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Thinking outside the boss : understanding managers' engagement in creative actions = Sortir du cadre : comprendre l'engagement des managers dans des actions créatives

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# Thinking outside the boss : understanding managers' engagement in creative actions

Justine Massu

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# Université Paris Descartes

**ED 261: Cognition, Comportements, Conduites Humaines**

*Laboratoire Adaptations Travail - Individu*

## Thinking outside the boss:

*Understanding managers' engagement in  
creative actions*

By Justine Massu

A thesis submitted in fulfillment of the requirements for the degree of  
Doctor of Philosophy in Psychology

Written under the direction of Professor Todd Lubart

Presented and publicly defended on November 20<sup>th</sup>, 2017

CIFRE Contract N° 2014/0928

Supervisory committee:

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**Peiró, José Maria**, Professor, Examiner

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**Leclerc, Olivier**, PhD, Committee member



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*Comprendre l'engagement des managers  
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**Par Justine Massu**

Thèse de doctorat de Psychologie

Dirigée par le Professeur Todd Lubart

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# Summary

## **English version**

In 2010, 1,500 Chief Executive Officers identified managers' creativity as the most crucial factor for future organizational success. However, managers' engagement in creative actions is constantly competing with routine behaviors that implied less risk taking, uncertainty and possibility of failure. This dissertation explores three potential avenues to study and understand managers' decision to engage in creative actions. The first one focuses on managers' conceptions of creativity and innovation as antecedents of their own creative behaviors and their evaluation of creative managers and managerial practices. The second avenue evidences that creative actions result from a decision-making process that evaluates the relevance of creativity in specific situations and takes into account individual predispositions and organizational characteristics. The third avenue investigates the extent to which a fit or misfit between managers and their organizations can trigger creative behaviors. This thesis reaffirms the relevance of the multivariate and interactionist approaches to organizational creativity. It also stresses the importance of considering managers' evaluation of the appropriateness and effectiveness of specific creative actions in specific situations. Finally, most research tends to conceive that managerial creativity emerges from positive and encouraging circumstances. Rather, the present research highlights that managerial creativity can emerge as a response to situations of misfit and dissatisfaction.

## **French version**

En 2010, 1 500 chefs d'entreprise ont identifié la créativité des managers comme le facteur le plus important pour les réussites futures des organisations. Cependant, l'engagement des managers dans des actions créatives est en constante concurrence avec des comportements de routine qui impliquent moins de prise de risque, d'incertitude et de possibilité d'échec. La thèse présente trois axes de recherche pour étudier et comprendre la décision des managers de s'engager dans des actions créatives. Le premier se concentre sur la façon dont les managers conçoivent la créativité et l'innovation lorsqu'elles s'appliquent à leur activité. Il étudie aussi la façon dont les conceptions des managers peuvent influencer leurs propres comportements créatifs et leur évaluation de pratiques managériales et de managers créatifs. Le second axe montre que les actions créatives résultent d'un processus décisionnel qui évalue la pertinence de la créativité dans des situations spécifiques et prend en compte les prédispositions individuelles ainsi que les caractéristiques favorables de l'organisation. Le troisième axe établit comment la complémentarité ou l'inadéquation entre les caractéristiques des managers et de leurs organisations peuvent déclencher des comportements créatifs. Les conclusions de cette recherche réaffirment l'intérêt des approches multivariées et interactionnistes de la créativité dans les organisations. Elles soulignent également l'importance de considérer l'évaluation, par les managers, de la pertinence et de l'efficacité d'actions créatives dans des situations de travail spécifiques. Enfin, la plupart des recherches tendent à concevoir que la créativité émerge de circonstances positives et encourageantes. Au contraire, la présente recherche atteste que les managers sont amenés à adopter des comportements créatifs dans des situations de travail qui ne sont pas optimales et satisfaisantes.

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# Introduction

“In a world swarming with new management challenges, you’ll need to be even more inventive and less tradition bound than all those management pioneers who came before you”. These words of Hamel (2006, p.11) concluded his statement on organizations’ use of outdated managerial practices and on the consequent necessity for management innovation. In the same vein, Deslandes (2016) noted that Taylorism, a theory that defines managers as the holders of knowledge and authority, and as controllers of collaborators’ behaviors, is still used too often in current organizations despite its ineffectiveness (Babeau & Chanlat, 2008; Senior & Fleming, 2006; Walton & Parikh, 2012). Indeed, in most organizations that can be regarded as bureaucratic structures, managers are still supposed to guarantee the consistency, efficiency, and control of employees’ behaviors; which prevent managers from expressing creativity (Adler, 1999; Hirst, Van Knippenberg, Chen, & Sacramento, 2011; Kingston, 1995). Similarly, Goshal (2005) reported the deleterious effects of the application of certain management theories on managers’ functioning. One explanation proposed by this author focuses on the uniformity of the theories taught in management schools and the tendency of these theories to free managers from ethical responsibilities regarding their roles and the effects of their practices (*ibid.*). Overall, these scholars highlighted that traditional management practices may cause deleterious effects and are not questioned sufficiently.

As one plausible consequence, employees’ well-being and their relationship with management have deteriorated considerably in recent years (Eurofound, 2016; International Labour Office, 2015). A survey on well-being at work conducted by Eurofound (2016) established this finding within French organizations. Of the 28 countries in Europe, France ranks in the bottom third on welfare at work and in the first third on labor intensity (e.g., quantitative and emotional requirements). French workers report the most experiences of unfavorable social behaviors (e.g., humiliation, verbal abuse, threats) and the least support from management (e.g., respect, recognition, quality of the manager's work for the cohesion of the team and individual well-being and effectiveness; Eurofound, 2016). French employees state that the main causes of stress at work are the lack of solidarity of the supervisor when complicated situations arise and a poor organization of work. In response to this stress, the hierarchical supervisor is the last person with whom they confide (ANACT, 2009). Employees now expect their managers to question and improve their practices (Gordon, Gilley, Avery, Gilley, & Barber, 2014). They no longer wish to be satisfied with traditional

management, sometimes rigid and authoritarian and they consider that the manager must allow them to surpass themselves, recognize them, and defend them (*ibid.*).

Conscious of this situation, hundreds of organizations in France started to question the legitimacy of management positions (Carney & Getz, 2009; Getz, 2009). Isaac Getz (2009) identified, studied and grouped these kinds of organizations under the term of initiative-freeing form of organizations (F-form). Among these organizations, Gore, Toyota, Avis, IDEO or Harley-Davidson are some of the most frequently cited examples. These organizations have in common that “employees have complete freedom and responsibility to take actions that they, not their bosses, decide are best” (Getz, 2009, p.34) and that liberating leaders took, at one point, the decision to question and radically change the current organizational and managerial practices. In some of these organizations, the position of management even disappeared because it was perceived as unnecessary or even stifling employees’ freedom (Carney & Getz, 2009). In most existing organizations, these practices seem impossible to implement and even appear as fatal for the effective operation of the business. However, in every organization, leaders should be able to question the traditional practices and adopt managerial practices that are best suited to their situations and teams.

Such ability to question managerial practices and suggest improvements refers to *managerial creativity*. Twenty years ago, Sternberg (1997) already postulated the importance of managerial creativity in order to adapt to the rapid changes that organizations face. Ghoshal (2005) noted that managerial practices in organizations would only be optimal if managers are given the opportunity to demonstrate personal initiatives. Getz (2009) identified creativity as one of the three main traits of successful liberating leaders, together with freedom and responsibility values, and wisdom. At the same time, numerous scholars investigated managerial creativity as a necessary factor to ensure organizations’ competitiveness, successful changes, as well as management, organizational and technological innovations (e.g., Gebauer, 2011; Hamel, 2006, 2007; Mol & Birkinshaw, 2006; Walker, Chen, & Aravind, 2015).

Scholars’ increasing interest in managerial creativity seems to echo executives’ considerations. Indeed, in a survey conducted by IBM, more than 1,500 Chief Executive Officers identified that leaders’ creativity was the most crucial factor for future organizational success as it constitutes the trigger for managerial innovation (IBM Institute for Business Value, 2010).

