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Organizational context and innovation ambidexterity: Is creativity the missing link?

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Abstract

Creativity might be a prerequisite of technological innovation or an element of it. This article seeks to extend both prior studies that analyse which organizational contexts foster innovation ambidexterity without considering creativity and research that demonstrates a mediating effect of creativity on organizational performance without accounting for innovation ambidexterity. An empirical study of 307 French firms reveals that creativity is a missing link between the organizational context and ambidexterity, a result with interesting implications relative to the prerequisites for creativity and innovation ambidexterity. Managers thus should implement an organizational context that encourages creativity, rather than directly emphasising innovation ambidexterity.

Keywords: ambidexterity, creativity, exploitation/exploration, innovation, organizational context.

Research on the organizational antecedents of ambidexterity offers various results (e.g. Ghoshal and Bartlett, 1994; Gibson and Birkinshaw, 2004; Lubatkin et al., 2006), though even input–process–output views and multilevel models of organizational ambidexterity (Simsek, 2009), acknowledging the need for both exploration and exploitation, tend to ignore the role of creativity. Creativity constitutes a key component of innovation (Amabile, 1988), and it appears associated with not just breakthroughs but also incremental ideas (Audia and Goncalo, 2007). Thus, growing research seeks to identify creativity antecedents (e.g. Binyamin and Carmeli, 2010; Dewett, 2007). Studies of innovation management instead seem to focus more on the conceptual distinction between exploration and exploitation (March, 1991; see also He and Wong, 2004; Li et al., 2008; Lin et al., 2013; O'Reilly and Tushman, 2004; Smith and Tushman, 2005). In this context, even the growing literature on innovation ambidexterity (e.g. Andriopoulos and Lewis, 2010; He and Wong, 2004) generally fails to acknowledge the role of organizational context (Ghoshal and Bartlett, 1994; Gibson and Birkinshaw, 2004; Glynn, 1996), despite the contrasting organizational and managerial dimensions required to support ambidexterity (Andriopoulos and Lewis, 2009). Combining these concepts, we posit that creativity might be considered part of the organizational context, though creativity literature tends to identify it as a mediator between the organizational context and the firm's innovation performance. For example, Im et al. (2013) regard creativity as a critical link between team dynamics and product competitive advantage, and Harney et al. (2009) explore whether a creativity climate mediates the relationship between high performance work practices (e.g. performance management, communication, commitment) and organizational performance.

Therefore, the definition of creativity as a determinant or a mediator remains unclear. But no studies examine its mediating role in the link between a firm's organizational context and ambidexterity. We endeavour to address this gap, in line with a call from Rank et al. (2004, p. 518) to investigate "potential differential antecedents of specific creativity or innovation phases." Accordingly, to determine the impact of creativity on ambidexterity and test for a possible mediating effect of creativity, we start by considering the impact of creativity on exploration and exploitation (i.e. innovation ambidexterity), then

analyse the moderating impact of the organizational context in several hypotheses. After we present our methodology, we discuss the results of the data analyses. Finally, by exploring the main conclusions, we derive implications and suggestions for further research.

1. THEORY AND HYPOTHESES

1.1. CREATIVITY AND ANTECEDENTS OF INNOVATION AMBIDEXTERITY

Organizational ambidexterity refers to the simultaneous pursuit of exploitation and exploration (He and Wong, 2004). Following He and Wong (2004) and Wei et al. (2014a, 2014b), we focus on technological exploration and exploitation. In a technological innovation context, ambidexterity implies a tension between innovation exploration based on new knowledge and innovation exploitation according to the firm's current path (He and Wong, 2004). The goal is to create an organizational context that allows for the pursuit of flexibility and searches for new knowledge, while simultaneously promoting efficiency and the use of existing knowledge, which is challenging. Exploration and exploitation form a paradox, and research efforts to identify resolutions to this paradox have gained prominence (Lin et al., 2013; Wei et al., 2014a, 2014b).

