

# EXPLAINING THE LINK BETWEEN HUMAN RESOURCE PRACTICES AND INNOVATION PERFORMANCE: THE ROLE OF ORGANIZATIONAL LEARNING PROCESSES\*

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**Victor Oltra\*\***

victor.oltra@uv.es

Department of Management 'Juan José Renau Piqueras'  
University of Valencia, Spain

**Joaquin Alegre**

joaquin.alegre@uv.es

Department of Management 'Juan José Renau Piqueras'  
University of Valencia, Spain

## ABSTRACT

This theoretical paper makes a preliminary attempt to integrate the – so far usually disconnected – literatures on: (i) linking human resource (HR) practices and innovation performance, (ii) assessing organizational learning (capability) (OL/C), (iii) linking HR practices and OL(C), or (iv) linking OL(C) and innovation. We clearly distinguish between policy-based variables (a system of *innovation-triggering HR practices*) and processual, mediating ones of a behavioural nature (a system of *knowledge-optimizing OL processes*), all of them eventually impacting on *innovation performance* (composed by innovation efficacy and innovation efficiency). The proposed framework is expected to facilitate further (theoretical and empirical) research into the HR-OL-innovation connections.

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## \*\* Corresponding author:

Victor Oltra  
Department of Management 'Juan José Renau Piqueras'  
Facultat d'Economia  
Universitat de València  
Av. Tarongers, s/n  
46022 Valencia, Spain

## 1. INTRODUCTION

Abundant research shows substantial evidence on the positive link between human resource (HR) practices and organizational performance (e.g. Datta et al., 2005; Delery and Doty 1996; Huselid 1995). Hence, it seems natural to assume that the impact of (high-commitment, contingent, strategic...) HR practices on *innovation* performance ought to be also positive. Such a specific link has also been explored (e.g. Beugelsdijk, 2008; Jiménez-Jiménez and Sanz-Valle, 2008; Shipton et al., 2006a; Walsworth and Verma, 2007): innovation-triggering HR practices would include employee empowerment, task rotation, employment security or the use of participative decision making systems, among others. However, satisfactory consensus and insight have not been reached on: (i) the choice of innovation-triggering HR practices, (ii) their ultimate impact on innovation outcomes, and (iii) the underlying processes and mediating variables that would help explain *how* such a link is developed – similar to what happens with the broader HR-performance literature (cf. Boselie et al., 2005; Wall and Wood, 2005; Wood, 1999).

The aim of this theoretical paper is twofold: (i) to *deepen into the connections between HR practices and innovation performance*, and (ii) to *shed light on the underlying processes and mediating variables that explain these connections*. Having these concerns in mind, organizational learning (OL) can be easily linked to innovation outcomes and, more specifically, to the process dynamics that foster them. Innovation, as the culmination of the complex interplay between multiple – individual and collective – learning processes aimed at finding new ways of solving problems, depends on the company's capability to learn – i.e. to develop, distribute and use new knowledge (McKee, 1992; Wheelwright and Clark, 1992).

Furthermore, Hult et al. (2004) observed that, if a firm is to be innovative, management must devise organizational features that embody a clear learning orientation. Some cultural factors, such as decentralization in decision making, error tolerance, or social relations, have been shown to affect knowledge and innovation outcomes through OL (Chang, 2003; Lemon and Sahota, 2004). Interestingly, Chiva et al. (2007) measured OL capability (OLC) by understanding it as a multidimensional concept, including experimentation, risk taking, interaction with the external environment, dialogue and participative decision making – essential enablers of the OL dynamics. Indeed, research evidence places OLC as a relevant predictor of innovation performance (Alegre and Chiva, 2008). Moreover, Scarbrough (2003) explored how connections between HR management (HRM) and knowledge management (KM) processes, if neglected, pose strong barriers to successful innovation. Jiménez-Jiménez and Sanz-Valle (2007) studied the complex relationships among HR practices, KM and technical innovation. More recently, Chen and Huang (2009) have highlighted the role of 'KM capacity' in linking strategic HR practices with innovation performance.