However, if researchers and executives have called for managerial creativity, it does not seem to reflect leaders' behaviors. Indeed, Nutt (1984) conducted in-depth interviews with project managers in several organizations to identify the sequences of decision activities. His results showed that only 15% of the respondents reported activities where new ideas were sought with the intent of creating an innovative project. From this result, Ford and Gioia (2000) stated that "instead of generating potentially creative alternatives, managers usually adopt well understood, previously successful options" and concluded "managers rarely concern themselves with creativity during their day-to-day decision making activities" (p.709). More recently, Basadur and Basadur (2011) reported as well the managers' tendency to implement existing practices rather than to express creativity. Thus, the principal impetus for managerial creativity does not seem to originate from leaders' low performance or failure when they engage in creative efforts, but lies in their reluctance in the first place to express creativity as a way to improve their managerial practices.

Yet, most research on managerial creativity focused on creative performance rather than managers' engagement in creative efforts. These studies highlighted the influence of individual predispositions and organizational factors on managers' creative performance (e.g., Caroff & Lubart, 2012; Myszkowski, Storme, Davila, & Lubart, 2015; Scratchley & Hakstian, 2001). Findings suggest that leaders are more creative when they have the necessary predispositions and evolve in supporting organizations. Relying on these results, we can identify what would make a manager more effective if he/she decided to engage in creative actions. However, research is still needed to understand what makes managers decide to act creatively instead of routinely. The present thesis attempts to elucidate some of the antecedents and processes leading managers to engage in creative actions, independently from the successfulness of the outcome. Following this objective, we organized this thesis in seven chapters.

A first chapter will discuss the definitions and distinctions of the concepts of management, leadership, creativity and innovation. In the second chapter, we will present the theoretical foundations of our work. Research tends to apply and contribute to either the creativity or the innovation field of research (Anderson, Potočník, & Zhou, 2014). Thus, we will attempt to integrate the different perspectives on creativity and innovation in a comprehensive way. More precisely, we will outline theories that stressed the importance of adopting an individual perspective to study management innovation, considering individual and organizational

antecedents of managerial creativity, and focusing on managers' engagement in creative actions rather than their performance.

Within this specific scope, we conducted a literature review from which we identified that the antecedents of managers' reluctance toward creative actions could reside in (a) their negative a priori stance toward creativity; (b) their tendency to opt for ready-made, routine responses to everyday problem solving, and (c) their fit within the broader organizational context. These three potential hindering circumstances have been underpinned by empirical studies that are presented in Chapter 3. They constitute the three avenues of research that we intend to address empirically in the present research.

The first avenue focuses on managers' conceptions of creativity in their work. Research on implicit leadership theories acknowledged the "striking absence" of the creative feature (Epitropaki & Martin, 2004). Indeed, to this day, creativity has never been mentioned as a prototypical characteristic of an effective leader. Moreover, Mueller, Goncalo, and Kamdar (2011) postulated that stereotypes of a creative person and of an effective leader might be partially antagonistic. They noticed that the expression of creative ideas in organizations is negatively related to the perception of managers' leadership potential. However, managers' engagement in creative actions is less likely to occur unless creativity entails positive beliefs (Ajzen & Fishbein, 1980; Basadur & Finkneiner, 1985; Basadur, Runco, & Vega, 2000). Mueller et al. (2011) concluded by pointing out the potential negative bias against managerial creativity and the lack of understanding of how executives and managers conceive managerial creativity and innovation, and how they characterize creative managers. Across three studies that are presented in Chapter 4, the first empirical part of this thesis contributes to provide some elements of answer to this lack of understanding. Study 1 investigates leaders' implicit theories of creativity and innovation in relation to managerial practices. Study 2 focuses on leaders' implicit theories of the characteristics of a creative manager. Study 3 examines the relationship between leaders' implicit theories and their judgments and behaviors in relation to creativity.

The second avenue examines managers' engagement in creative behaviors as a result of their assessment of individual and organizational characteristics. Two studies are presented that pertain to this issue. In Study 4, we rely on the work of Basadur and Basadur (2011) demonstrating that the lack of creativity in management practices originated from managers' lack of familiarity with the different steps composing creative problem solving and essentially the step of idea generation. We led managers to experience sequentially an idea generation

and an idea selection phase in a management problem solving. Then, we investigated the influence of cognitive and conative predispositions, as well as organizational characteristics on managers' sensemaking process to solve problems creatively in their daily activities. Subsequently, Study 5 focuses on managers' decision to engage in creative behaviors in response to a specific situation. We confronted managers with the hypothetical situation of telework implementation that is supposed to require them to adapt their practices, and we investigated how individual and organizational characteristics influence the sensemaking process leading to managers' intentions to innovate as a response to the situation. These two studies are presented in Chapter 5.

The third avenue examines how the correspondence between leaders and their organization's characteristics affect leaders' adoption of innovative behaviors. Little research has questioned whether creative behaviors emerge from a complementarity or a discrepancy between the characteristics of an individual and his/her environment (e.g., Afsar, Badir, & Khan, 2015; Jin Nam Choi & Price, 2005; Jones, Svejnova, & Strandgaard, 2011). This research issue seems all the more appropriate to managerial creativity because this kind of creativity consists of questioning organizational practices while at the same time imposes that managers' new ideas need to be validated and supported by the organization (Birkinshaw, Hamel, & Mol, 2008; Damanpour & Aravind, 2011). Therefore, two studies have been conducted on this research question and are presented in Chapter 6. Study 6 investigates the effects of the adequacy between leaders' needs for specific characteristics of the organizational climate and organizational supplies of the corresponding characteristics. Study 7 considers the discrepancy between organizational and leaders' values guiding managerial practices as a potential antecedent of leaders' innovative behaviors.

Finally, Chapter 7 discusses the contributions of the present research, the limits of our approach and the avenues for further research. In doing so, we attempt to respond to the recent call for gaining insights into "the different ways and mechanisms in which actors and context interact to affect creativity and innovation" (Ramos, Anderson, Peiró, & Zijlstra, 2016, p. 477). More precisely, we wish to contribute to a better understanding of the potential triggers of leaders' decision to adopt creative and innovative behaviors.

# Chapter 1: Managerial creativity and innovation

The present thesis approaches concepts that can be seen as overlapping or synonyms, such as *management* and *leadership*, or *creativity*, *innovation* and *change*. This first chapter attempts to clarify these concepts and their relationship.

## Definitions

### Management and leadership

The debate on similarities and differences between management and leadership has been subject to numerous studies (e.g., Algahtani, 2014; Kotterman, 2006; Lopez, 2014; Pavur, 2012; Toor, 2011; Toor & Ofori, 2008; Turk, 2007). For some scholars, management and leadership are completely different concepts (e.g., Kotterman, 2006; Zaleznik, 1977). For others, management and leadership can be conceived in opposition (Algahtani, 2014; Toor, 2011; Toor & Ofori, 2008). But most scholars argue that the two concepts are related in different ways and at different levels (Goleman, 2000; Turk, 2007; Yukl, 1989). For example, Puccio, Murdock and Mance (2007) consider that leadership differs from management notably because it implies the expression of creativity. As noted by Toor and Ofori (2008) and Offerman, Kennedy and Wirtz (1994), despite the considerable efforts to highlight that management and leadership are not interchangeable, most experimental studies that contribute to the organizational leadership literature rely on individuals in management positions (e.g., Basu & Green, 1997; Bommer, Rubin, & Baldwin, 2004; Sarros, Cooper, & Santora, 2008). Thus, the boundary between management and leadership is tenuous and most studies on leadership still consider that managers are in the best position to express leadership.

The main differences seem to actually lie in how scholars make use of both terms. Indeed, “management” is often used to describe a function and its objective. For example, Daft (2003) defines management as “the attainment of organizational goals in an effective and efficient manner through planning, organizing, leading, and controlling organizational resources” (in Toor & Ofori, 2008, p. 64). In contrast, the term “leadership” is applied to study the traits,



abilities and behaviors of people in organizations “influencing and facilitating individual and collective efforts to accomplish shared objectives” (Yukl, 2012, p. 66).