The organizational context might provide such a resolution. An organizational context, or “the systems, processes, and beliefs that shape individual-level behaviours in an organisation” (Gibson and Birkinshaw, 2004, p. 212), is created by general managers, who implement various systems and incentives (Ghoshal and Bartlett, 1994). These general managers seek a balance between fundamentally different requirements. For example, flexibility requires task autonomy, variety, and creativity, but efficiency requires formal rules, hierarchical control, and high levels of standardisation, formalisation, and specialisation. The success of mechanisms for managing the conflict between flexibility and efficiency depends on the broader organizational context as created by the firm's management team. An ideal organizational context thus simultaneously favours efficiency and discovery, but creating the most appropriate alignment to achieve ambidexterity for innovation is a difficult task. As Jansen et al. (2012)

show, the structural and resource attributes of an organizational context also shape the relationship between unit ambidexterity and performance. Other studies focused on innovation ambidexterity note impacts of learning capabilities on ambidexterity and the resulting effects on organizational performance (He and Wong, 2004; Lin et al., 2013).

Many of these variables and organizational antecedents appear related to creativity, yet this concept never appears explicitly and instead is always embedded in other larger notions (e.g. social context, organizational culture). Creativity can provide central support for innovation though, in that it constitutes “the production of a novel and appropriate response, product, or solution to an open-ended task” (Amabile, 2012, p. 3). In the resource-based view (RBV), creativity is the firm’s capacity to create and produce novel ideas, such that it appears as an output, in contrast with its role in a process-oriented perspective (e.g. Kazanjian et al., 2000). Prior research often focuses on individual-level creativity (e.g. Mack and Landau, 2015; Taggar, 2002), though some scholars go beyond it to the team (e.g. Chang, 2011; Cheng and Yang, 2014; Hoegl and Parboteeah, 2007; Kratzer et al., 2008) or organizational (Amabile, 1988) levels. For example, at an organizational level, creativity appears linked to the technology life cycle and types of activity, such that the seed and growth stages relate closely to creativity, whereas in the mature and decline stages of a technology life cycle, “productivity and commercialization are more important than creativity, where activities are highly exploitative” (Li et al., 2008, p. 118). Creativity thus appears mainly associated with exploration activities. In contrast, Audia and Goncalo (2007) identify two types of creativity: one that enhances exploratory innovation (divergent creativity) and one that favours exploitative innovation (convergent creativity). Both exploration and exploitation therefore may be associated with learning and innovation—just of different types (Benner and Tushman, 2003; He and Wong, 2004; Li et al., 2008). In an integrated innovation framework, Li et al. (2008) clarify the distinctions of various knowledge domains across the value chain and associated search dimensions. In line with this previous research on creativity and its role for exploration and exploitation activities

(Amabile et al., 1996; Audia and Goncalo, 2007; Ford, 1996) and ambidexterity (Andriopoulos and Lewis, 2010; Lin et al., 2013), we develop our first hypothesis:

H1: The higher the firm's creativity, the higher its innovation ambidexterity.

1.2. ANTECEDENTS OF CREATIVITY IN AN AMBIDEXTERITY CONTEXT

We study the enabling conditions (Glynn, 1996) that can facilitate creativity and innovation. Creativity arises from managerial incentives and from innovation activities that coexist efficiently, due to a form of integration driven by senior managers who communicate shared values and visions and demonstrate the importance of a favourable social context based on support and trust (Ghoshal and Bartlett, 1994). Top management can initiate recursive processes for organizing daily activities through appropriate management practices (Benner and Tushman, 2003), and many theoretical and empirical studies consider the conditions required to promote creativity and innovation. They often are associated with the management of work routines and the creation of appropriate teams (Bassett-Jones, 2005). Alves et al. (2007) cite six internal factors that enhance creativity and innovation: organization strategy and resource availability, new technologies, R&D intensity, organization culture and communication, organization structure, and employee motivation and involvement. These factors suggest the relevance of strategic and operational management for inducing structural attitudinal changes that can reinforce creativity and innovation (Alves et al., 2007).