In this paper, a number of related concepts such as learning orientation, OLC or KM (capacity) inspire our proposal of 'OL processes' as the fundamental mediating variable between HR practices and innovation performance. We emphasize in purpose the distinction between (HR) *practices* and (OL) *processes*: the former are formal business policies, whereas the latter are resulting (middle) outcomes, more behavioural in nature and not so directly controlled by management. This distinction is often blurry in the literature, considering that HRM and OL(C)/KM constructs frequently include some elements (even questionnaire items) that are very similar. But this distinction is, to our view, essential to clearly differentiate between policy/intentional variables and

behaviour/attitudinal ones, thus increasing the rigour of efforts to open the ‘black box’ linking HR practices and (innovation) performance through OL/KM dynamics. Hence, the main contribution of this paper consists of *deepening into the analysis of connections between HR practices, OL processes and innovation performance*.

The paper is structured as follows. After this introduction, using the HRM-performance discussion as the initial background, we briefly review the main literature focusing on the HRM-innovation link. We then tackle the OL(C)-innovation link, justifying the appropriateness of considering OL(C) as a key mediator between HR practices and innovation. Next, we present an integrated framework encompassing a system of innovation-triggering HR practices, (mediating) OL processes and (resulting) innovation performance. In order to emphasize the difference between policy (HRM) and process (OL) variables, we originally construe OL processes as a set of complementary dynamics aimed at tackling knowledge ambiguity, distribution and disruptiveness (cf. Newell, 2005), so knowledge-optimizing processes are enhanced. We conclude the paper by highlighting its contribution, limitations, and further research challenges.

## 2. HUMAN RESOURCE PRACTICES AND (INNOVATION) PERFORMANCE

Abundant research, from a diversity of viewpoints in the HRM domain, has provided evidence on the positive link between HR practices and organizational performance (e.g. Arthur 1992, 1994; Cutcher-Gershenfeld 1991; Datta et al., 2005; Delaney and Huselid 1996; Delery and Doty 1996; Huselid 1995; Huselid et al., 1997; Ichniowski et al., 1997; MacDuffie 1995; Youndt et al., 1996). However, research approaches are highly heterogeneous (Boselie et al., 2005; Wood 1999), so results produced by different investigations cannot be properly compared. These problems, raised throughout the past couple of decades by a number of scholars (e.g. Gerhart 1999; Legge 2001; Paauwe and Boselie 2005; Purcell 1999; Truss 2001; Wright and Sherman 1999) have not been solved yet – as acknowledged by insightful reviews of the HRM-performance literature (e.g. Boselie et al., 2005).

According to the so-called *universalistic approach*, the existence a set of HR ‘best practices’, universally applicable, is proclaimed (classical works are e.g. O’Toole 1985; Walton 1985; Lawler 1986; Kochan and Osterman, 1994; Pfeffer 1994a,b). Many labels for such practices coexist, for example: ‘(high) commitment practices (or systems)’ (Arthur 1992, 1994; Wood and de Menezes 1998), ‘high performance work practices’ (Becker and Gerhart 1996; Huselid 1995), ‘progressive practices’ (Delaney and Huselid 1996), ‘innovative practices’ (Ichniowski et al., 1997; MacDuffie 1995; Osterman 1994), ‘commitment strategy’ (Walton 1985), ‘high involvement practices’ (Lawler 1986), ‘human-capital-enhancing HR systems’ (Youndt et al., 1996), ‘mutual gains practices’ (Kochan and Osterman 1994), ‘mutual commitment practices’ (Kochan and Dyer 2001), ‘transformational labour-management relations’ (Cutcher-Gershenfeld 1991), or plainly ‘best practices’ (Delery and Doty 1996). There are many different proposals of ‘universal best practices’; just as an example, perhaps Delery and Doty’s (1996) synthesis may be quite illustrative: internal career ladders, formal training systems, results-oriented appraisal, performance-based compensation, employment security, employee voice, and broadly defined jobs. The arguments for universalism are strong, often overwhelming the reader with attractive explanations, combining a hardly rejectable combination of common sense and evidence based upon a diversity of real-life cases and examples (e.g. Lawler 1993; Lawler et al., 1995; Pfeffer 1998a,b,c).