As a matter of fact, individuals with influence in organizations are mostly found in management positions. As acknowledged by Toor and Ofori (2008), “in practice, many managers perform the leadership role, and many leaders do manage” (p.62). Such a statement does not imply that members of organizations who are not in management position cannot influence their colleagues, or even their superiors, but we believe that every person in a management position is required to express leadership, in terms of influence. In the same vein, Goleman (2000) stated that managers could exert different leadership styles as a result of a strategic choice rather than an inherent function of personality. In the present research, we posit that management is a function implying numerous activities and behaviors. Among these activities, some are closely related to leadership as they involve engaging in close relationships with others and driving changes in organizations. Taxonomies of management and leadership activities will be presented shortly thereafter. Thus, we will mostly refer to creativity and innovation applied to managerial activities rather than leadership, as this last constitutes a broader category.

In the present document, the terms “leader” and “manager” will be used interchangeably to designate individuals, as did Boyatzis (2011) for example. To us, both expressions refer to individuals who are a) in a management position within an organization, and b) expected to adopt behaviors that aim to influence the performance and well-being of their team and the organization as a whole. Other related terms can be found in the literature such as hierarchical superior or supervisor, and the French language has even more terms to designate individuals in organizations who have responsibilities toward a team such as “cadre”, “dirigeant” or “gestionnaire”. Even though no research, to our knowledge, has demonstrated any cultural difference on the way the term leader is used, we perceived that individuals in French organizations refer mostly to the term “manager” to designate individuals in management position and to the term “leaders” to designate the emblematic figures that have been recognized for their effectiveness in leadership (e.g., Elon Musk, CEO of SpaceX; Steve Jobs, CEO of Apple; Richard Branson, CEO of Virgin). Because the present research has been conducted in France, surveys were in French and only used the term “manager”.

## Management and leadership behaviors

In organizations, management positions entail numerous responsibilities, activities and subsequent behaviors and competences. Several scholars proposed taxonomies of such behaviors (e.g., Pavur, 2012; Tett, Guterman, Bleier, & Murphy, 2000; Yukl, 1989, 2012; Yukl, Gordon, & Taber, 2002; Yukl & Van Fleet, 1992). Focusing on “managerial leadership” (Yukl, 1989, 2012) or “leadership for managers” (Pavur, 2012), Yukl and Pavur agree on most broad categories of management activities. The activities that both identified are *task-oriented* (e.g., planning, organizing, problem solving), *relations oriented* (e.g., supporting, empowering, recognizing) and *external* (e.g., networking, representing). Moreover, Yukl (2012) suggested also a broad category *Change-oriented* (e.g., advocating, envisioning and encouraging change), whereas Pavur (2012) added a category *Achievement* (managing conflicts, building and developing teams). Tett et al. (2000) developed a hyper dimensional taxonomy of managerial competencies. From a literature review, they identified 141 managerial behaviors that applied 53 competencies. They grouped the 53 competencies under 10 categories: *Traditional functions* (e.g., decision-making, strategic planning), *Task-orientation* (e.g., initiative, task focus), *Person orientation* (e.g., compassion, sociability), *Dependability* (e.g., orderliness, rule orientation), *Responsibility* (e.g., trustworthiness, professionalism), *Open mindedness* (e.g., adaptability, creative thinking), *Emotional control* (resilience, stress management), *Communication* (e.g., oral and written communication), *Developing self and others* (e.g., performance assessment, job enrichment) and *Occupational acumen and concerns* (e.g., job knowledge, quality concern). As we can appreciate, Tett et al. (2000) are the only ones that highlighted creative thinking as an expected competency of an effective manager. However, these authors did not define what they mean by creative thinking. Moreover, as they present how creative thinking encompasses competencies that have been highlighted in previous taxonomies, we notice that the category contained disparate competencies that are not exclusively related to creativity such as *proficiency in military occupation, formulating problems and hypotheses* or *initiating long term planning*. Such heterogeneity of competencies included under the term *creative thinking* does not, in our opinion of view, reflect appropriately the relationship between creativity and management. Therefore, the next section will discuss the concepts of creativity and innovation in the context of management activities.

# Creativity and innovation

## Managerial creativity

Managerial creativity was defined by Scratchley and Hakstian (2001) as “the production by a manager of new concepts, ideas, methods, directions, and modes of operation that are useful to the organization” (p.367). This definition includes the essential elements of the definitions of creativity (see Table 1 for examples): an individual produces something that can be called new (original, atypical) and useful (adapted, appropriate). Definitions of creativity can vary, but most scholars found a consensus regarding these essential features.

*Table 1. Definitions of creativity*

Individual perspective	"the production of novel and useful ideas by an individual or small group of individuals working together." (Amabile, 1988, p. 126)
	“the creative person has novel ideas. The degree of novelty of which the person is capable, or which he habitually exhibits... can be tested in terms of the frequency of uncommon, yet acceptable, responses to items” (J. P. Guilford, 1950, p. 452)
	“the ability to produce work that is both novel (i.e., original, unexpected) and appropriate (i.e., useful, adaptive concerning task constraints)” (Sternberg & Lubart, 1999, p. 3)
Processual perspective	"a process influenced by individual and organizational factors and results in the production of novel and valuable ideas and/or products” (Livingstone & Nelson, 1994, p. 244)
	"a process extended in time and characterized by originality, adaptiveness, and realization." (Mackinnon, 1962, p. 485)
	“Doing something for the first time anywhere or creating new knowledge” (Woodman, Sawyer, & Griffin, 1993, p. 293)
Product perspective	“any act, idea, or product that changes an existing domain, or that transforms an existing domain into a new one,” (Csikszentmihalyi, 1996, p. 28)
	"Acts are judged to be creative when they produce something that is novel and that is thought to be interesting or to have social value." (Simon, 1986, p. 68)
Organizational creativity	"the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social system." (Woodman et al., 1993, p. 293)

	"an ability to harvest novel yet appropriate ideas in order to increase organizational efficiencies, solve complex problems and improve overall effectiveness" (DiLiello & Houghton, 2008, p. 37)
	"the production of high quality, original, and elegant solutions to problems." (Mumford, Hester, & Robledo, 2012, p. 4)
	"having the freedom and the ability to question new information against old rules or assumptions and then to revise these rules and assumptions when the former no longer work." (Pech, 2001, p. 566)
Managerial creativity	"Creative management is the study and practice of management, drawing on the theories of creative processes and their application at individual, group, organizational and cultural levels." (Xu & Rickards, 2007, p. 217)
	"Innovative or creative managers solve problems in untested ways that may appear to be risky and may cause unwelcomed ripple effects." (Koberg & Chusmir, 1987, p. 398)

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For Scratchley and Hakstian (2001), creativity is *managerial* only if a manager expresses it. In our case, we want this particularity to be reflected in the individual but also in the production he/she generates. Concerning this production, the authors evoke practices, ideas, methods, instructions and modes of operation. The distinction between these different terms seems confusing. In addition, all the practices, methods, instructions and modes of operations that managers can propose derive primarily from their ideas. Thus, the term idea can be self-sufficient if it is contextualized within the managerial activity.

On the other hand, the most frequent way for managers to express creativity is to propose solutions that address problems in their activities (Mumford & Connelly, 1991). Based on certain definitions of creativity (e.g., DiLiello & Houghton, 2008; Mumford et al., 2012), it seems relevant to specify that managerial creativity can result in the production of ideas for improvements or solutions to problems relating to managerial activity. By activity, we refer to every endeavor that requires managers to adopt the behaviors or exert the competencies that have been presented in the previous section.

Moreover, to complete our definition of managerial creativity, we must add the two main criteria of creativity: novelty and adaptation. Without any specification, the use of these terms leaves an important place to interpretation. New for whom? Adapted to what? Several scholars have attempted to define these terms or to study the extent to which ideas or productions need to be original and adapted in order to be considered creative (e.g., Litchfield, Gilson, & Gilson, 2015; Long, 2014; Runco & Jaeger, 2012). Moreover, we

conceive managerial creativity in line with what Kaufman and Begetto (2009) describes as "little-c" creativity but applied to the professional domain. In other words, in the present thesis, creativity does not concern the completion of big works ("big-c"), or does not imply that managers attained an expert-level on creativity ("pro-c"); in contrary, creativity can be expressed on a daily basis in activities by managers who are not creative experts. In the present research, we will consider that an idea or solution can be considered creative if it is new to the manager who suggests it. Similarly, an idea may be considered appropriate if it allows any improvement in the activity of the manager or his team. In such perspective, we follow Mumford and Gustafson (1988) who stated that creativity ranged from minor adaptations to radical breakthrough. Going further, Sternberg, Kaufman and Pretz (2004) assumed that leaders can even exert creativity in order to find ways to convince of maintaining the status quo if the latter is questioned and needs to be reaffirmed.

