can be explained by the complementarity between employees' HRM experiences and organizations' strategic needs. On the one hand, if organizations value innovation, an employee-experienced HIWS can better elicit organization-desired collective behaviors that satisfy the strategic need for innovation (Delery & Doty, 1996). This line of logic is based on the idea that, when innovation is important to organizations, organizations are more likely to recognize

and reward employee behaviors that benefit innovation through HRM (Tsui et al., 1997). As such, emergent human capital resources garnered by a HIWS are more likely to be channeled toward knowledge creation. On the other hand, organizations emphasizing the strategic importance of innovation may facilitate collective efforts directed toward innovation to materialize as new products or processes by providing a beneficial context for knowledge creation. Specifically, organizations that value innovation tend to be learning oriented, encouraging divergent thinking and knowledge exchange. Thus, employees are more motivated to criticize existing routines, challenge one another's opinions, and express their novel insights. As such, high-involvement work practices are more likely to result in innovative ideas when the strategic importance of innovation is higher. Further, organizations that emphasize the strategic value of innovation are more tolerant of errors and may even encourage employees to learn through a trial-and-error process (Levitt & March, 1988). Therefore, when employees are involved in problem-solving, they are less guarded about new ideas and are more willing to develop potential solutions progressively through multiple trial-and-error learning processes.

Hypothesis 3. The strategic importance of innovation moderates the relation between an employee-experienced HIWS and innovation, such that this positive relation is more (vs. less) pronounced when the strategic importance of innovation is high (vs. low).

The Temporal Mechanism: The Churn in Human Resources

As mentioned above, a HIWS benefits innovation by eliciting collective interactions for knowledge exchange and knowledge aggregation. As such, the extent to which a HIWS contributes to innovation largely depends on the nature of human capital resources that a HIWS leverages. In particular, to create new knowledge, a HIWS needs to leverage a human resource pool that contains updated knowledge and presents low rigidity to changes. Following this logic, we expect the churn in human resources to amplify the positive effect of a HIWS on innovation for three reasons. First, the churn in human resources facilitates a HIWS to generate innovation by continuously updating organizations' knowledge reservoir, with employee mobility serving as a powerful mechanism for tacit and explicit knowledge transfer across organizations. According to prior studies,

labor mobility can facilitate innovation through the learning-by-hiring effect (i.e., knowledge accumulation through new employees due to knowledge diffusion; Song, Almeida, & Wu, 2003) and the social network effect (i.e., departing employees remain in contact with former colleagues for knowledge exchange; Shipilov, Godart, & Clement, 2017). Consequently, a churning labor force can update the knowledge reservoir by infusing new knowledge, reducing information redundancy, and expanding the knowledge network. Owing to the increased variety of perspectives associated with the quickly updated knowledge reservoir, the effect of a HIWS on innovation may be strengthened.

Second, the churn in human resources also reduces organizational stagnation, an obstacle that impedes a HIWS from generating innovation. Specifically, stable and long-term employment tends to develop a shared schema that locks organizational members into the existing interest, culture, and relations embedded in the organization (Hannan & Freeman, 1984). Consequently, organizations with stagnant human resources tend to rely heavily on established routines and are less open to novel solutions (Sørensen & Stuart, 2000). As such, the churn in human resources can be viewed as a revitalizing process that increases the flexibility and adaptability of collective interactions (Shaw, 2011). Through the inflow and outflow of human resources, the workforce may reshape its collective interaction patterns and discover creative ways for resource deployment, facilitating a HIWS to promote innovation.

Third, the churn in human resources can improve organizations' receptivity to creative solutions that are distant from or incompatible with the current routines. This is because the human resource flow can mitigate the tendency of local search, reduce the escalation of commitment in ongoing routines, and improve organizational openness to divergent solutions (Rietzschel, Zacher, & Stroebe, 2016; Staw, 1981). Furthermore, the churn in human resources can reduce the formation of "groupthink" (Schneider, Goldstein, & Smith, 1995). As such, churning organizations are less narrow-minded or constricted in evaluating, processing, and absorbing knowledge and information. Therefore, innovative changes are more likely to happen when a HIWS leverages churning human resources.

Hypothesis 4. The churn in human resources moderates the relation between an employee-experienced HIWS and innovation, such that this positive relation is more (vs. less) pronounced when the churn in human resources is high (vs. low).

METHOD

Sample

We tested our hypotheses with the Workplace and Employee Survey (WES) data collected by Statistics Canada (Statistics Canada, 2009). The workplaces are akin to "establishments," which refer to stand-alone entities with a business address (Takeuchi et al., 2009). The advantage of surveying establishments over firms is that multiple establishments of the same firm may pursue distinct business strategies and adopt different HRM systems. In addition, respondents in an establishment are more likely to accurately assess the specific situations within the unit (Batt & Colvin, 2011). The WES consists of two parts: the Workplace Survey and the Employee Survey. This unique dataset links employees to workplaces, enabling us to study the effect of employee-experienced HRM on workplace outcomes. Different sampling frames were used in the two parts of the WES. For the Workplace Survey, Statistics Canada used stratified random sampling by industry, region, and size to build a representative sample of workplaces in Canada. The sampled locations were followed over time, with new locations added every two years to replace those that ceased to participate due to attrition. The primary respondent for the Workplace Survey was a workplace HR manager, except in small locations, where a general manager or business owner completed the survey. For the Employee Survey, Statistics Canada sampled participants from the surveyed workplaces and followed them for two years. Thus, fresh samples of employees were drawn every other year. A maximum of 12 employees were sampled at each workplace using a probability mechanism. Previous HRM researchers have published several studies using the WES data set (e.g., Shin & Konrad, 2017; Yanadori & van Jaarsveld, 2014; Zatzick & Iverson, 2006).