Although more clearly academic studies are also abundant (e.g. Cutcher-Gershenfeld, 1991; Arthur, 1994; Huselid, 1995; MacDuffie, 1995; Delaney and Huselid, 1996), important limitations of universalistic studies have been put forward (e.g. Becker and Gerhart 1996; Gerhart 1999; Purcell 1999; Truss 2001), notably the heterogeneity of (theoretical and/or empirical) (sub)approaches: some studies focus on just one practice, others a few unrelated practices, and others on the joint effect of an integrated system of practices – with varying, incomparable results.

From the (alternative to universalism) *contingent approach*, business strategy stands as the most common factor considered for achieving the ‘best fit’ with HR practices. Porter’s (1980) and Miles and Snow’s (1978) seminal frameworks are the bases for subsequent research on the HRM-performance relationship mediated by strategy. Especially, Miles and Snow’s (1984) and Schuler and Jackson’s (1987) HRM-strategy frameworks emphasized the so-called ‘vertical fit’ (e.g. Delery and Doty 1996) between HR systems and business strategy, inspiring further research. Miles and Snow (1984) differentiated between ‘make’ (internal HR development) vs. ‘buy’ (external HR acquisition) systems, whereas Schuler and Jackson (1987) identified three alternative ‘cost’, ‘quality’ and ‘innovation’ based HR systems. Despite the apparent sophistication compared to universalism, the contingent field is also heterogeneous and inconclusive. Some studies test the consistency of HR systems (i.e. emphasis on both horizontal and vertical fit, the first being among practices and the latter usually between practices and strategy); others test single practices, either independently (e.g. Balkin and Gomez-Mejia 1987) or complementarily to testing whole HR systems (e.g. Delery and Doty 1996). Overall results are mixed, and clear support for a ‘superior’ set of contingent hypotheses cannot be confidently claimed.

As a result, notwithstanding the specific HRM research approach taken, it is noteworthy the lack of consensus on the specific mechanisms that mediate between HR practices and ultimate (organizational) performance (see e.g. Boselie et al., 2005, for an insightful review). Considering this situation, and taking into account the heterogeneity of performance measures used in the HRM-performance research, specific performance indicators are advisable to increase overall research rigour and joint validity of results. Among these, innovation outcomes have been increasingly popular as the basis for organizational performance indicators in the (strategic) HRM domain (e.g. Beugelsdijk, 2008; Jiménez-Jiménez and Sanz-Valle, 2008; Laursen and Foss, 2003; Shipton et al., 2006a,b; Walsworth and Verma, 2007). Innovation is indeed closely related to (broader) organizational performance (Jiménez-Jiménez and Sanz-Valle, 2008), and makes sense to relate it to HR practices under a more comprehensive (strategic) HRM approach that, beyond universalism and contingency, encompasses deeper configurational (cf. Delery and Doty, 1996) and – especially – contextual considerations (cf. Martín-Alcázar et al., 2005) – in our paper: *HR systems in a context of learning and innovation*. Moreover, as opposed to more traditional (short term) financial or market based indicators, in the current context of globalized, turbulent business environments, innovation may well offer a more accurate prediction of the organization’s ability to achieve and sustain competitive advantage in the longer term.

Gupta and Singh (1993) were among the first to say that ‘people, not products are an innovative company’s major assets’ (p. 41), a widely acknowledged statement nowadays. They identified four dimensions around which HRM strategies can foster innovation and creativity: HR planning, performance appraisal, reward systems, and career management. Specific innovation-triggering elements (within each of these dimensions) would include, among others, venture teams with balanced skill mix (HR

planning), encouraging risk taking (performance appraisal), freedom to fail (reward systems), or empowering people (career management).