In line with Gibson and Birkinshaw (2004), we focus on a specific organizational climate (Andriopoulos and Lewis, 2009, 2010; Ekvall, 1996) that features ambidexterity, such that creativity must be managed under tension. Risk taking (Ghoshal and Bartlett, 1994) and performance management (Gibson and Birkinshaw, 2004; Snell, 1992) offer relevant antecedents of creativity in a managerially paradoxical setting, such as one marked by ambidexterity.

1.2.1. Risk taking. Risk taking may be integral to creativity (see Dewett, 2007); at the very least, a climate for creativity exists when employees are willing to take risks (Tesluk et al., 1997). Flexibility,

latitude for employees, incentives for idea generation, responses to errors, change management, and the reward structure all are key factors that can favour creativity and innovation. Managers also need to adopt long-term orientations and provide autonomy to support creative activities. A risk-taking climate tolerates uncertainty within the organization (Ekvall, 1996). Analysing the effects on innovation associated with limits imposed in working environments, Amabile and Conti (1999) show specifically that encouragement and acceptance of risk taking are essential for creativity. Creativity also is encouraged by giving autonomy to employees and teams (Amabile et al., 1996), which makes it possible to take risks. Employees' willingness to take risks thus appears correlated with their creativity (Dewett, 2007). Some authors argue that risk taking and creativity are different factors explaining innovativeness (Pesämaa et al., 2013), but we predict that risk management provides an important antecedent of creativity:

H2a: In an innovation ambidexterity context, risk management correlates positively with creativity.

1.2.2. Performance management. For creativity to be efficient and lead to innovation, the firm also must exert some performance management and control. As McCarthy and Gordon (2011) illustrate, management control systems can allocate attention and resources to exploration or exploitation in an ambidextrous R&D unit. Control refers to “any process by which managers direct attention, motivate and encourage organizational members to act in desired ways to meet the firm’s objectives” (Cardinal, 2001, p. 22). Snell (1992) defines three human resource management controls: input, behaviour, and output. Input and behaviour controls are not well adapted to creativity systems, in that they restrain people’s autonomy and flexibility. However, managers can control outputs (Ouchi, 1977), such that they set targets (e.g. financial results) for subordinates to pursue but give employees “discretion in the means they use to achieve desired ends, thus decentralizing control. It does not allow them to choose goals, only the methods used to pursue established targets” (Snell, 1992, p. 296). A good example of output control is management by objectives, which “allows for some subordinate discretion, yet it provides both the incentive and responsibility for results that benefit the employing firm. Subordinates can adapt their behavior to capitalize on opportunities and avoid threats that arise unexpectedly” (Snell, 1992, p. 296). Output

controls, such as returns on investment, also establish objective criteria for performance evaluations (Hoskisson and Hitt, 1988). However, as Snell (1992, p. 296) also cautions, “since subordinates bear more risk under output control, they are likely to be risk-averse and to pursue relatively safe courses of action.”

In our framework, we investigate output controls by assessing performance management actions designed to enhance creativity. Such performance management establishes clear policies and criteria that enable employees to understand the explicated, unambiguous policies, as well as the evaluation and reward systems (Binyamin and Carmeni, 2010). Ashforth and Saks (1996) argue that formal, scheduled, consecutive institutionalized practices strengthen the connection between employees and the organization, thereby improving their work outcomes. Planning process formalization also has a generally positive effect on creativity, especially in complex tasks (Andrews and Smith, 1996). High formalization can hamper creativity though, because rigid rules and procedures restrict creative processes and informal communications during the development of novel and meaningful ideas (Amabile, 1988; Amabile et al., 1996), but performance management seems to be a necessary counterbalance to risk-taking activities. Integrating both dimensions, we therefore posit

H2b: In an innovation ambidexterity context, performance management correlates positively with creativity.