Finally, several definitions of creativity state that the production of creative ideas results from a process (e.g., Livingstone & Nelson, 1994; Mackinnon, 1962; Woodman et al., 1993). The process refers to the actions in which the individual engages to pursue a creative goal (Corazza, 2016). These actions can be seen as a set of creative behaviors (George & Zhou, 2001, 2002; Oldham & Cummings, 1996). Because the objective of this research is precisely to study managerial creativity from a behavioral perspective, it is fundamental to include a reference to this creative process in the definition we are going to suggest.

In line with our research objectives and considering all the above stated nuances, we propose to define managerial creativity as: **the actions in which a manager engages in order to produce ideas or solutions that he/she conceives to be original and which are aimed to improve the way he/she performs an activity.**

## Managerial innovation

Creativity and innovation are sometimes used as interchangeable terms (e.g., Anderson, Potočník, et al., 2014; Scott & Bruce, 1994). Yet these two concepts differ in several respects. First, creativity and innovation seem to contrast in the degree of novelty and usefulness. Concerning novelty, if creativity necessarily evokes the production of new solutions, innovation may consist of creating ex nihilo, or simply of adopting and adapting within an organization a practice that is known to be implemented elsewhere (Anderson, De Dreu, & Nijstad, 2004; Rank, Pace, & Frese, 2004). In this case, the practice will be new to the organization but unlike creativity, there will be no intention to create a new practice in itself.

On the other hand, creativity concerns ideas intended to improve the current situation, whereas innovation implies that the significant and positive impact of the idea has already been demonstrated within an environment (Damanpour & Aravind, 2011; Hamel, 2006; Kimberly, 1981).

Second, creativity is often conceived as an intra-individual cognitive process, whereas innovation is understood as an inter-individual social process (Anderson & King, 1993; Axtell et al., 2000; Carrero, Peiro, & Salanova, 2000; Rank et al., 2004). Creativity could thus be first expressed at the individual level, almost without the manager having to interact with his/her environment. On the contrary, innovation requires that the manager confront his/her creative ideas with his/her environment so that they can be implemented and their usefulness assessed (Howell, 2005; Puccio & Cabra, 2010). Thus, the organizational context may have more importance with regard to innovation than creativity. As a result, creativity and innovation seem to mobilize different and complementary predispositions, notably regarding interpersonal skills (Rank et al., 2004).

Finally, some state-of-the-art reviews suggest conceiving creativity and innovation as the two main steps of a global process where creativity is the preliminary stage of innovation (Amabile, 1988; Anderson, Potočnik, et al., 2014; Rosing, Frese, & Bausch, 2011; Sarooghi, Libaers, & Burkemper, 2013). Thus, managerial creativity consists in the production of ideas or solutions, whereas managerial innovation can be seen as the successful implementation of these ideas or solutions within an organization (Amabile, 1988; Damanpour & Aravind, 2011). A manager wishing to propose a new practice to improve his/her way of working will therefore adopt a series of behaviors that have been studied and theorized as constituting the different stages of a creativity and innovation process.

The designation of this process and its specific steps do not yet show a consensus between researchers who studied distinctly creativity or innovation. In the next section, we will attempt to reach a clear conception of the process of creativity and innovation and the behaviors that compose it. For this thesis, we will retain that creativity is a necessary but not sufficient step for innovation (Amabile, 1988; Mumford & Gustafson, 1988). Thus, creativity is the process in which a manager engages to produce ideas or solutions that are new to him/her and that are intended to improve the way he/she performs an activity. Once this idea or solution is produced, the manager must then continue the process so that the idea or the solution could result in a practice, procedure or method that will be implemented and

recognized as a “marked departure from traditional management principles, processes, and practices” (Hamel, 2006, p. 75). Only then it will be considered as a managerial innovation.

Following the definition of managerial creativity that we proposed, managerial innovation could be understood as **the actions in which a manager engages to implement ideas or solutions that are original within his/her environment and that must be acknowledged as a notable improvement in managerial activities.**

Finally, we should highlight the comment raised by Amabile and Pratt (2016) that creativity and innovation taking place in organizations must aim to develop “a socially positive system of values, morals or ethics” (p.157). Indeed, leaders who would intent to improve employees’ performance by creating practices that would deteriorate employees’ well-being could not be seen as an innovative in the sense that it is not a morally good intention (see also Cropley, 2010).

## Notes on creative leadership

The relationship between creativity and leadership has been examined under the concept of *Creative leadership*. However, the term *creative leadership* encompasses different conceptions that do not strictly correspond to the scope of the present research. From a literature review, Mainemelis, Kark, and Epitropaki (2015) distinguished three manifestations of creative leadership: a *facilitating* manifestation, in which managers foster employees’ creativity; a *directing* manifestation, in which managers exert creativity; and an *integrating* manifestation, in which managers synthesize his/her and others’ creative work. In fact, scholars who studied creative leadership sometimes focused on only one or two of these three manifestations. For example, Basadur (2004) defined creative leadership as “leading people through a common process or method of finding and defining problems, solving them, and implementing new solutions” (p.111). Such a definition invokes only the *facilitating* manifestation. From a different perspective, referring only to the *directing* manifestation, Harris (2009) stated that creative leadership “is fundamentally and genuinely concerned with generating new organizational possibilities through challenging rather than reproducing the status quo” (p.11). Consequently, the term creative leadership can be used to either refer to leading creativity or leading creatively. This possible amalgam is not surprising because leaders’ support of employees’ creativity and innovative work behaviors almost necessarily imply to exert creativity (e.g., Mumford, Connelly, & Gaddis, 2003; Mumford, Scott, Gaddis,

& Strange, 2002; Mumford & Licuanan, 2004), and to be perceived as an *Innovative role-modelling* (de Jong & Den Hartog, 2007). Additionally, Puccio, Murdock and Mance (2007) addressed creative leadership as directed toward the only objective of driving organizational change. In their perspective also, creative leadership encompassed that leaders had to “live and practice principles of creative thinking” (*ibid.*, p.XVI).

Following the approach proposed by Mainemelis et al. (2015), the present research focuses on the *directing* manifestation of creative leadership that considers managers’ expression of their own creativity. However, contrary to Basadur (2004) or Puccio et al. (2007), we postulate that a manager can exert creativity to pursue different objectives than only to favor their collaborators’ creativity or to drive organizational changes.

## Creativity, innovation and change

The boundary between creativity, innovation and change is tenuous and can be easily confounded in practice. How can we discriminate with certainty managerial practices that are the result of creativity or simply a change from the current practices? From our definition of managerial creativity, any new practice that a manager exerts can be perceived as a result of his/her creative expression. However, managers can implement new practice as a result of a process that does not necessarily imply creativity. In order to support our assertion, we can take the example of a manager who started to ask his/her team to stand up during their weekly meetings. From the point of view of an external observer, we cannot determine if their practice results from a creative process. The manager could have made this decision for several reasons: because his/her superior asked, because it became a norm in the organization, because he/she heard a friend saying that it was better for employees’ backs or because he/she applied an evidenced-based approach (Pfeffer & Sutton, 2009) that implied consulting research about management practices and finding evidence that 20 minutes meetings were more efficient if people were standing-up (example cited in Pfeffer & Sutton, 2009). Without knowing the cause or the problem-solving process, we can only state with certainty that the manager introduced a change in his/her managerial practices. We could also evaluate the extent to which the practice in itself is creative - in a sense of new and adapted, but we cannot ensure that it results from a creative process. As outlined by Puccio, Murdock, and Mance, the main difference lays in managers’ *intent for deliberate creativity* (2007, p.21). In this sense, new practices that leaders suggest and implement would be considered as an expression of



creativity only if leaders had the deliberate intentions to be creative. Consequently, despite the notable limitations of self-report procedure in terms of common method variance (e.g., Donaldson & Grant-Vallone, 2002; Podsakoff & Organ, 1986; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Spector, 1994), this methodology enables managerial creativity to be studied in terms of managers' perception that they deliberately adopted behaviors composing the creative and innovative process.