But it was not until well into the 2000s that solid empirical work appeared that tackled the nuances of the HRM-innovation link. The research group led by West and Shipton in the UK have pioneered investigations on the impact of (bundles or aspects of) HR practices (usually in the high-performance/high-commitment domain) on innovation outcomes. Shipton et al. (2005) suggested that ‘sophisticated approaches’ to recruitment and selection, induction, appraisal and training predict organizational innovation – and the appraisal-remuneration link inhibits it. Training and induction were also shown as innovation predictors by Shipton et al. (2006a), who added team working and ‘exploratory learning HR practices’ (e.g. engagement with customers and suppliers, or ‘on the job’ development) as innovation supportive practices. Shipton et al. (2005) also tested the positive influence of a ‘learning climate’ on innovation, the former measured as a combination of four HR practices: formal mentoring system, formal shopfloor employee-supervisor meetings for career development, formal managerial employee-supervisor meetings for career development, and formal statements on the importance of employee development. Moving towards more attitudinal aspects of HRM, i.e. intermediate outcomes linking ‘official’ HR policies and organizational (innovation) performance, Shipton et al. (2006b) posited aggregate job satisfaction as a significant predictor of organizational innovation. Combining the results of these contributions, it is logical to assume that, in innovation-intensive contexts, (knowledge) workers’ (cf. Tampoe, 1993) satisfaction will increase as a result of experiencing HR practices such as sophisticated recruitment and selection, induction, appraisal, and training, combined with team working.

Jiménez-Jiménez and Sanz-Valle (2005, 2007, 2008) have also empirically investigated the HRM-innovation link. As a result of literature reviews mainly focused on (HRM-performance) contingent perspectives (e.g. Schuler and Jackson, 1987; Miles and Snow, 1984), these authors tested the suitability of those HR practices most likely to be appropriate for innovation-oriented (business) strategies. Jiménez-Jiménez and Sanz-Valle (2005) showed a positive link between innovation and an internally consistent system of Schuler and Jackson’s (1987) HR practices aimed at innovation: external recruitment, high employment security, broad application of training, use of internal career paths, use of performance appraisal systems, incentive-based compensation and high employee participation. The innovation-triggering HRM system has been more recently refined – and positively tested – by the same authors (Jiménez-Jiménez and Sanz-Valle, 2008), comprising: flexible job design and empowerment, team working, long-term and skill oriented staffing, extensive and long-term oriented training, broad career opportunities, behaviour-based appraisal, and organic compensation system.

Other relevant contributions also deserve comment. Walsworth and Verma (2007) found a positive relationship between autonomy training and innovation, whereas variable pay contributed very little to innovation. The latter weak relationship is also implied by Foss and Laursen (2005) in their agency theory based analysis in the context of environmental uncertainty, whereas delegation is found to be positively related to innovation in the same study. More recently, Beugelsdijk (2008) confirmed the positive impact of the following HR practices on innovation: task autonomy, training and task rotation, performance-based pay and flexible working hours. Beugelsdijk (2008) also found that employment insecurity (i.e. standby contracts) is negatively related to innovation.

### **3. OPENING THE HRM-PERFORMANCE ‘BLACK BOX’: ORGANIZATIONAL LEARNING (CAPABILITY) AND INNOVATION**

Innovation is increasingly regarded as a result of successfully managing organizational knowledge (Chen and Huang, 2009; Lemon and Sahota, 2004; Scarbrough, 2003; Swan et al., 1999) and, more broadly, of optimizing OL processes (Alegre and Chiva, 2007). The concept of OLC (DiBella et al., 1996; Yeung et al., 1999) deserves special attention here. As a relevant predictor of innovation performance (Alegre and Chiva, 2008), OLC encompasses important (attitudinal and processual) mechanisms that seem to mediate between HRM and innovation.

Jerez-Gómez et al. (2004; 2005a,b) developed an OLC measurement scale that included four dimensions: managerial commitment (to learning)/learning commitment, systems perspective, openness and experimentation, and knowledge transfer (and integration). Jerez-Gómez et al. (2004) tested the relationship between the company’s training strategy and OLC: ongoing training, team based training and job rotation are found to have a positive influence on OLC – although not multi-skill training. Jerez-Gómez et al. (2005b) also tested the impact of ‘appropriate’ compensation strategies upon OL: skill-based pay, pay level and group-based incentives were found to be positively related to OLC – unlike use of (individual) incentives and long-term pay.

Alegre and Chiva (Alegre and Chiva, 2008; Chiva and Alegre, 2008, 2009; Chiva et al., 2007) proposed a different OLC measurement scale, identifying five dimensions or mechanisms through which OLC is defined: experimentation, risk taking, interaction with the external environment, dialogue, and participative decision making. Alegre and Chiva (2008) confirmed a positive impact of their OLC construct on (product) innovation performance. Interestingly, Chiva and Alegre (2008, 2009) proved that OLC and job satisfaction are strongly linked. This is consistent with (the aforementioned) Shipton et al.’s (2006b) tests of the links between (aggregate) job satisfaction and innovation, as a kind of self-reinforcing cycle: the dimensions of OLC are likely to (intrinsically) motivate (knowledge) workers, increasing their job satisfaction and, in turn, catalyzing the innovative potential of OLC dimensions.