From the multi-wave WES data set (1999–2006), we selected the 2005–2006 waves to test our hypotheses, because the 2005–2006 waves included the most recent and complete set of variables used in the study and had the largest sample size across all the surveyed years. Specifically, the independent variables and control variables were measured in 2005 and the dependent variable (i.e., innovation) was measured in 2006. In organizing the data for the current analyses, we excluded employees who did not provide answers to questions about HRM practices (16.28%). Further, guided by Yanadori and van Jaarsveld (2014), we excluded Employee Survey responses from managerial employees (10.48%), because our research focuses on leveraging human resources of frontline employees. In addition, we excluded workplaces with fewer than three

employee reports (5.37%), to obtain a more robust assessment of the within-workplace homogeneity in employees' HIWS experiences. Finally, we excluded non-profit workplaces (14.01%), because our study focuses on for-profit organizations. Applying the above exclusion criteria, our research sample included 2,753 workplaces and 13,032 employees. After deleting observations with missing values in variables of interest, our final sample consisted of 2,639 workplaces and 12,519 employees. The mean workplace size was approximately 49 employees ($SD = 100.09$) and the average length that workplaces had been located at their current address was 19.32 years ($SD = 17.56$).

Measures

Innovation (Workplace Survey in 2006). To measure innovation, previous studies have adopted various approaches, including measuring innovation activities (e.g., patents; Sørensen & Stuart, 2000), innovation capability (e.g., Patel et al., 2013), and innovation launches (e.g., Greve, 2003). We used two items from the Workplace Survey to measure innovation launches: (1) product innovation—the workplace has introduced new products or services that differ significantly from previously produced goods or services; and (2) process innovation—the workplace has introduced new processes, including the adoption of new methods of goods production or service delivery. Specifically, we coded workplaces that reported no product or process innovation as 0, workplaces that reported either product or process innovation as 1, and workplaces that reported both product and process innovation as 2.^{1,2}

¹ Alternatively, innovation could be coded as a dichotomous measure (0 = no product or process innovation, 1 = had product or/and process innovation). We conducted a robustness check with this dichotomous innovation measure using probit regression. The result pattern was virtually the same as the one reported here.

² Our emergence-based HRM framework cannot sufficiently differentiate the influence of HRM on product innovation and process innovation, as the mechanisms we propose are not specific to different types of knowledge creation (i.e., product vs. process). Therefore, in this study, we adopted a general innovation measure combining product innovation and process innovation to capture organizations' knowledge creation. We conducted a robustness check by treating product innovation and process innovation as two separate outcomes using probit regressions. The result patterns of both product and process innovation were virtually the same as the one reported here.

An employee-experienced HIWS (Employee Survey in 2005). Following Zatzick and Iverson (2006), we measured a HIWS with six HRM practices that are commonly used by organizations to involve employees: flexible job design, information sharing, problem-solving teams, self-directed teams, gain-sharing, and training (1 = yes, 0 = no). According to Zatzick and Iverson (2006), the six HRM practices were observed indicators that reflected the high-involvement approach to work design. However, in contrast to Zatzick and Iverson (2006), who used the Workplace Survey reported by managers to measure HIWSs, we used the Employee Survey reported by employees to evaluate employees' experiences with a HIWS. To assess the construct validity of our measure, we performed a categorical indicator-based confirmatory factor analysis. The one-factor model resulted in a good fit to the data, $\chi^2 = 210.38$, $df = 9$, $p < .01$, comparative fit index = .97, Tucker–Lewis index = .95, and root mean square error of approximation = .04. Cronbach's alpha for the scale was .71, indicating that this is an acceptable measure. We calculated the employee-experienced HIWS for each workplace (\bar{X}) by aggregating employees' ratings of their individual HIWS experiences to the workplace level, using the formula listed below. In support of aggregation, $r_{WG(j)}$ was calculated for each workplace. The mean $r_{WG(j)}$ across workplaces was .57, indicating that the majority of workplaces displayed moderate to high within-workplace agreement in HIWS ratings (LeBreton & Senter, 2008). Further support for aggregating employee responses to a HIWS to the workplace level was provided by the interrater correlation coefficients: ICC(1) = .24, ICC(2) = .61. The one-way random-effect analysis of variance showed that there were significant variances in the workplace-level means of HIWS ratings, $F(2,752, 10,279) = 2.53$, $p < .01$.

$$\bar{X} = \frac{\sum_{i=1}^N X_i}{N}, \quad X_i = \frac{\sum_{j=1}^6 X_{ij}}{6} \quad (1)$$

where i is the i th employee, j is the j th item, and N is the number of employee reports.