1.3. MEDIATING EFFECT OF CREATIVITY

Ambidexterity literature regards creativity as a part of a favourable organizational context; creativity literature cites a mediating role of creativity between the organizational context and new product success. In line with Im et al.’s (2013) model, in which creativity takes an intermediary role as a critical link between team dynamics and product competitive advantage, we postulate that creativity is influenced by the firm’s organizational context and that it directly enhances innovation ambidexterity. Going a step further, we test explicitly for the mediating effect of creativity on the link between context and innovation ambidexterity. Achieving innovation ambidexterity means that creativity relates to both exploration and exploitation. Studies have established that creativity, as an intangible resource, can affect organizational

performance (Bharadwaj and Menon, 2000; Im et al., 2013). When creativity applies to innovation efforts, the ideal outcomes are products that are better received in the marketplace. We propose that creativity can enhance both exploitation and exploration, and thus innovation ambidexterity, by providing new or improved products that are superior in quality and cost effectiveness, a capacity to enter new technological fields, or production processes that are more flexible. In line with the RBV, a firm's ability to accumulate creative ideas as intangible assets should enhance its innovation capability, by providing superior value to customers. Then this creativity, accumulated as organizational intelligence, should enhance the firm's ambidexterity for exploiting existing competencies and building new ones. Therefore, we predict that creativity is critical for improving ambidexterity (Im et al., 2013). Stated formally:

H3: Creativity mediates the relationship of the organizational context, in the form of (a) risk management and (b) performance management, with innovation ambidexterity.

Figure 1 contains our theoretical model.

Insert Figure 1 here

2. EMPIRICAL ANALYSIS

2.1. SAMPLE AND DATA COLLECTION

The questionnaire was pretested with 12 CEOs who did not take part in our final data collection. These CEOs either responded to the questionnaire directly or forwarded it to the most relevant general manager who also held a senior management function (e.g. head of R&D or innovation). Using the database of the Chamber of Industry and Commerce of the Rhône-Alpes region, we then sent 2000 e-mails containing questionnaires to CEOs of firms in France's Rhône-Alpes region. After two follow-up e-mails, we received 422 responses (response rate > 20%), of which 307 were valid. The responses were distributed in the following sectors: industry 45.6%, construction 2.6%, trade 8.1%, services 38.4%, and other 5.2%. The sample includes 51.8% large firms (more than 250 employees) and 48.2% small or medium-sized enterprises (SMEs).

2.2. VARIABLES AND MEASUREMENT

The measures were derived from a variety of theoretical sources. We used multiple indicators when possible to support reliability and validity tests.

2.2.1. Dependent variables. Ambidexterity in an innovation context comprises two main dimensions. We adapted two scales from He and Wong (2004); an exploratory factor analysis reveals two axes (exploration and exploitation). To check the reliability of these two empirical constructs, we calculated Cronbach's alpha values; as Table 1 shows, all these values were above the minimum threshold for the two dimensions. In line with previous research (Gupta et al., 2006), we thus found that exploration and exploitation were orthogonal, distinct dimensions. Prior literature suggests several ways to define and measure the level of innovation ambidexterity (Gibson and Birkinshaw, 2004; He and Wong, 2004; Lubatkin et al., 2006), without any clear consensus. Therefore, similar to Lubatkin et al. (2006), we tested three alternative measures of ambidexterity—that is, multiplying exploitation and exploration (Gibson and Birkinshaw, 2004), subtracting the two terms (absolute value, He and Wong, 2004), or summing them (Lubatkin et al., 2006)—and selected the model with the most explanatory power. The best model resulted from adding the exploitation and exploration dimensions ($R^2 = .561$; cf. subtraction $R^2 = .132$, multiplicative $R^2 = .437$).

2.2.2. Independent variables. Three latent variables were defined to reflect creativity and the organizational context. Creativity was measured with a scale adapted from Amabile et al. (1996). We retained two items to measure firms' creativity: creates new ideas and produces original ideas. For the two dimensions of organizational context, we used scales adapted from Ghoshal and Bartlett (1994), Benner and Tushman (2003), Gibson and Birkinshaw (2004), and Snell (1992). Specifically, three items pertained to risk management, measuring a willingness to take risks, motivation to give greater freedom to employees to take more risks, and a willingness to bear the negative consequences of risk-taking. Three other items reflected performance management, indicating whether the company has a system for evaluating individual performance and whether employees are encouraged, through rewards or sanctions,

to manage their own performance. Table 1 contains all the measures; they were ranked on five-point Likert scales, ranging from 1 (fully agree) to 5 (don't agree at all).