According to the above reflections, the contents of OLC, its relationship with job satisfaction, and its relevant impact on innovation, provide a robust support for considering OL processes as a key mediator between HR practices and (innovation) performance. In connection with these issues, West et al. (2004), in their conceptual inquiry into the process of innovative team development, proposed a comprehensive input-processes-outputs model. According to this model, the ‘inputs’ are defined as a combination of HRM issues. Some of them are related to HR practices: selection of innovative people, diversity in skills and demography, and rewards for innovation. Others are connected to contextual issues closer to the concept of OLC: learning and development climate, and climate for innovation. The ‘processes’ are comprised of several issues that would mediate towards achieving successful innovation: norms for innovation, reflexivity, leadership supportive for innovation, conflict and dissent, and bridging across teams. The ‘outputs’ refer to different innovation dimensions: radicalness, novelty and magnitude.

Indeed, if a firm is to be innovative, management must devise organizational features that embody a clear ‘learning orientation’, a concept that revolves around the development of new insights and knowledge, and the related cultural and behavioural change (Hult et al., 2004). Indeed, OL has been included as a relevant variable in

theoretical frameworks trying to explain strategic HRM systems and dynamics (e.g. Snell et al., 1996). Hence, it makes sense to construe the ‘learning orientation’ as an attitudinal/behavioural variable, which may well be fostered by HR practices, such as e.g. ongoing training and task rotation (facilitating new insights and knowledge), flexible working hours (disseminating new values and culture change), or creativity-based performance appraisal systems (shaping new behaviours in employees).

As already stated, in this paper we aim at clearly differentiating, in a context of HRM, between formal policies and ongoing (learning) processes, so the latter would mediate the impact of the former upon innovation performance. In the next section, we will propose a selection of *innovation-triggering HR practices* as our basic conceptual input for defining a system of HRM-related formal policies as the key input of our framework. In turn, the concepts of OLC and ‘learning orientation’ inspire our proposal of a processual, mediating variable towards innovation. However, some elements of the existing OLC constructions are closer to policies than processes (notably participative decision making), and others’ (policy vs. process) status seems blurry (e.g. learning commitment or risk taking). Therefore, we feel compelled to turn to additional conceptual tools in order to satisfactorily achieve our goals.