The homogeneity of HIWS experiences (Employee Survey in 2005). The homogeneity of employees' HIWS experiences captures the extent to which employees present low variability in their HIWS experiences in the focal workplace. This measure was derived from employee responses to a HIWS using a dispersion model, a type of composition model that specifies the functional relationships among constructs at different levels of analysis

in multilevel research (Chan, 1998). In accordance with previous researchers, homogeneity can be assessed by either standard deviation or $r_{WG(j)}$ statistics (Harrison & Klein, 2007; James, Demaree, & Wolf, 1993). Accordingly, we used both standard deviation and $r_{WG(j)}$ to measure the homogeneity of HIWS experiences. When standard deviation was used, to represent homogeneity and facilitate interpretation of our findings, we followed Koopmann, Lanaj, Wang, Zhou, and Shi (2016) by multiplying the standard deviation by -1 so that higher values represent higher levels of homogeneity. Our results were virtually the same for the two measures. Due to space constraints, we only present our findings using the first measure. It is noteworthy that, as our homogeneity measure was derived from employee responses to a HIWS, the range of homogeneity was restricted by that of an employee-experienced HIWS. As explained by Harrison and Klein (2007: 1214):

... because the *SD* of a within-unit distribution is often lower when the mean is near the lower or upper bound ... there may be an artifactual overlap of means and *SDs* across units. In short, mean and *SD* can be confounded.

Therefore, guided by Harrison and Klein (2007), we modeled the employee-experienced HIWS and the homogeneity of HIWS experiences simultaneously to address this range restriction issue.

The strategic importance of innovation (Workplace Survey in 2005). We measured the strategic importance of innovation with three items that reflect the importance of innovation to the workplace business strategy. Specifically, in the Workplace Survey, managers rated the importance (from 1, *of no importance*, to 6, *crucial*) of the following innovative activities to the general business strategy of their workplaces: (1) undertaking research and development, (2) developing new products/services, and (3) developing new production/operating techniques. Cronbach's alpha was .81 for this scale.

The churn in human resources (Workplace Survey in 2005). According to the labor economics literature (e.g., Burgess et al., 2000; Burgess, Lane, & Stevens, 2001), two groups of employees constitute the churning labor force for a focal workplace (w) at a specific year (t): joiners (i.e., workers who were not employed at the workplace w at time $t - 1$ and joined at time t) and leavers (i.e., workers who were employed at the workplace w at time $t - 1$ and left at time t). Therefore, we measured the churn in human resources using the total number of joiners and leavers scaled by the total number of employees in

the workplace. Our measure corresponds closely with the definition of the churn in human resources, which captures the aggregate level of human resources that flow into and out of an organization. It is important to note that the churn in human resources is an emergent collective construct describing the total quantitative flow of human resources. As such, this measure captures periodic changes in human resources, a type of resource stock that organizations need to manage across times (Barney & Wright, 1998).

Control variables (Workplace Survey in 2005). Based on previous HRM studies (e.g., Guthrie, 2001; Zatzick & Iverson 2006), we controlled for numerous workplace-level variables. Specifically, we controlled for workplace age (i.e., the length of years for which the workplace had been located at the current location), because workplaces that are able to endure may have a higher level of management quality (Guthrie, 2001). We controlled for workplace size (i.e., the total number of employees in the workplace) and profitability (i.e., workplace profit scaled by the total number of employees), because organizations with a larger operating scale and higher profitability are more likely to possess slack resources and managerial capability to implement a HIWS and launch innovation (Shin & Konrad, 2017). In addition, we controlled for union density (i.e., the proportion of employees covered by a collective agreement), because workplaces with a higher degree of unionization may provide employees with more opportunities for involvement in the management process (Guthrie, 2001). Finally, following previous research (e.g., van Dalen, Henkens, & Wang, 2015; Zatzick & Iverson, 2006), we controlled for dichotomous industry sectors, to tease out establishment-level effects from potential industry-level effects.³

Analytical Strategy

Because the dependent variable—innovation—is ordinal, we conducted ordered probit regressions.

³ There were 14 dichotomous industry sectors: forestry, mining, oil and gas extraction; labor intensive tertiary manufacturing; primary product manufacturing; secondary product manufacturing; capital intensive tertiary manufacturing; construction; transportation, warehousing and wholesale; communication and other utilities; retail trade and consumer services; finance and insurance; real estate, rental and leasing operations; business services; education and health services; and information and cultural industries.

To test the moderating effects (Hypotheses 2–4), three-step hierarchical regressions were used. In Step 1, only the control variables were entered into the regression model. In Step 2, we entered the control variables, the employee-experienced HIWS, and the three emergence enablers to gauge the main effects of independent variables. In Step 3, we entered the variables in Step 2 and the interaction terms to test the hypothesized moderating effects. For ease of interpretation, the control variables and independent variables were grand mean-centered. The interaction terms were the products of grand mean-centered independent variables. In estimating these models, we used the workplace survey weights provided by Statistics Canada for the representativeness of sample estimates. We used *Mplus* 7.11 to conduct analyses (Muthén & Muthén, 1998-2012).⁴

RESULTS

Table 1 presents the descriptive statistics and correlations of our studied variables. Table 2 presents the results of ordered probit regression models for innovation. Together, employee-experienced HIWS, the homogeneity of HIWS experiences, the strategic importance of innovation, and the churn in human resources accounted for 10.8% variance in predicting innovation above and beyond the control variables.

As shown in Model 2 (Table 2), HIWS was positively and significantly related to innovation, $b = 1.55$, $p < .01$. For employee-experienced HIWS, a one standard deviation increase from its mean resulted in a 2.2-percentage-point increase in the probability of having either product or process innovation and a 7.5-percentage-point increase in the probability of having both product and process innovation, supporting Hypothesis 1.