Table 1. Construct measurement

Dependent Variable	Items	Validity	Measure
Innovation ambidexterity (He and Wong, 2004; Lubatkin et al., 2006)	Exploration Innovation During the last 3 years, your firm was able to... 1. Introduce new product generations. 2. Offer totally new products to the market. 3. Enter new technological fields. 4. Sell to new customers on new markets.	$\alpha = .754$	Additive ambidexterity model (Lubatkin et al., 2006)
	Exploitation Innovation During the last 3 years, your firm was able to... 1. Enhance existing product quality. 2. Introduce slightly different products. 3. Make production processes more flexible. 4. Reduce production costs or consumption.	$\alpha = .652$	
Independent Variables	Items		
Creativity (Amabile et al., 1996)	Please indicate to what extent the following statements apply to your firm: 1. It creates new ideas. 2. It produces original ideas .		
Risk-taking (Ghoshal and Bartlett, 1994; Gibson and Birkinshaw, 2004)	Systems in the firm encourage employees to... 1. Be willing to take risks. 2. Consider failure as a learning opportunity. 3. Have access to resources for innovation with no certainty of success.		
Performance management (Benner and Tushman, 2003; Gibson and Birkinshaw, 2004)	Systems in the firm encourage employees to... 1. Be held accountable for their performance. 2. Be rewarded or punished based on rigorous measurement of business performance. 3. Use their appraisal feedback to improve their performance.		

We included two frequently used control variables: firm size and activity. A binary variable measured the size of the firm, such that it equalled 1 for SMEs (< 250 employees) and 0 otherwise. Firm size could affect innovation capacity, because larger firms may have more resources to engage in both types of innovation. Therefore, we expect a positive effect of firm size on the firm's capacity to be ambidextrous for innovation. For the firm's sector of activity, we used five classes (industry, construction, trade, services, other). Most studies focus on high-tech sectors or specific activities (e.g. KIBS); we seek to determine if the firm's sector of activity has an effect on the type of innovation.

3. RESULTS

The data analysis relied on partial least squares (PLS), a structural model technique that is well suited to assessing predictive relationships and building theory. In particular, PLS can model latent constructs even in non-normality conditions, which makes it particularly well adapted to smaller samples (Chin et al., 1996). This structural equation model also fits our exploratory approach, given the limited existing research on the determinants of exploration and exploration innovation. A PLS analysis involves two stages: validating the measurement model and assessing the explanatory and predictive power of the structural model. We also performed two analyses to determine whether creativity had a mediating effect in the model.

3.1. RELIABILITY AND VALIDITY

We first examined the measurement model for convergent and discriminant validity (Gefen and Straub, 2005). Convergent validity exists when items measuring a latent variable load with significant t-values on that construct. All items loaded significantly on their hypothesized constructs, indicating adequate convergent validity.¹ The model also showed convergent validity, in that the average variance extracted (AVE) of all constructs was above the recommended threshold of .5 (Table 2). The construct measures had adequate internal consistency, because all composite reliabilities were greater than the recommended level of .70.

Table 2. Reliability and Average Variance Extracted

Construct	Composite Reliability	AVE	Cronbach's Alpha
Creativity	.958	.919	.912
Performance Management	.868	.688	.792
Risk Management	.863	.681	.769

¹ These results are available on request.

We used the factor loadings and cross-loadings to examine discriminant validity, which requires the items to load strongly on their theoretically assigned factors, not on other factors in the model. Table A1 in the Appendix shows that all the constructs had loadings above .60, with no high cross-loadings on the other constructs. In support of discriminant validity, Table A2 in the Appendix reveals that the square root of the AVE for any given construct was greater than the correlation between that construct and any other constructs in the analysis. Thus we have evidence of adequate construct validity and reliability.