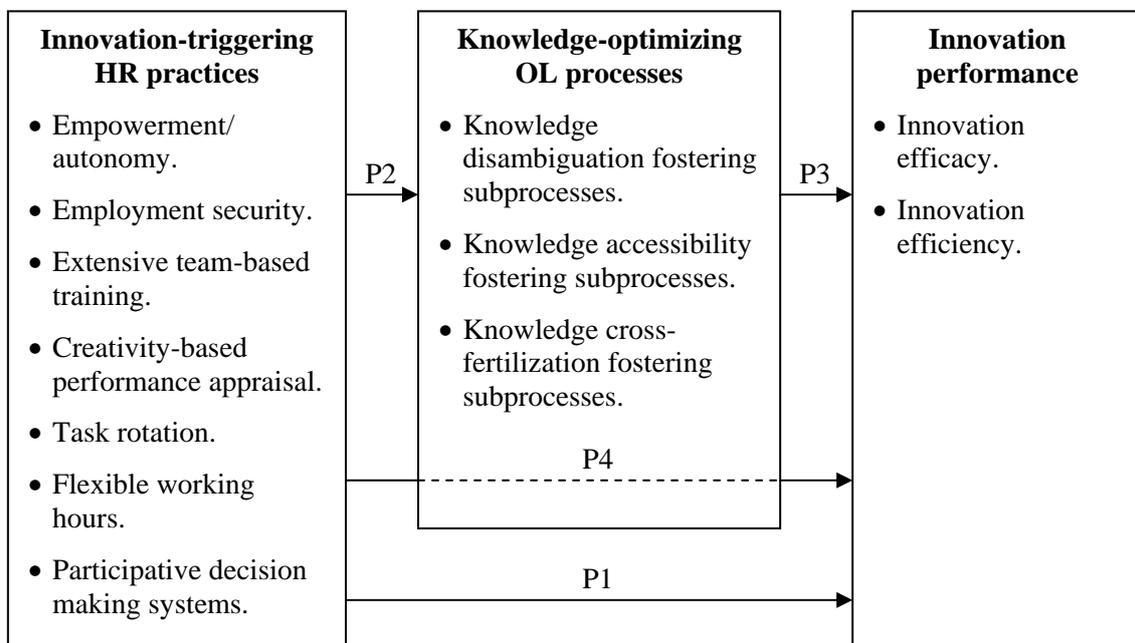
Certainly, in the context of OLC and other OL-related research streams, the successful cross-organizational creation, transfer an application of knowledge is the key indicator of functional OL processes that, eventually, foster innovation. In this sense, in order to deepen into the processual nature of OL, it is fundamental to be aware of the complex nature of knowledge itself, as the ‘key actor’ that shapes the stock-flow ongoing relationships (cf. Bontis et al., 2002) that define OL. A number of characteristics of knowledge that make its transfer problematic have been identified in the literature. According to Newell (2005), these are knowledge *ambiguity* (people/groups attribute different meanings to the same concepts), knowledge *distribution* (people/groups are knowledgeable about different areas of expertise and often do not know what it is what others know), and knowledge *disruptiveness* (people/groups are afraid of losing their status and power in case they share what they know). Relevant contributions have explored the complexities derived from the problematic nature of knowledge (e.g. Argote et al., 2003; McInerney, 2002; Tsoukas, 1996; Tsoukas and Vladimirov, 2001), especially in the context of knowledge-intensive projects – notably *innovation* projects – which require effective knowledge transfer processes (e.g. Carlile, 2002; Dougherty, 1992; Newell, 2005; Newell et al., 2006; Orlikowski, 2002; Pan et al., 2007).

Accordingly, we propose to construe *knowledge-optimizing OL processes* (mediating between HR practices and innovation performance) as a combination of three factors (i.e. ongoing subprocesses) that would aim at tackling each of the three aforementioned problematic characteristics of knowledge, namely ambiguity, distribution and disruptiveness. Trying to find accurate antonyms for these problematic characteristics of knowledge, the knowledge-optimizing (sub)processes are named, respectively, knowledge *disambiguation* fostering processes, knowledge *accessibility* fostering processes, and knowledge *cross-fertilization* fostering processes. These three subprocesses should be optimized between individuals within teams, and also between teams across the organization. Following Newell et al. (2004), we find it useful to refer intra-team knowledge optimization as ‘knowledge bonding’, and to cross-organizational one as ‘knowledge bridging’, both dynamics being equally important to develop successful knowledge-optimizing OL processes.

Finally, we propose to construe *innovation performance* in our framework as a combination of two dimensions, efficacy and efficiency, as operationalized by Alegre et al. (2009) through their validated scale. Innovation efficacy shows the degree of success of an innovation (e.g. product replacement rate or extension of product range). Innovation efficiency reveals the effort made to achieve that degree of success (e.g. time and cost of innovation projects).

#### 4. INNOVATION-TRIGGERING HUMAN RESOURCE PRACTICES, KNOWLEDGE-OPTIMIZING ORGANIZATIONAL LEARNING PROCESSES AND INNOVATION PERFORMANCE: AN INTEGRATED FRAMEWORK

In this section, an integrated framework connecting HR practices, OL processes and innovation performance is proposed as a basis for further research. Prior concepts and analyses are revisited, refined, interlinked or extended, and tentative propositions are formulated. Figure 1 shows the basic elements of our framework.