Further, the strategic importance of innovation was positively and significantly related to innovation, $b = .20$, $p < .01$. For the strategic importance of innovation, a one standard deviation increase from its mean resulted in a 2.4-percentage-point increase in the probability of having either product or process innovation and an 8.5-percentage-point increase in the probability of having both product and process innovation, demonstrating that workplaces were more likely to innovate when their strategic importance of innovation was higher. In addition, the

churn in human resources was also positively and significantly related to innovation, $b = .06$, $p < .01$. A one standard deviation increase from its mean resulted in a 0.8-percentage-point increase in the probability of having either product or process innovation and a 2.1-percentage-point increase in the probability of having both product and process innovation.

Model 3 presents the results for the hypothesized moderating effects. In Model 3.1 (Table 2), the three hypothesized interaction terms were entered into the regression models. In Model 3.2 (Table 2), we controlled for the three interaction terms among the moderators so that all six interaction terms were entered into the regression model simultaneously. Our main findings were virtually the same for the two models. For the purpose of brevity, the results we discuss focus on Model 3.2.

In Hypothesis 2, we expected that, when the homogeneity of HIWS experiences was higher, the positive relationship between employee-experienced HIWS and innovation would be stronger. As shown in Model 3.2, the interaction between employee-experienced HIWS and the homogeneity of HIWS experience was positive and significant, $b = 7.95$, $p < .01$. To further examine this moderating effect, we plotted the interaction pattern in Figure 2. As shown in this figure, when the homogeneity of HIWS experience was higher, the positive effect of HIWS on the probability of innovation was stronger, providing support for Hypothesis 2.⁵

In Hypothesis 3, we hypothesized that the positive relationship between employee-experienced HIWS and innovation would be stronger when workplaces placed more emphasis on the strategic importance of innovation. According to Model 3.2, the interaction term between HIWS and the strategic importance of innovation was positive and significant, $b = .45$, $p < .01$. Further, as shown in Figure 3, when the strategic importance of innovation was higher, the positive effect of HIWS on the probability of having both product and process innovation was stronger. Therefore, we found general support for Hypothesis 3.

In Hypothesis 4, we expected the churn in human resources to strengthen the positive relation between employee-experienced HIWS and innovation. According to Model 3.2, the interaction term between

⁴ We conducted a sensitivity analysis by controlling for the innovation baseline (2005) during the analysis. The results were similar to the ones reported here.

⁵ Following Hoetker (2007), we also examined Hypotheses 2–4 by plotting the marginal effects of the interactions. The results were consistent with the ones reported here. For the purpose of brevity, we only present cumulative probabilities in the figures.

TABLE 1
Means, Standard Deviations, and Correlations for Studied Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Workplace age	19.32	17.56													
2 Workplace size ^a	3.43	0.80	.05												
3 Multi-plant firm	0.27	0.44	.08	.27											
4 Profitability ^a	7.08	6.23	.09	-.03	.01										
5 Union density	0.13	0.29	.19	.28	.20	.02									
6 Percentage of male employees	0.54	0.29	-.03	.13	.07	.00	.14								
7 Percentage of full-time employees	0.76	0.26	-.03	.02	-.02	.02	-.02	.53							
8 Percentage of on-site employees	0.90	0.24	.07	.01	.10	.00	-.03	-.32	-.16						
9 Average employee wage ^a	10.31	0.66	.03	.04	.08	.11	.04	.44	.73	-.14					
10 Employee-experienced HIWS	0.45	0.16	-.07	.08	.17	.03	-.10	.02	.20	-.01	.29				
11 The homogeneity of HIWS experiences	-0.20	0.10	.01	-.08	-.04	-.07	-.01	-.16	-.05	.01	-.09	-.09			
12 The strategic importance of innovation	2.93	1.39	-.03	.16	.02	-.03	.01	.11	.20	.07	.09	.15	.00		
13 The churn in human resources	0.60	1.23	.02	.03	-.05	-.02	-.04	.02	-.05	-.01	-.04	-.01	-.11	.02	
14 Innovation	0.64	0.83	-.09	.15	.14	-.04	-.05	-.10	-.04	.13	-.05	.22	-.01	.26	.05

Notes: $n = 2,639$. We present weighted descriptive statistics. Dichotomous industry sectors are not listed in the table (for brevity).

^a A logarithm function was used to scale this variable.

TABLE 2
Ordered Probit Regression Models for Innovation (2006)