This data collection process can induce common method bias, so we randomized many of the construct items and conducted a *post hoc* analysis, using Harmon's one-factor test for all items (Podsakoff and Organ, 1986). No single factor emerged, and no one factor accounted for most of the variance, which increases confidence that common method bias was not an issue.

3.2. STRUCTURAL MODEL RESULTS

We propose two synthetic representations of the PLS estimation results (Table 3). The model estimations show that creativity has a very strong influence on innovation ambidexterity ($\beta = .728, p < .001$), thus confirming H1. Furthermore, firm size influences innovation ambidexterity ($\beta = .098, p < .05$), but sectors demonstrate no significant effect on innovation ambidexterity ($\beta = .015, ns$).

Table 3. PLS Estimations

Control variables → Innovation ambidexterity	β
SME	.098
Sector	.015
Creativity → Innovation ambidexterity (H1)	.728***
Organizational context → Creativity	
Risk management (H2a)	.484***
Performance management (H2b)	.316***
R² Innovation ambidexterity	.561
R² Creativity	.477

* $p < .05$; ** $p < .01$; *** $p < .001$ (based on $t_{(4999)}$ two-tailed test).

The structural model seeks to highlight the explanatory power of risk management and performance management, as two dimensions of the organizational context, on creativity. These results show that risk

management ($\beta = .484, p < .001$) and performance management ($\beta = .316, p < .001$) both support creativity, in support of H2a and H2b. To test H3, we also need to calculate mediation effects.

3.3. TESTING CREATIVITY AS A MEDIATOR

On the basis of the results from the structural model test, we explored mediation along two paths: (1) from risk management to innovation ambidexterity and (2) from performance management to innovation ambidexterity. To establish mediation, the following conditions must be satisfied (Baron and Kenny, 1986):

- The independent variable must affect the mediator (first regression).
- The independent variable must affect the dependent variable (second regression).
- When regressing the independent variable and the mediator on the dependent variable, the mediator must affect the dependent variable (third regression).
- If all of these conditions are satisfied in the predicted direction, the effect of the independent variable on the dependent variable must be less in the third regression than in the second.

Full mediation holds if the independent variable has no effect in the third equation; partial mediation exists if the effect of the independent variable on the dependent variable in the third equation is less significant than in the second equation. As columns 3, 5, and 7 in Table 4 indicate, all the paths meet all of these mediation conditions. Full mediation thus is observed for the risk management dimension, and partial mediation appears for the performance management dimension of the organizational context.

Table 4. Mediation Results

	Baron and Kenny's Test						Sobel	
	First condition		Second condition		Third condition		Type of mediation	z-test
	Path: a → b → c a → c	Valid.	a → c	Valid.	a → c	Valid.		
Risk mgt (a) → Crea (b) → Inno ambi (c)	.634***	Yes	.486***	Yes	.755** .034	Yes	Full <i>p</i> < .001	
Perf mgt (a) → Crea (b) → Inno ambi (c)	.544***	Yes	.524***	Yes	.654*** .159***	Yes	Partial <i>p</i> < .001	

* *p* < .05; ** *p* < .01; *** *p* < .001 (based on $t_{(4999)}$ two-tailed test).

We also performed a second test, to determine if the intervening variables carried the effects of the independent variable to the dependent variable (Sobel, 1982). The Sobel test is an approximate significance test for the indirect effect of the independent variable on the dependent variable through the mediator. Significant t-values indicate that the intervening variable is an important mediator. As the last column of Table 4 shows, this test is significant for both paths. In brief, the results support our theoretical argument that creativity plays a mediating role in the link from the organizational context to innovation ambidexterity, in support of H3.

4. DISCUSSION AND CONCLUSION

Our research adds to existing literature on creativity and ambidexterity. With a quantitative analysis of 307 firms established in the French Rhône-Alpes region, we provide several theoretical contributions to both these streams of research.