A second concern is the relation between organizational change and leaders' creative skills. As stated previously, Puccio, Murdock and Mance (2007) conceived creative leadership as a means for suggesting and leading the implementation of organizational changes. They consider that changes suggested by creative leaders are "situations in which an explicit attempt is being made to bring an idea into being that has some degree of novelty" (2007, p.5). Thus, they do not conceive every organizational change as the result of creative leadership. Regarding the phase of change implementation, research on organizational change has demonstrated the critical effect of leaders' practices on employees' reactions to change (e.g., Cunningham et al., 2002; Eby, Adams, Russell, & Gaby, 2000; Oreg, Vakola, & Armenakis, 2011; Rafferty, Jimmieson, & Armenakis, 2013; Wanberg & Banas, 2000). Among managerial characteristics that lead to employees' positive reactions toward change one finds the managers' capacity to adapt their own practices in order to facilitate the change implementation, and their capacity to promote and convince others about the interest of the change (Dawson & Andriopoulos, 2014; Isaksen, Dorval, & Treffinger, 2010). Consequently, organizational change constitutes a circumstance that can – and most of the time should - trigger managerial creativity. Study 5 investigates specifically individual and organizational differences that influence leaders' reactions toward the implementation of an organizational change.

In summary, and according to Damanpour and Aravind (2012), change is a broader category that includes innovations, which in turn include creativity. Thus, every creative expression implies a change when it is implemented whereas every change does not imply creativity. However, changes in organizations have the potential to activate managers' creativity, notably as a means for facilitating its implementation.

# Chapter 2: Theoretical framework

The lack of synergy concerning research focusing on either creativity or innovation has been previously highlighted (e.g., Anderson, Potočnik, et al., 2014; Ford, 1996). However, studies that are included in the present thesis attempt to respond to calls from both perspectives to understand better the mechanisms of managerial creativity and innovation (e.g., Anderson, Potočnik, et al., 2014; Ramos et al., 2016), and rely on theories and experimental findings of either creativity or innovation.

## An individual approach

The broadest framework to which this research contributes is that of managerial innovation. Based on a literature review, Birkinshaw, Hamel, & Mol (2008) distinguished four perspectives that have driven research on the topic. (1) An *institutional perspective* that focuses on socioeconomic conditions and institutions that trigger and disseminate managerial innovations within organizations. (2) A *fashion perspective* that examines how aspects related to the needs and resources of new managerial ideas can affect their spread. (3) A *cultural perspective* that questions how cultural conditions within an organization shape and are shaped by managerial innovations. And (4) a *rational perspective* that focuses on the role of the manager in the invention and the implementation of new managerial practices that can later be recognized as innovations.

The studies that are presented in this research follow the *rational perspective* which is based on the principle that managerial innovations are initiated by individuals who want to improve the way the company works. At the same time, we wish to respond to Kunz and Linder 's (2013) call to address the lack of consideration of the individual and his/her predispositions, which are an essential condition for the emergence of managerial innovations. Moreover, it is in this perspective that the link between managerial creativity and innovation is the more prominent. Relying on a rational perspective does not exclude to investigate the effects of organizational characteristics on managers' creativity and innovation but we are mostly interested in managers' perceptions of their environment, and how such perception influence

their predispositions and actions, rather than focusing on objective aspects of the organization.

## **Stimulants of managerial creativity:**

### **The motivation phase**

A large part of the studies conducted in the present research have been inspired by one specific concept highlighted by Birkinshaw, Hamel, & Mol (2008). While studying the management innovation process, the authors highlighted a necessary and preliminary phase that they labeled *Motivation*. This phase “refers to the preconditions and facilitating factors that lead individuals in a company to be motivated to experiment with a new management innovation” (*ibid.*, p.833). Facilitating factors of organizational creativity have been subject to theories that will be presented in the following section. Preconditions refer to the circumstances where managers consider that existing management practices do not fulfill their needs. According to the authors, such preconditions can relate to a problem or an opportunity of enhancement to which managers will attempt to respond creatively. According to these authors, managers’ engagement in creative actions necessarily departs from the identification of a reason to exert creativity and from the presence of facilitating factors. In the present thesis, we will investigate several potential facilitating factors but also several reasons or circumstances that may lead managers to engage in creativity. Previous scholars contributed to understand better the nature of such circumstances and the decision-making process leading to creative or innovative responses. These works will be presented shortly afterwards.

### **Facilitating factors: A multivariate approach**

Since the 1970s, a multivariate approach of creativity seeks to identify exhaustively the factors influencing creativity and to develop integrative models. The multivariate approach focused first on the variety of cognitive attributes and personality characteristics that played a role in individuals’ creativity potential (Barron & Harrington, 1981; Cattell, 1971; McCrae, 1987). Later, the multivariate approach was applied to creativity as a performance or behaviors, and identified that environmental attributes played a critical role on the different steps of the creativity process (Amabile, 1988; Lubart & Guignard, 2004; Mumford &

Gustafson, 1988; Sternberg & Lubart, 1993). Some theories highlighted that different variables could interact in different way to facilitate creativity (e.g., Amabile, 1988; Ford, 1996; Hennessey & Amabile, 1988; Lubart & Sternberg, 1995; Woodman & Schoenfeldt, 1989). Two theories will be presented because they focused on organizational creativity and have constituted the framework of several experimental studies in the literature.

First, the componential model of creativity and innovation (Amabile, 1983, 1988, 1997; Amabile & Pratt, 2016) exposed the interdependence between individual creativity and organizational innovation. Indeed, organizations need to employ individuals that have the ability to produce new ideas if they want to be able to propose innovations. At the same time, individuals with a creative potential will not express creativity as part of their professional activity if the organization does not support, or at least allow them to do so. Regarding individual creativity, three components of the person are critical in the componential model (Amabile, 1983, 1988, 1997; Amabile & Pratt, 2016): *expertise or factual knowledge about the domain*, *creative-thinking skills*, and *motivation to innovate*. Expertise refers to knowledge and skills necessary to perform in a specific domain. Managers need to know the activities for which they are responsible, the problems that have been or could be encountered, the solutions that have been tried before, that have failed and succeeded if they want to implement truly new and adapted ideas. Therefore, expertise or knowledge constitutes the foundation for managers' creativity. Creative-thinking skills refer to individuals' tendency and capacity to explore new paths, to search for new solutions instead of performing routine behaviors without questioning it. Managers can have extraordinary expertise and knowledge in the management field; but they will not express new ideas if they do not have the required creative skills. Intrinsic task motivation refers to the extent to which individuals are motivated, enthusiastic to perform a specific task or activity. Without it, probabilities that individuals will make the effort of looking for creative solutions instead of routine ones decrease critically.

Moreover, several components of the environment influence individual creativity, such as organizational practices, strategies, values of leadership that are communicated and perceived, but also the behaviors and attitudes in leaders' close environment. For example, if executives do not support managerial creativity, it is less likely that creative practices will become the norm in management and that managers, even with a high creative potential, will suggest creative ideas in relation to their practices (e.g., Hirst et al., 2011; Hirst, Van Knippenberg, & Zhou, 2009; Scott & Bruce, 1994).

Additionally, individual creativity is stated to be influenced and influence organizational innovation. Regarding organizational innovation, the three necessary components are: *motivation to innovate* (e.g., leaders and members of the organization's openness, risk-taking and strategy to identify and develop new ideas), *resources in the task domain* (e.g., financial, material, time, human skills) and *skills in innovation management* (e.g., clear goal settings, giving individuals' autonomy, freedom, supportive feedback). The present research relies on Amabile's componential theory (1983, 1988, 1997; Amabile & Pratt, 2016) and the subsequent empirical studies to identify the characteristics of the managers and their environment that may influence their engagement in creativity.

The second theory is the interactionist model developed by Woodman and Schoenfeldt (1989, 1990) and Woodman, Sawyer, and Griffin (1993) enriches the componential model of creativity and innovation. It postulates that creative behaviors result from a complex interaction between the individual and the situation. To identify better which components of the individual and the situation are salient regarding creativity, the authors suggest to rely on three perspectives: the social psychology of creativity (stressed notably by the componential model, Amabile, 1983, 1988, 1997), the perspective of personality and the perspective of cognitive style. According to Woodman et al. (1993), individuals who are influenced by antecedent situations and who developed certain predispositions toward creativity have greater chances to act creatively if they are positively influenced by the group and the organization's characteristics. Thus, based on Woodman et al. (1993), we postulate that individual and organizational characteristics can influence managers' creativity through their interactions.