Predictors (2005)	Model 1		Model 2		Model 3.1		Model 3.2	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
<i>Control variables</i>								
Workplace age	-0.01**	.00	-0.01**	.00	-0.01**	.00	-0.01**	.00
Workplace size	0.26**	.10	0.20*	.10	0.20*	.10	0.20*	.10
Multi-plant firm	0.29	.18	0.28	.18	0.28	.17	0.28	.16
Profitability	-0.004**	.00	-0.01**	.00	-0.01**	.00	-0.01**	.00
Union density	-0.28	.33	-0.20	.32	-0.20	.32	-0.20	.32
Percentage of male employees	-0.63	.39	-0.61	.34	-0.59	.32	-0.58	.30
Percentage of full-time employees	0.32*	.13	0.11	.24	0.08	.20	0.06	.20
Percentage of on-site employees	0.59**	.16	0.57**	.12	0.58**	.11	0.57**	.11
Average employee wage	-0.10**	.04	-0.19**	.04	-0.22**	.03	-0.22**	.03
<i>Main effects</i>								
Employee-experienced HIWS (HIWS)			1.55**	.07	1.45**	.07	1.45**	.07
The homogeneity of HIWS experiences (Internal)			-0.17	.14	-0.36*	.16	-0.35*	.14
The strategic importance of innovation (External)			0.20**	.04	0.18**	.04	0.18**	.04
The churn in human resources (Temporal)			0.06**	.01	0.01	.01	0.02	.01
<i>Interaction terms</i>								
Internal × External							-0.30	.17
Internal × Temporal							-0.17*	.08
External × Temporal							-0.02	.03
HIWS × Internal					7.68**	.73	7.95**	.69
HIWS × External					0.47**	.06	0.45**	.07
HIWS × Temporal					0.55**	.12	0.57**	.19
<i>Intercepts</i>								
Intercept 1	-0.26**	.01	-0.27**	.01	-0.27**	.01	-0.27**	.01
Intercept 2	-0.81**	.04	-0.86**	.04	-0.87**	.04	-0.87**	.04
R^2	15.7%		26.5%		27.8%		28.0%	

Notes: $n = 2,639$. Unstandardized regression coefficients are reported. The workplace survey weights were used during the analyses. R^2 was calculated using the continuous latent response variable approach (Snijders & Bosker, 2012), which is better than model fit-based pseudo R^2 (e.g., Cox–Snell R^2 and McFadden R^2) in terms of indicating the effect sizes of the prediction in ordered probit regression. Dichotomous industry sectors were controlled, but are not listed in the table (for brevity).

* $p < .05$

** $p < .01$

HIWS and the churn in human resources was positive and significant, $b = .57$, $p < .01$. The interaction plot is presented in Figure 4. As shown, when the churn in human resources was higher, the positive effect of HIWS on the probability of innovation was stronger. Thus, Hypothesis 4 was also supported.

DISCUSSION

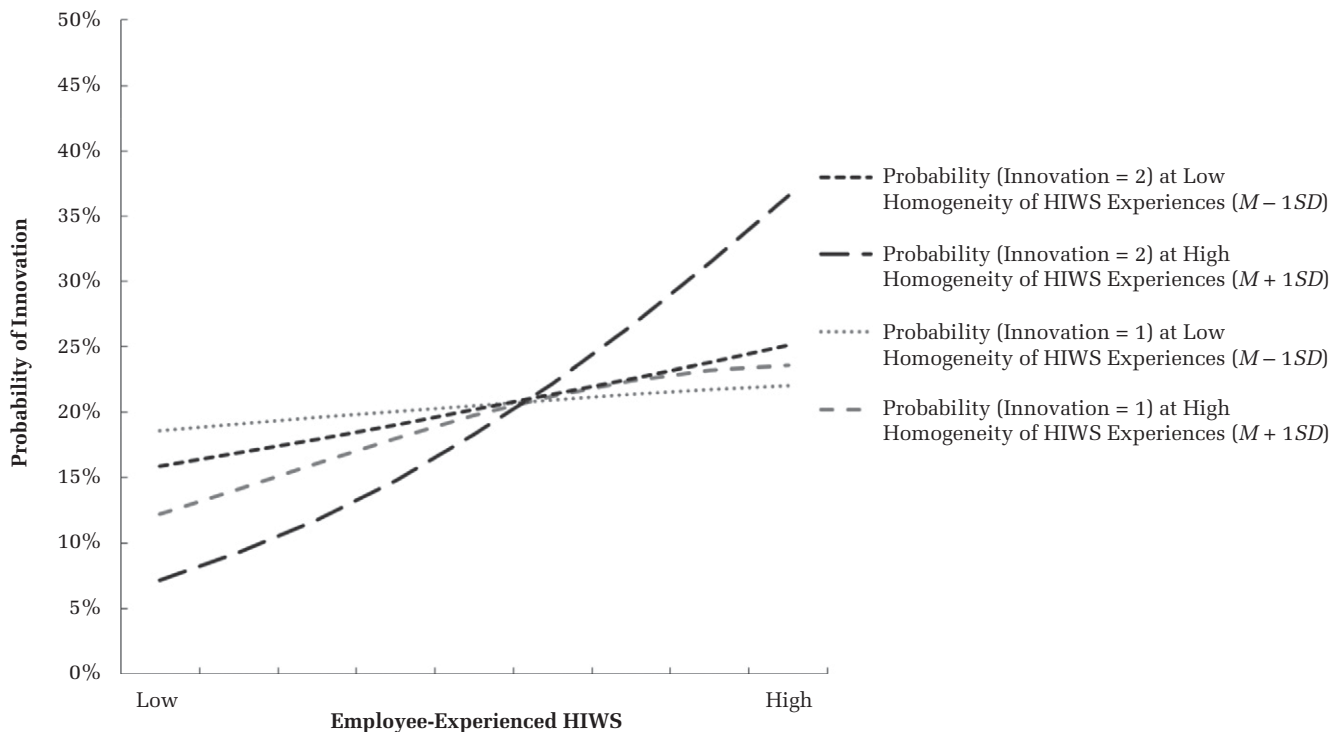
Moving beyond HRM architecture, our study attempts to uncover the origin of innovation by investigating the emergence-enabling process for an employee-experienced HIWS to give rise to innovation. Developing an emergence-based HRM framework, our study reveals three distinct emergence enablers (i.e., the homogeneity of HIWS experiences, the strategic importance of innovation, and the churn in human resources) that facilitate an

employee-experienced HIWS to yield innovation. Below, we discuss the theoretical and practical implications of our research.