**Figure 1. An integrated framework linking HR practices, OL processes and innovation performance.**

According to extant evidence, as reviewed in the previous sections, further inquiries into innovation-triggering HR practices should focus on the following aspects:

- empowerment/autonomy (Beugelsdijk, 2008; Foss and Laursen, 2005; Gupta and Singhal, 1993; Jiménez-Jiménez and Sanz-Valle, 2008);
- employment security (Beugelsdijk, 2008; Jiménez-Jiménez and Sanz-Valle, 2008);
- extensive team-based training (Shipton et al., 2005, 2006a; Jerez-Gómez et al., 2004; Jiménez-Jiménez and Sanz-Valle, 2008);

- creativity-based performance appraisal (Jiménez-Jiménez and Sanz-Valle, 2008; West et al., 2004);
- task rotation (Beugelsdijk, 2008; Jerez-Gómez et al., 2004; Jiménez-Jiménez and Sanz-Valle, 2008);
- flexible working hours (Beugelsdijk, 2008; Jiménez-Jiménez and Sanz-Valle, 2008);
- participative decision making systems (Alegre and Chiva, 2008; Chiva and Alegre, 2008, 2009; Chiva et al., 2007; Jiménez-Jiménez and Sanz-Valle, 2005; Shipton et al., 2005, 2006a).

Conversely, due to their inconclusive evidence and intrinsic complexities, HR practices in the domains of multi-skill training (Jerez-Gómez et al., 2004) and variable pay/performance-related rewards (Foss and Laursen, 2005; Jerez-Gómez et al., 2005b; Shipton et al., 2005; Walsworth and Verma, 2007; Wright and Sherman, 1999) should rather not be included as part of an innovation-triggering HRM system.

Derived from the analyses in prior sections, the above synthesis of key aspects of the HRM-innovation link leads us to formulate the first proposition.

*Proposition 1. A system of innovation-triggering HR practices has a positive influence on innovation performance.*

*Proposition 1.a. Employee empowerment/autonomy has a positive influence on innovation performance.*

*Proposition 1.b. Employment security (minimizing the use of temporary contracts) has a positive influence on innovation performance.*

*Proposition 1.c. The use of extensive team-based training has a positive influence on innovation performance.*

*Proposition 1.d. The use of creativity-based performance appraisal has a positive influence on innovation performance.*

*Proposition 1.e. The use of task rotation has a positive influence on innovation performance.*

*Proposition 1.f. The use of flexible working hours has a positive influence on innovation performance.*

*Proposition 1.g. The use of participative decision making systems has a positive influence on innovation performance.*

Regarding the links between HR practices and OL(C)/KM, it must be noted that they have been indeed addressed by the extant literature through diverse approaches (e.g. Jerez-Gómez et al., 2004, 2005b; Oltra, 2005; Scarbrough, 2003; Snell et al., 1996; Soliman and Spooner, 2000; Storey and Quintas, 2001). Consistent with the arguments being developed throughout the paper, thereby focusing on the impact of innovation-triggering HR practices on knowledge-optimizing OL processes, we formulate a second proposition.

*Proposition 2. A system of innovation-triggering HR practices has a positive influence on knowledge-optimizing OL processes.*

*Proposition 2.a. Employee empowerment/autonomy has a positive influence on knowledge-optimizing OL processes.*

*Proposition 2.b. Employment security (minimizing the use of temporary contracts) has a positive influence on knowledge-optimizing OL processes.*

*Proposition 2.c. The use of extensive team-based training has a positive influence on knowledge-optimizing OL processes.*

*Proposition 2.d. The use of creativity-based performance appraisal has a positive influence on knowledge-optimizing OL processes.*

*Proposition 2.e. The use of task rotation has a positive influence on knowledge-optimizing OL processes.*

*Proposition 2.f. The use of flexible working hours has a positive influence on knowledge-optimizing OL processes.*

*Proposition 2.g. The use of participative decision making systems has a positive influence on knowledge-optimizing OL processes.*

As for the connection between OL and innovation performance, we propose to include the previously explained concept of *knowledge-optimizing OL processes* as the independent variable. Many aspects included in the (already mentioned) OLC measurement scales (e.g. Chiva et al., 2007; Jerez-Gómez et al., 2005a), the concept of ‘learning orientation’ (e.g. Hult et al., 2004), and also analyses of the (broader) social and behavioural dynamics of learning processes (e.g. Bontis et al., 2002; Dougherty, 1992; Newell et al., 2006; Pan et al., 2007), would constitute pillars for defining more specific elements of each of the three knowledge-optimizing subprocesses: disambiguation, accessibility and cross-fertilization. These subprocesses would, in turn, aim at respectively tackling each of the aforementioned problematic (antonymously named) characteristics of knowledge, namely ambiguity, distribution and disruptiveness (cf. Newell, 2005), in the two suggested (complementary) levels of analysis, namely intra-team bonds and cross-organizational bridges (cf. Newell et al., 2004). This leads us to formulate a third proposition.