These two models received extensive support in the literature on organizational creativity and innovative work behaviors. They emphasize the need to consider several variables that, in interaction, influence individuals' creativity. Relying on these theories, we attempted to demonstrate the effects of several individual or organizational characteristics, and their interactions (operationalized through mediations, moderations or fit), on managers' engagement in creativity.

In the next chapter, we wish to present an overview of the main findings regarding individual (personality, cognitive, conative, attitudinal and motivational) and organizational characteristics that have been found to influence creativity and innovation in organizations. However, as postulated by Birkinshaw et al. (2008), facilitating factors are essential features

but should come along with managers' identification of the preconditions that activate their willingness to act creatively.

## Preconditions of managerial creativity

Preconditions refer to the circumstances where managers question the existing management practices. It involves leaders' identification of specific problems or opportunities that cannot be solved by applying routine practices and that require creativity. By problem, we mean the existence of a discrepancy between the current state and a desired state (Robertson, 2001). For example, several scholars highlighted that individuals in organizations had the possibility to adopt innovative behaviors in order to cope with occupational stress (e.g., Bunce & West, 1994; Martin, Salanova, & Peiró, 2007).

Most often, researchers on creativity consider that a problem leads to creative expression if it is new, complex, ill defined or poorly structured (e.g., Mumford, Baughman, Threlfall, Supinski, & Costanza, 1996; Mumford & Gustafson, 1988). Simon (1973) described the distinction between *well-structured* problems and *poorly structured* problems. All problems are considered to be poorly structured, with the exception of one where "capabilities [are] defined in advance, and that we do not allow the problem solver to introduce new resources that "occur" to him in the course of his solution efforts" (Simon, 1973, p.185). Thus, if managers are allowed to use new resources to produce a solution, the problem they try to solve can be considered as a problem that can be solved creatively. In the field of creativity, a poorly structured problem is characterized by a multitude of objectives, possible methods of resolution, and possible or acceptable solutions (Mumford, Mobley, Reiter-Palmon, Uhlman, & Doares, 1991). In the present research, we consider as a problem any situation in which the manager has the possibility to respond by suggesting new practices. If managers may frequently encounter such situation in their daily activities, they do not necessarily respond to them by engaging in creativity.

In fact, creative actions are very less likely to occur if managers do not perceive that the adoption of such actions makes sense considering the situation (Drazin, Glynn, & Kazanjian, 1999). Thus, creative actions result from a process through which managers assess the relevance of acting creatively to respond to a specific situation. In this process characteristics of the individual and its environment are scanned to determine the potential consequences of a creative response.

The first point of this *sensemaking perspective* is that individuals' actions are determined by the collective or individual interpretations of the meaning or scope of being creative (*ibid.*). Individual interpretation of creativity in management is closely related to their implicit theories of creativity that we wish to investigate in Chapter 4. Second, when optimal conditions can be reunited – the presence of an ill-defined problem and of facilitating factors (e.g., an organization that supports and provides resources for creativity, a manager who has the ability to generate new and adapted solutions), it is more likely that it results in creative actions if the manager integrates these components before making the decision to solve the problem in a certain manner (*ibid.*). Consequently, attributes of situations leading to managerial creativity are worth studying but leaders' inclusion of such attributes in their decision making process appears as a mediator (Drazin et al., 1999; Ford, 1996). The present research seeks to understand how individual, organizational and situational characteristics influence managers' innovative behaviors through their assessment of the relevance of creative actions in specific situations. In Chapter 4, we will investigate implicit theories that reflect how managers interpret the meaning of being creative in their work and that are postulated to compose the sensemaking process (Drazin et al., 1999). Chapter 5 examines how facilitating factors influences several components of the sensemaking process that results in managers' engagement in specific creative actions. Finally, studies in Chapter 6 investigate variables that have the potential to explain the effects of organizational and individual fit on managers' creative actions.

## **Creativity versus routine**

Ford (1996) proposed the theory of *Creative Actions* that he later applied to managerial decision-making (Ford & Gioia, 2000). Ford (1996), as Drazin et al. (1999) contributed to highlight that creative actions resulted from a sensemaking process integrating the attributes of the situation and the benefit to respond to it by creative actions. Ford (1996) described how the interactions between an actor, a situation, and an environment could constitute the circumstances for individual creative actions. In this sense, Ford (1996) adopted the same perception as previously cited authors that creativity occurs as a result of the adjunction of specific conditions that spawn a decisive trigger (Amabile, 1988, 1997; Amabile & Pratt, 2016; Birkinshaw et al., 2008; Drazin et al., 1999). However, Ford (1996) made a significant contribution by specifying that creativity referred to the expression of important and infrequent episodes of behaviors that are subjectively conceived as leading to new and

valuable outcomes in a specific domain. Indeed, Amabile and Pratt conceived creativity as “the production of novel and useful ideas by an individual or small group of individuals working together” (2016, p.2) and Woodman, Sawyer and Griffin defined organizational creativity as “the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social system” (1993, p.293). Thus, these two last authors did not emphasize that actions can be regarded as creative if the individual conceive it this way and that the adoption of such actions remains infrequent. The creativity-related behaviors have been examined and reviewed in several studies that will be presented in the next section.

Moreover, Ford (1996) highlighted that these creative actions are competing with individuals’ routines and habits and that organizations do not desire nor require extensive creativity. Following this statement, Pech (2001) demonstrated that organizational members had an inherent tendency to conform to the organizational norms and that organizations tend to select individuals who conform and to reward behaviors that do not disturb the status quo. Indeed, when creativity occurs in organizational contexts, it might entail undesirable effects such as questioning the status quo, disturbing consensual practices and provoking uncertainty (Mumford, Whetzel, & Reiter-Palmon, 1997; Sternberg & Lubart, 1995). Thus, even though executives claim the importance of creativity for leaders (IBM Institute for Business Value, 2010), we cannot ensure that this discourse reflects their readiness to undertake the difficulties and potential negative aspects of managerial creativity. This potential issue will be explored and discussed in Chapter 4.

Consequently, we assume that managers’ engagement in creative process is scarce and is not likely to happen unless managers discern that: a) acting creatively is a potential response to a situation (Ford, 1996), and b) that acting creatively can lead them to a desired state (Robertson, 2001). Based on these two necessary aspects, we postulate that factors such as leaders’ conceptions of managerial creativity, the nature of the situation, the individual abilities and traits, the organizational environment, and the process leading managers to dismiss routine behaviors are, *inter alia*, ingredients that will influence leaders’ discernment.

Moreover, as highlighted by Basadur (2004; Basadur & Basadur, 2011), the primary obstacle of managerial creativity and innovation does not stand on the quality of their creative performance but concerns the lack of engagement in creative actions such as identifying a problem to solve creatively or generating new solutions. Thus, following Drazin et al. (1999), the present research focuses on understanding “the process of engagement in creative acts,



regardless of whether the resultant outcomes are novel, useful, or creative” (p.287). Managers’ engagement in creativity is necessarily an antecedent of their creative performance. However, engaging in creativity does not automatically lead to perform well. And if individuals’ creative potential predicts creative performance, we cannot ensure that creative potential is the best predictor of managers’ engagement in creativity. If it were the case, managers’ engagement in creative actions could be seen as a mediator of the effect on creative potential on creative performance. One of the main contributions of the present research is to focus on managers’ decisions to engage in creative actions and to attempt to identify their specific antecedents. We did not consider the following effects of managers’ engagement in creative actions on managers’ creative performance because testing the effect of engagement on performance would be trivial without including it in a broader model and because previous research focused mostly on identifying the antecedents of managers’ creative performance (e.g., Myzskowski et al., 2015; Scratchley & Hakstian, 2001). The next section will attempt to present the kind of creative actions in which managers may engage.