First, we clarify the type of organizational context that favours creativity. The finding that risk taking encourages a creative organizational climate is not new (e.g. Dewett, 2007; Tesluk et al., 1997), but previous studies do not account for the antecedents of creativity in a context marked by tension and paradoxes, as occur in innovation settings. Nor has prior research explicitly considered that creativity might be driven by more than managerial incentives for risk taking, autonomy, or freedom. With this study, we reveal that creativity also needs to be controlled with performance management systems if it is

to lead to innovation ambidexterity. This result is not surprising; other authors suggest the need for firms to align contradictory objectives and achieve ambidexterity. Gil and Spiller (2007) study the dilemma between artistic aspirations (creativity) and managerial operational necessities (profitability, market coherence, performance objectives). Tschang (2007) also advises firms to balance the tensions between rationalization (necessity of routines, performance objectives) and creativity (freedom, flexibility). The need for output control (Snell, 1992) demonstrates that objectives should be set for employees, who cannot be left totally free to indulge their creativity and innovation. Companies do not take risks or encourage creativity with absolutely no guarantee of return. Rather, the risks taken by companies might be calculated, or exploration innovation projects might not be based on new skills. This finding also resonates with recent research on the relationship between leadership and ambidexterity, which shows that a flexible leadership style is required (Rosing et al., 2011). The paradoxical situations created by ambidexterity require temporal flexibility between opening leadership behaviour (i.e. encouraging experimentation, motivating to take risks, giving room for own ideas, allowing errors, encouraging learning) and closing leadership behaviour (monitoring and controlling goal attainment, controlling adherence to rules, sanctioning errors, sticking to plans).

Second, creativity is linked to different types of innovation (exploitation/exploration). If this finding appears not very original, the results belie the conventional wisdom that these links are "obvious." Creativity has a very positive, significant effect on both exploration and exploitation forms of innovation. This result encourages a deeper view of the concept of creativity that acknowledges the continuum it spans, from incremental to divergent creativity (Audia and Goncalo, 2007). In line with prior creativity studies, we find that creativity is slightly more favourable to exploration innovation than to exploitation innovation, though both links are statistically significant and strong. Audia and Goncalo (2007) identify two types of creativity: incremental creativity, which corresponds to the improvement of knowledge and existing ideas, and divergent creativity, whose objective is to break with existing ideas and knowledge. Then they indicate that on the organizational level, exploration and exploitation concepts (March, 1991)

are directly comparable with divergent and incremental creativity, and they provide evidence of an isomorphic relationship between the individual and organizational levels. These two types of creativity can be observed in the firms in our sample, on the same continuum, without being clearly distinguished.

Third, we identify a mediating role of creativity in a context of managerial tension, due to innovation ambidexterity. Contributing to both creativity and ambidexterity literature, our research shows that creativity is more than just a contextual element. It is the missing variable between two antagonistic contextual elements (risk taking and performance management). Taking risks and managing performance are antecedents of innovation, but they are more effective when we take creativity into account. However, these mediating effects differ according to the independent variable being considered. The mediating effect is full for risk management but only partial for performance management. Therefore, performance management influences both creativity and innovation. For risk management, models linking it to innovation appear underspecified, because the key variable of creativity is missing, so they likely suffer an estimation bias. Our model supports better estimates of the effect of risk on creativity, as well as, through the mediation effects, on innovation.

5. LIMITATIONS AND AVENUES FOR RESEARCH

Our research is not exempt from limitations. In particular, we restricted the organizational context to two variables: risk taking and performance management. Risk taking has been studied extensively, mostly as an antecedent of innovation. We show that models addressing this direct effect are underspecified. Performance management might be even more interesting, in that it challenges the conventional notion that creativity should suffer no constraints whatsoever. We uncover the interesting result that creativity, without performance management and clearly defined objectives, leads to negative effects. Many other variables related to the organizational context also should be considered, such as trust and support (Ghoshal and Bartlett, 1994), flexibility and autonomy among employees and teams (Amabile et al., 1996), and so on. More refined measures of organizational context variables also could be developed to obtain a more complete view of organizational contexts that favour creativity.