Theoretical and Practical Implications

Our emergence-based HRM framework furthers our understanding about the resource-based view in the HRM field (Barney & Wright, 1998). According to Colbert (2004), HRM can serve as a source of sustainable competitive advantage by cultivating heterogeneous human capital resources through developing and nurturing interpersonal relations with causal ambiguity and social complexity. Nevertheless, we have limited understanding about the process through which HRM yields knowledge-based value creation, partly because it is nearly impossible to directly explicate the configuration of

FIGURE 2
The Interaction between Employee-Experienced HIWS and the Homogeneity of HIWS Experiences on Innovation



complex collective interactions. As Colbert and Kurucz (2011: 401) noted, the core of the resource-based view includes a paradox:

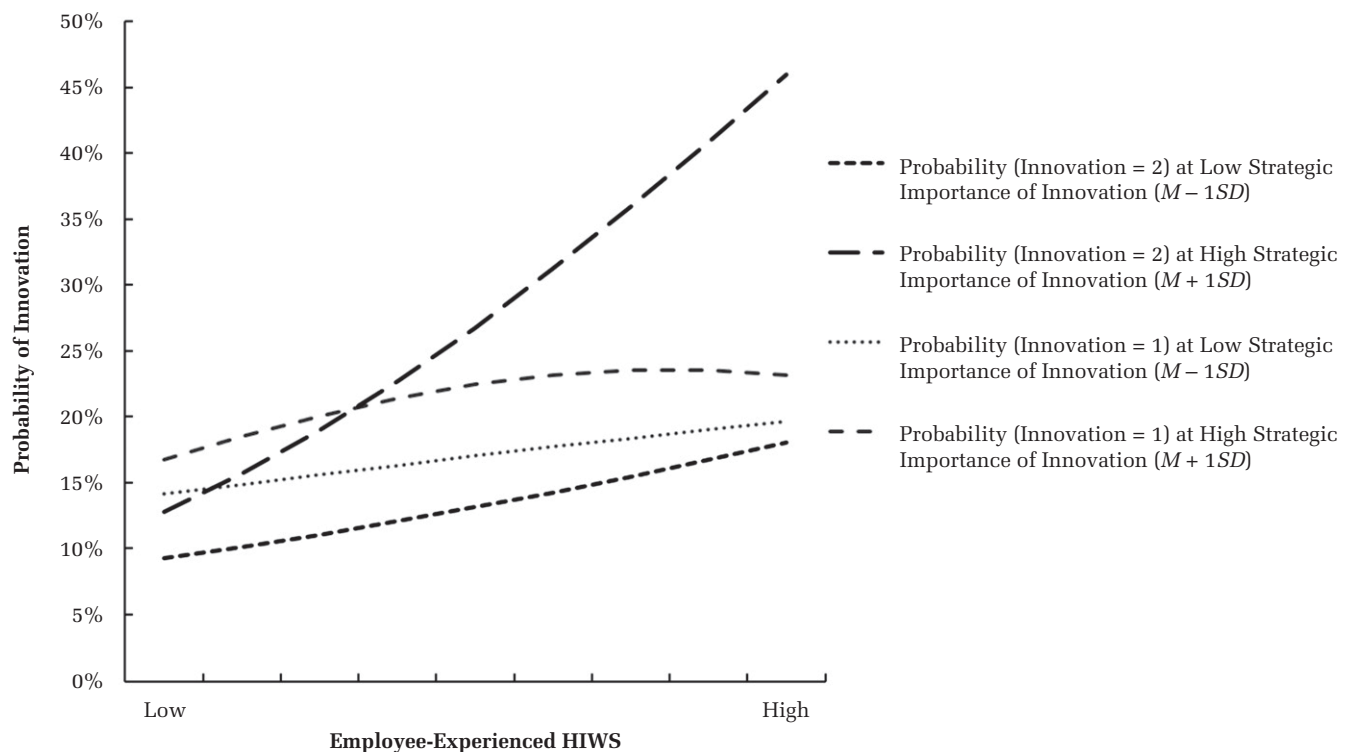
... those features of resources which create and protect the essence of a sustained resource-based advantage (i.e., characterized by causal ambiguity, based upon socially embedded, complex knowledge and capabilities), also make them inscrutable and unpredictable, and therefore difficult if not impossible to engineer and manage.

However, our findings suggest that, although the “reverse engineering” of collective interactions is almost impossible, organizations can manage the emergence of human resources by shaping the features of collective interactions (i.e., concertedness, direction, and adaptability), furthering our understanding about the microfoundations of the resource-based view.

For the internal mechanism, we investigated how the homogeneity of employees’ HIWS experiences shaped the HIWS–innovation relation. Our result demonstrated that the positive relation between a HIWS and innovation was stronger when employees’ HIWS experiences were more homogeneous.