## **A behavioral perspective**

### **Innovative work behaviors**

#### **The creativity and innovation process**

To identify and understand the nature of creative acts and the related needed skills, we need to grasp the process by which a manager can express his/her creativity to propose innovations. Theories about creativity and the innovation process aim to understand the nature of the behaviors and mental mechanisms involved when the individual engages in a creative activity. These theories and the behaviors they highlight concern creativity in organization and are not focusing on managers specifically. A following section will discuss how these behaviors can apply to managerial creativity. These behaviors are studied often as belonging to the invention stage (during which ideas are generated) or to the exploitation stage (which refers more to implementation and innovation) (e.g., Bledow, Frese, Anderson, Erez, & Farr, 2009; Duncan, 1976; March, 1991; Mom, Van Den Bosch, & Volberda, 2007; Roberts, 1988; Staw, 1990). These two main phases have been studied distinctly and have been subdivided into precise actions. Appendix 1.1 presents a summary of several approaches to the creative

and/or innovation process. However, the different actions required in order to complete the two stages of invention and exploitation can be encompassed under a unique term: innovative work behaviors (Dorenbosch, Engen, & Verhagen, 2005; Janssen, 2000; Scott & Bruce, 1994).

Dorenbosch et al. (2005) built on previous research on innovative work behaviors to propose a conception of behavioral activities grouped into four phases: *problem recognition*, *idea generation*, *idea promotion* and *idea realization*. The first phase goes under different names such as *problem recognition* (Dorenbosch et al., 2005), *problem construction* (e.g., Reiter-Palmon & Illies, 2004), *exploration* (de Jong & den Hartog, 2010) or *problem identification* (e.g., Reiter-Palmon & Robinson, 2009). Even though these constructs entail slight differences, they involve a certain number of steps that consist in making sense of an ill-defined problem. This entails first to anticipate or identify the existence of a problem or an opportunity to improve current practices (de Jong & den Hartog, 2010; Reiter-Palmon & Robinson, 2009). Following this, the nature of the problem must be defined (Mumford, Reiter-Palmon, & Redmond, 1994; Reiter-Palmon & Robinson, 2009). To do so, individuals can rely on several sources such as: past experiences (e.g., goals and results associated with previous problem-solving efforts); the nature of the problem (e.g., objectives and procedures or key knowledge to define and solve it), or the present levers and constraints for its resolution (e.g., organizational factors, Mumford et al., 1996; Mumford et al., 1994; Runco, 1994). With all this information taken into account, individuals form different representations of the problem. Representations will then be evaluated so that the individual has the ability to select and express one definite problem to solve (Mumford et al., 1994). Individuals' abilities to recognize a problem have been found to predict their ability to solve it creatively (e.g., Arreola & Reiter-Palmon, 2016). In two studies presented in this research, we did not encompass problem recognition as part of managers' creative actions. Instead, we identified potential problems (change implementation in Study 5, and incongruence between individual and organizational values guiding managerial practices in Study 7) and we examined how facilitating factors could influence, through a sensemaking process, managers' creative responses to these problems. In contrast, in Study 6 problem recognition was conceived as creative actions in which managers can engage.

The second phase, *idea generation*, consists of generating numerous alternative solutions to an identified problem (Dorenbosch et al., 2005). Kleysen and Street (2001) divided this phase into two: *generativity*, which consists of generating ideas, solutions, categories of

opportunities and combinations of information, and *formative investigation*, which consists of formulating, experimenting and evaluating these ideas. These two steps echo the work of Basadur (Basadur, 1994; Basadur, Graen, & Green, 1982) on creative problem solving. In his conception, Basadur suggested that creative problem solving comprises distinct stages: *problem finding*, *problem solving* and *solution implementation*, and that these stages are themselves composed of a two-step miniprocess of *ideation* and *evaluation* (Mumford, Zaccaro, Harding, Jacobs, & Fleishman, 2000; Puccio, Murdock, & Mance, 2005). Ideation is defined as “idea generation without evaluation (putting aside the judgment capability)” (Basadur, 1994, p.237) and evaluation is “the application of judgment to the generated ideas to select the best one(s)” (Basadur, 1994, p.237-238). If both aspects are essential to creativity and innovation, it has been highlighted that it involves different abilities and that it is essential that evaluation does not intervene during the ideation step in order for creative ideas to be freely expressed (Basadur & Finkneiner, 1985). The ideation step is seen to imply mostly divergent thinking abilities and the evaluation step, convergent thinking abilities (e.g., Cropley, 2006; Lubart, 2017; Mumford et al., 1991; Reiter-Palmon & Illies, 2004). Also, the ability to separate divergent from convergent thinking refers to the deferral of judgment skill (Basadur & Robinson, 1993). Basadur (2004) highlighted that leaders may lack familiarity with this two-step miniprocess, mostly with the step of ideation where new ideas are generated, which consequently hinders their ability to suggest creative solutions (see also Reiter-Palmon & Illies, 2004 for a review aimed at improving leaders’ understanding of the creative problem solving process). Consequently, we posit for the present research that innovative work behaviors should reflect five activities: problem recognition, idea generation, idea evaluation, idea promotion and idea realization.

The next phase, *idea promotion* encompasses the concept of *championing* (Howell & Higgins, 1990; Kleysen & Street, 2001). Idea promotion consists of expressing confidence in the interest of the idea, convincing others and finding support (e.g., psychological support and resources) for further implementation of the idea (Howell & Sheab, 2001; Janssen, 2000). According to Kleysen and Street (2001), it encompasses behaviors such as *mobilizing resources*, *persuading and influencing*, *pushing and negotiating*, and *challenging and risk-taking*. The characteristics of champions, individuals who are able to support and promote creative ideas, have been mostly studied on individuals who did not complete the three first phases of the process but who promoted ideas generated by others (e.g., Howell, Shea, & Higgins, 2005; Howell & Sheab, 2001).

Finally, the implementation phase, that is also referred to as *Application* (de Jong & den Hartog, 2010; Kleysen & Street, 2001) consists of the realization of the idea as a practice, product, procedure or method in the organizational setting. It encompasses behaviors of implementing, modifying and routinizing the practice as a regular work process (de Jong & den Hartog, 2010; Kleysen & Street, 2001).

## Empirical findings on the creativity and innovation process

One way to understand better the boundaries between these phases in an empirical way is to rely on research that developed innovative work behavior scales<sup>1</sup>. From the scientific literature, we identified 17 scales that are referenced in Appendix 1.2. Even though they have mainly been called *Innovative work behaviors* scales, they comprised stages of creativity and innovation. The construction of these scales was systematically based on scientific conceptions approaching the process as composed of several stages. Indeed, even the shortest scales combine items that refer to the different phases, such as Scott and Bruce's (1994) 6-item scale which assesses behaviors related to idea generation, promotion and implementation. Thus, innovative behavior scales are theoretically the reflection of this process and are consequently supposed to be multidimensional - in the sense that items composing these scales refer to behaviors involved in several different stages of the creative/innovative process and should assess more than one general construct. However, when the authors attempted to validate the dimensionality of their scales, psychometric analyses did not support a multidimensional structure most of the time (e.g., de Jong & den Hartog, 2010; Kleysen & Street, 2001). Only the scales of Krause (2004) and Dorenbosch, Engen, and Verhagen (2005) propose a two-dimensional structure. Krause (2004) identified that the behaviors pertaining to the creativity and innovation process can be grouped under two dimensions: *generation and testing of ideas*, that mostly encompass creativity-related behaviors, and *implementation*, that can be seen as the innovation part of the process. Similarly, Dorenbosch, Engen, and Verhagen (2005) identified the dimensions *creativity-oriented behaviors* and *innovation-oriented behaviors*. Results from these two studies suggest that two main phases of the process can be distinguished, referring respectively to creativity

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<sup>1</sup> Other means can be taken to apprehend the boundaries between the steps of the creativity and innovation process. For example, Mumford and colleagues developed a serie of studies that investigate the specific facilitating factors of the differents steps (Mumford, Baughman, et al., 1997; Mumford, Baughman, Supinski, & Maher, 1996; Mumford, Baughman, Threlfall, et al., 1996; Mumford, Supinski, Baughman, Costanza, & Threlfall, 1997; Mumford, Supinski, Threlfall, & Baughman, 1996). However, we relied on psychometric analyses of innovative work behaviors scale because we will rely on some of them in order to assess managers' engagement in innovative behaviors.

and innovation-related behaviors. Nonetheless, these two-dimensional structures have been supported by factor analyses but further confirmatory analyses and replication are needed to verify the structures. In the present research, different innovative work behaviors scales will be used to assess dependent variables. Corresponding psychometric analyses will be conducted and discussed in term of the dimensionality of innovative behaviors.