*Proposition 3. Knowledge-optimizing OL processes have a positive influence on innovation performance.*

*Proposition 3.a. Knowledge disambiguation fostering (sub)processes have a positive influence on innovation performance.*

*Proposition 3.b. Knowledge accessibility fostering (sub)processes have a positive influence on innovation performance.*

*Proposition 3.c. Knowledge cross-fertilization fostering (sub)processes have a positive influence on innovation performance.*

Last, but not least, concerning the mediating role of knowledge-optimizing OL processes between HR practices and innovation performance, indeed a crucial argument throughout the paper and a core element of our framework, we formulate a final proposition.

*Proposition 4. The positive effect of a system of innovation-triggering HR practices on innovation performance is enhanced when knowledge-optimizing OL processes are successfully developed.*

*Proposition 4.a. The positive effect of a system of innovation-triggering HR practices on innovation performance is enhanced when knowledge disambiguation fostering OL (sub)processes are successfully developed.*

*Proposition 4.b. The positive effect of a system of innovation-triggering HR practices on innovation performance is enhanced when knowledge accessibility fostering OL (sub)processes are successfully developed.*

*Proposition 4.c. The positive effect of a system of innovation-triggering HR practices on innovation performance is enhanced when knowledge cross-fertilization fostering OL (sub)processes are successfully developed.*

## 5. CONCLUSION

In this paper, we have made a preliminary attempt to integrate the – so far usually disconnected – literatures on the links between HRM and (innovation) performance, OL(C) assessment, the links between HRM and OL(C), and also the OL(C)-innovation link. We have emphasized the distinction between policy-based variables (innovation-triggering HR practices) and processual, mediating ones (OL processes), all of them eventually impacting innovation performance. The behavioural, ongoing and dynamic nature of OL in our framework has been highlighted by defining OL process as a set of specific (sub)processes aimed at tackling three problematic characteristics of knowledge, namely ambiguity, distribution and disruptiveness (cf. Newell, 2005). We have named OL processes in our framework as knowledge-optimizing OL processes, divided into disambiguation fostering, accessibility fostering and cross-fertilization fostering ones. Further definition of the details of these subprocesses remains to be developed, in any case with a strong inspiration from extant and validated OLC proposals (e.g. Chiva et al., 2007; Jerez-Gómez et al., 2005a), and also other relevant contributions dealing with cross-organizational knowledge creation and transfer dynamics that – in one way or another – refer to the aforementioned problematic characteristics of knowledge (e.g. Cabrera and Cabrera, 2002; Carlile, 2002; Dougherty, 1992; Newell, 2005; Newell et al., 2006; Orlikowski, 2002; Pan et al., 2007; Un and Cuervo-Cazurra, 2004).

Several limitations of our paper need to be acknowledged. On the one hand, different types of OL have not been explicitly considered, such as ‘single vs. double loop’ learning (Argyris and Schön, 1978), ‘exploration vs. exploitation’ (March, 1991), ‘feed-forward vs. feedback’ (Crossan et al., 1999), ‘adaptive vs. generative’ learning (Chiva et al., 2010), or alternative ‘knowledge strategies’ (Zack, 1999). Similar criticism can be made of our overlooking of the different types of innovation, such radical vs. incremental, or product vs. process. On the other hand, our literature review has not paid explicit attention to the high diversity of methodological approaches and data analysis methods, and countries or industries where the target populations have been located. All

these – and other – issues may be considered for further (theoretical or empirical) developments of our proposed framework.

At the moment, our paper is a conceptual, preliminary attempt to integrate so far disperse research streams, so it hopefully provides a starting point for further inquiry. The proposed framework may need refinement, and any potential empirical testing should carefully consider item/scale construction, sampling procedures (countries, industries, etc.), data collection and analysis methods, etc. There is abundant empirical literature – much of it cited in this paper – that may help inform on these issues – analyses that have consciously been (mostly) left out of this particular paper.

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