Another limitation is inherent to our sample; because of its size and composition, it can only be regarded as representative of the French Rhône-Alpes region. Further research on larger and different samples should be conducted to confirm the results we obtained here. Additional studies also are needed to examine the complementarity of various management practices and dimensions of the organizational context, such as risk taking and performance management. A lot remains to be done to explore the links of creativity with various types of innovation and to assess the potential impact of the organizational context on both creativity and innovation. It might be particularly interesting to assess whether the organizational context variables directly affect innovation or are related to creativity.

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Figure 1. Theoretical Model

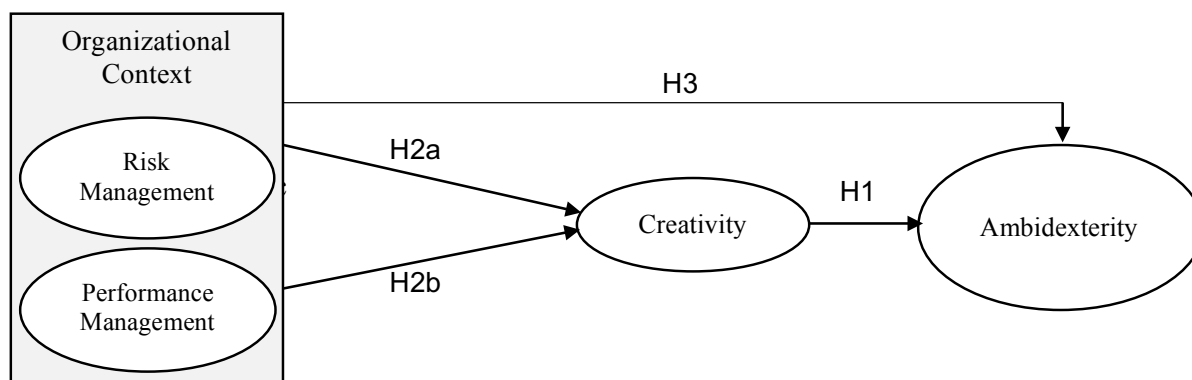


Table A1. Factor Structure Matrix of Loadings and Cross-Loadings

Items	Crea	Inno Ambi	Perf Mgt	Risk Mgt	SME	Sector
EXPERI_1	0.9582	0.5943	0.4953	0.6396	0.1135	0.0419
IDEAS_1	0.9590	0.6285	0.5452	0.5719	0.1443	0.0564
AMBI_PL	0.6422	1.0000	0.4973	0.4447	0.1976	0.0656
OBJECT_1	0.5059	0.5343	0.8789	0.3872	0.2508	-0.0294
SANC_Rec	0.1633	0.0789	0.6977	0.2168	0.0685	-0.0227
APREC_Pe	0.5257	0.4354	0.8961	0.4774	0.0982	0.0157
RESOU_1	0.3144	0.1357	0.2030	0.6609	0.0214	0.0484
RISK_1	0.6221	0.4973	0.4798	0.8882	0.1146	-0.0055
FAIL_1	0.5620	0.3776	0.4129	0.9049	0.0176	0.0199
PME	0.1345	0.1976	0.1843	0.0693	1.0000	0.1373
SECTOR	0.0513	0.0656	-0.0100	0.0181	0.1373	1.0000

Table A2. Means, Standard Deviations, and Interconstruct Correlations

	Mean SD	Crea	Inno Ambi	Perf Mgt	Risk Mgt	SME	Sector
Crea	3.435 1.906	0.959					
Inno Ambi	6.261 3.286	0.6422	1.0000				
Perf Mgt	3.672 1.752	0.5428	0.4973	0.830			
Risk Mgt	3.849 1.797	0.6318	0.4447	0.4684	0.826		
SME	0.482 0.500	0.1345	0.1976	0.1843	0.0693	1.0000	
Sector	2.550	0.0513	0.0656	-0.0100	0.0181	0.1373	1.0000

1.499

Notes: The square root of the AVE is on the diagonal.