As Wright and Nishii (2013) stated, strategic HRM researchers primarily focus on examining the variances across organizations, with far less attention being paid to the variances within organizations (e.g., variability in employees’ HRM experiences), limiting our understanding about the cross-level nature of organizational phenomena. As one of the first empirical studies examining the moderating role of homogeneity in employees’ HRM experiences, we demonstrated the importance of introducing within-organization variances in understanding the process for HRM to impact organizational outcomes. In addition, it is important to note that our focus on the homogeneity of employees’ HRM experiences diverges from Bowen and Ostroff’s (2004) focus on HRM system strength. Specifically, “HRM system strength” refers to the extent to which an HRM system sends unambiguous messages about the responses and behaviors that are expected, rewarded, and valued by the organization (Ostroff & Bowen, 2016). In other words, it is based on whether employees share an understanding about organizations’ desired work behaviors. By contrast, our study focuses on the variability of employees’ HRM experiences, rather than

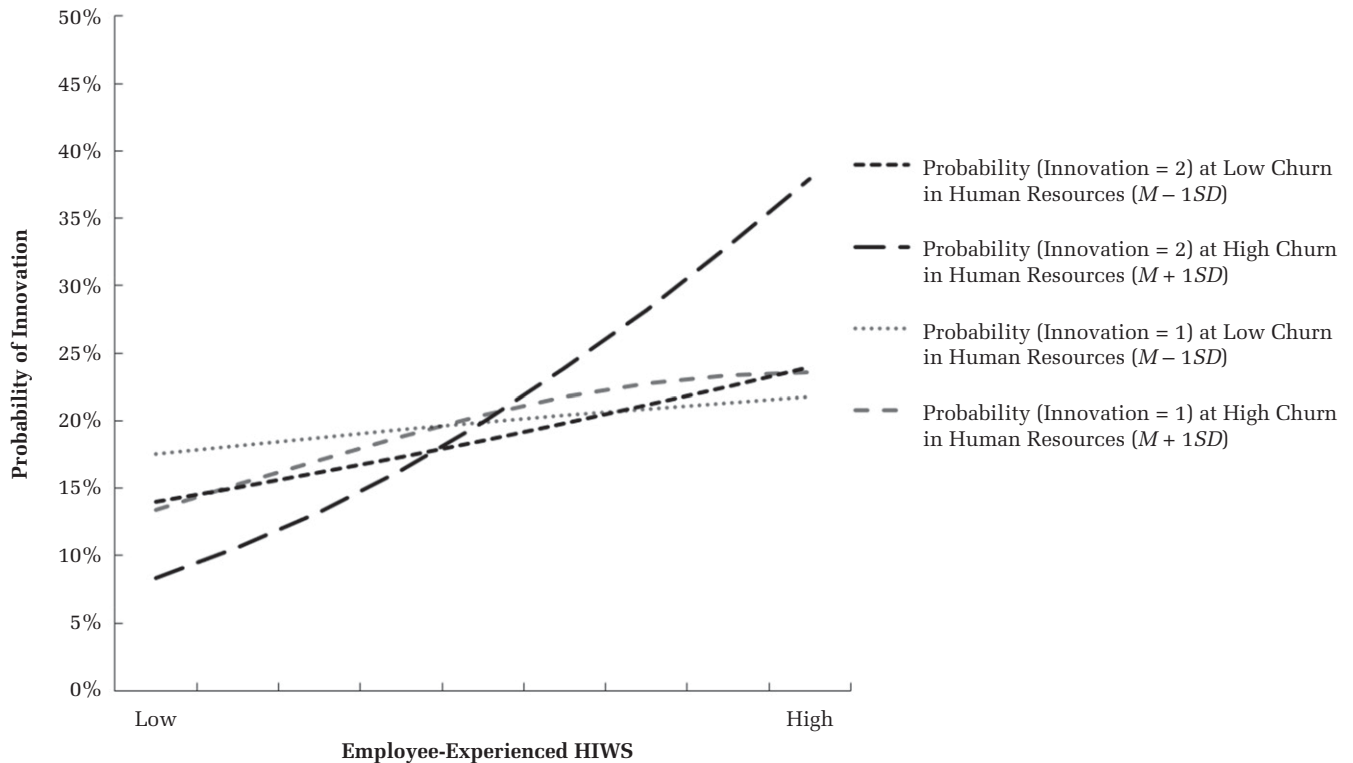
FIGURE 3
The Interaction between Employee-Experienced HIWS and the Strategic Importance of Innovation on Innovation



their shared understanding of desired work behaviors signaled by the HRM system.

For the external mechanism, our finding demonstrated that high strategic importance of innovation amplified the positive relation between an employee-experienced HIWS and innovation. Prior studies on the strategic contingency of HRM have mainly focused on the alignment of HRM systems with competitive strategies (e.g., differentiation vs. cost leadership; Huselid, 1995). As summarized by Jackson, Schuler, and Jiang (2014), empirical findings on the moderating roles of competitive strategies have been inconsistent, which might reflect the fact that firms achieve their strategy through various ways (e.g., firms can pursue a differentiation strategy by focusing on innovation or quality management) and the measures of business strategies often ignore different strategic priorities. Our study distinguishes from previous research in that we push beyond competitive strategies to directly capture organizations' strategic need and priority regarding innovation. By directly examining the strategic importance of innovation, our study contributes to the strategic contingency of HRM.

For the temporal mechanism, we introduced the concept of churn to the HRM literature to investigate how human resource flow shaped the relation between HIWSs and innovation. It is important to note that the churn in human resources is an emergent construct that describes the total quantitative human resource flow, regardless of the qualitative changes associated with employee departures and replacements (Nyberg & Ployhart, 2013). Our finding demonstrated that the churn in human resources amplified the positive effect of an employee-experienced HIWS on innovation by improving the adaptability associated with collective interactions. Our findings suggest that the departures of existing employees and the addition of new employees may benefit innovation by reducing organizational stagnation and increasing the variety of perspectives in the organization. However, it is also possible that employee mobility has a negative influence on operating efficiency, due to the disruption of existing routines and the loss of accumulated experience and expertise (Burmeister & Deller, 2016; Shaw, 2011; Shaw, Park, & Kim, 2013). Therefore, when it comes to organizational performance, the churn in human

FIGURE 4**The Interaction between Employee-Experienced HIWS and the Churn in Human Resources on Innovation**

resources may function as a double-edged sword. One relevant study that helps explain the tension between efficiency and innovation was conducted by Argote, Insko, Yovetich, and Romero (1995), who found that the negative effect of human resource churn on work group performance was less pronounced for complex (vs. simple) tasks. They attributed this difference in the human resource churn's effect to the fact that performing complex tasks requires a greater level of innovation.

For managerial practice, this study informs the central role that HRM plays in promoting innovation. For organizations that are actively competing by innovating, we demonstrated the importance of applying a HIWS to elicit collective interactions for knowledge exchange and aggregation. Further, in facilitating a HIWS to generate innovation, we suggest that organizations need to systematically manage the emergence-enabling process for the aggregation of human resources. Specifically, according to our research findings, the homogeneity of employees' HIWS experiences amplified the positive effect of a HIWS on innovation, indicating that organizations could extract additional value from HRM by implementing a HIWS uniformly across employees. Yet, if an

organization is trying to compete on the basis of innovation, simply focusing on HRM systems is far from enough. In particular, based on our research findings, a HIWS could better promote innovation when organizations attached more strategic value to innovation. As such, organizations should have clear strategic goals and recognize the potential value of innovation in support of their goals. In addition, organizations ought to clearly communicate their strategic needs to the workforce to ensure that employees' collective efforts are channeled toward the right direction. Finally, this study demonstrated the importance of maintaining a dynamic workforce to refresh the knowledge reservoir and improve organizational adaptability. Therefore, firms should take a dynamic perspective and actively manage the inflow and outflow of employees over time.

Limitations and Future Directions

Our study has several limitations. First, we analyzed archival data collected by Statistics Canada, so our measures were constrained by the survey questions in the WES. In particular, with a dichotomous measure, we only evaluated the existence of

employees' experiences with a HIWS and were unable to adequately capture the extent to which each HRM practice was implemented across employees. Nevertheless, by aggregating employee responses to the workplace level, our measure reflected the coverage of a HIWS among employees. Further, when examining human resource flow, we only focused on the quantity of employee mobility and were unable to evaluate the quality of employee mobility, limiting our understanding about the inner workings of human resource flow (Nyberg & Ployhart, 2013). In addition, our measure for innovation was also restricted by the available survey questions. Because the two items used to measure innovation were dichotomous, we were unable to adequately capture the level of product and process innovation.

Second, the scope of the WES measures restricted our ability to directly test the mediating processes for proposed emergence enablers to amplify the beneficial influence of a HIWS on innovation. Therefore, to gain in-depth understanding regarding the emergence process of human resources, we suggest that researchers conduct field studies to empirically test the inner workings of the three emergence enablers. For example, researchers could build a moderated mediation model to examine the potential mediators (e.g., transactive memory system, interpersonal communication, and collective cohesion) through which the emergence enablers shape the HIWS–innovation relation.

Third, due to the limitation of the WES data set, we were unable to distinguish between exploitative innovation and explorative innovation, both of which are critical for organizational adaptation. Whereas “exploitative innovation” seeks to exploit existing products or services by leveraging current knowledge and competencies, “explorative innovation” develops new products or services by pursuing fundamentally new knowledge and capabilities (Benner & Tushman, 2003). Therefore, we raise an important research question about whether the two types of innovation differ in terms of their human capital resource emergence processes.

In this study, we used the homogeneity of HIWS experiences, the strategic importance of innovation, and the churn in human resources to probe and test the emergence-enabling mechanisms for innovation. We acknowledge that other organizational factors might also shape the patterns of collective interactions. Thus, an important area for future research will be to move beyond the three studied variables to identify other factors that can either facilitate or inhibit the emergence of human resources

cultivated by HRM systems. For example, future research might consider the developmental stages of organizations and investigate how organizational life cycles (e.g., organizational initiation, functional growth, controlled growth, and strategic integration; Milliman, Von Glinow, & Nathan, 1991) shape the HIWS–innovation relation by influencing the adaptability associated with collective interactions. For example, compared with those at later developmental stages, organizations at earlier developmental stages may be more sensitive to environmental changes and open to knowledge transfer. Thus, these organizations are more likely to innovate when taking advantage of a HIWS. We hope our emergence-based HRM framework can stimulate more in-depth work adopting the lens of emergence to study organization-level phenomena.

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