These empirical studies highlight the difficulty to identify, through a psychometric approach, and assess the different steps of the creative and innovative process. This could lead to the conception that the creativity and innovation process is not characterized by a series of distinct and sequential behaviors. In this sense, several authors advised to study this process as a reiterative one, in which generated ideas are never frozen but are constantly evaluated, reworked and replaced by new ones (Anderson et al., 2004; Sarooghi et al., 2013; Ven, Angle, & Poole, 1989). Creativity, then, is not the preliminary step to innovation, but one of the stages by which the process begins and to which the individual returns as often as possible to optimize the practice to be implemented (Gardner, 1993; Gruber & Davis, 1988; Mainemelis, 2010).

Moreover, for Paulus (2002), creativity does not only intervene when a new practice is generated but is also expressed at each stage of the process. For example, when the individual has to find the best way to promote or implement his/her idea. The innovation process can then be perceived as a recursive loop in which creativity is expressed at all stages. Finally, in the line of Scott and Bruce (1994), we could conceive the creativity and innovation process as discontinuous, in which individuals combine several behaviors without being able to really distinguish them. In the present research, the term creative actions will be used to encompass the various behaviors that are highlighted in the different creativity and innovation processes.

## **Application of innovative work behaviors to a managerial setting**

Innovative work behaviors can thus be expressed as long as an individual evolves in an environment where problem or opportunities can arise. In a management position, much of the tasks and activities can be regarded as a problem to solve (Mumford & Connelly, 1991).

To our knowledge, only one scale has been developed to assess managers' innovative work behaviors. However, this scale, established by Kunz and Linder (2013) does not assess managers' adoption of innovative behaviors but has the particularity of focusing on leaders'

intentions to adopt innovative behaviors. The authors constructed their scale based on the previous work of Scott and Bruce (1994) and Kleysen and Street (2001). They adapted the scales so that items represent intentions to adopt respectively the different behaviors composing the creativity and innovation process, and are oriented toward managerial activities. Sample items are “I will experiment with and evaluate the utility of new alternatives of managing and organizing” and “I will champion and take the risk to support new ideas of managing” (Kunz & Linder, 2013). Thus, leaders’ innovative work behaviors can be conceptualized as a set of creativity and innovation behaviors that are oriented toward any managerial activities. They conducted a principal component analysis that resulted in a single factor solution, suggesting that managers form the intentions to engage in innovative behaviors without distinguishing specific ones. Thus, innovative behaviors scales seem to have a similar structure when applied to general or managerial creativity in organizations.

Caroff and Lubart (2012) examined the differences of creativity expressed in different managerial activities. The authors aimed to establish whether managerial creativity was a general or specific ability. From the taxonomy of managerial activities developed by Yukl and Van Fleet (1992), the authors created nine situations that managers could encounter in their daily-activities (e.g., setting goals and organizing work for the team; congratulate and reward the team, delegate your role). For each of the nine situations, managers were asked to give as many adaptive solutions as possible. Three scores were calculated from their responses: a score of fluency (number of solutions that are suggested and adapted to the encountered problem), a score of flexibility (number of categories on which the solutions can be grouped) and a score of originality (on three points assessing whether the idea was totally unique, mentioned by one other manager, or mentioned by more than one manager). These three scores are the typical scores to assess individuals’ divergent thinking abilities (Runco, 1999) which have been identified as one of the main predictor of creative performance (e.g., Mumford, Marks, Connelly, Zaccaro, & Johnson, 1998; Scratchley & Hakstian, 2001). Results show that fluency and flexibility could be considered as general abilities. Thus, managers’ performance on fluency and flexibility does not differ according to the activities with which the problems are related. In contrast, managers’ originality performance was not stable for every activity. In fact, managers showed more or less originality on specific activities that can be grouped into five dimensions labeled: *managing conflict and team building*; *organizing and planning*; *goal setting*; *delegating*; and *solving problems*. Consequently, we can expect that different management problems can more or less trigger leaders’ intention to respond creatively. These creative responses are conceived as the

engagement in one or more innovative behaviors that have been presented in this section. In Study 3, 5 and 6, we will rely on Innovative work behaviors scales to assess managers' engagement in creative actions. In Study 4, we will focus on actions related to the steps of idea generation and idea evaluation. Finally, in Study 5, we ask managers to report their intention to adopt innovative behaviors (without specifying which ones) in order to implement a specific change.

This chapter aimed to establish the framework of our research. In the present thesis, we adopt a *rationale perspective* that conceives managerial creativity as a primary source of management innovation (Birkinshaw et al., 2008). Managerial creativity is expressed by the adoption of behaviors that enable leaders to find and implement new practices in their work. We assume that managers' engagement in creative behaviors is infrequent and result from an analysis of their relevance in specific situations through a *sensemaking* process. Finally, we conceive that the *sensemaking* process is influenced by individual predispositions and organizational characteristics.

Within this framework, we wish to investigate three avenues of research that can explain the variance in managers' engagement in creative action. The first avenue focuses on managers' conception of creativity and innovation in their activities. The second investigates the antecedents of managers' decision to act creatively in specific situations. The third avenue examines how the adequacy between leaders and their organization influences their engagement in creative action. The next chapter will present theories and findings that justify these research issues and that allowed us to identify the relevant individual differences that had the potential to influence managers' engagement in creative actions.

# **Chapter 3: Antecedents of managerial creativity and innovation**

This chapter is organized in three sections: the first one presents current lay conceptions of the characteristics of an effective leader and acknowledge the necessity to examine leaders' conceptions of managerial creativity. The second section presents an overview of the individual and organizational antecedents of individual creativity. Finally, the third section introduces the concept of person-organization fit and advocates its relevance to apprehend how the conjunction between managers and their environment can trigger the adoption of innovative behaviors.

## **Understanding how leaders conceive managerial creativity**

### **A negative perception of creativity**

According to Drazin et al. (1999), individuals' engagement in creative behaviors depends partially on their interpretation of the meaning and scope of creativity in their activities. In other words, if managers perceive creativity as a desirable feature, that makes them effective leaders, or that has the potential to facilitate or increase their performance, it will be more likely that they engage in creative actions. Thus, a positive a priori perception of creativity applied to management could be considered as a first condition for creative actions to emerge. However, previous research on leadership and creativity, or on leaders' perception of what make them efficient does not lead to the conclusion that creativity is a desirable feature for management (e.g., Epitropaki & Martin, 2004; Mueller et al., 2011).

Mueller, Goncalo, and Kamdar (2011) noticed that creativity was often associated with traits, such as uncertainty, nonconformity and unconventionality, that opposed individuals' expectations regarding their leaders. Therefore, the authors investigated the link between



creative performance and perceptions of leadership potential. They conducted a first study on employees who were engaged in creative tasks in their organizations, and a second study on students that were asked to generate and present a creative or only a useful solution to a question. In both studies, results demonstrated that evaluators attributed less leadership potential to individuals who were perceived as more creative. A third study demonstrated that this effect is inversed when evaluators focused on the potential to become a charismatic leader. From their findings, the authors concluded that the implicit conceptions of leadership might be incompatible with the expression of creativity and that this bias could explain, to a certain extent, leaders' failure to conduct changes in organizations.

Individuals' behaviors are, *inter alia*, the result of their beliefs about their abilities, about the norms and about specific actions (Fishbein & Ajzen, 2011). If individuals in organizations perceive negatively creativity as a trait for leaders, it is likely that managers would form unfavorable normative and attitudinal beliefs toward creativity and consequently hinder their engagement in creative actions. These beliefs have been notably studied under the concept of implicit theories. Implicit theories refer to "the constellations of thoughts and ideas about a particular construct that are held and applied by individuals" (Runco & Johnson, 2002, p. 427). They are largely personal; they reflect the individuals' knowledge, and are expressed through opinions and expectations (Runco, 1999). Thus, they could be distinguished from explicit theories, that is to say scientific ones (Sternberg, 1985).

## **Implicit leadership theories**

Individuals in organizations hold beliefs on the characteristics that are desirable for a manager, that make him/her effective. These beliefs are investigated in research on implicit leadership theories (ILT). Reviewing previous research on ILT enable to detect the extent to which creativity is conceive as a positive characteristic for managers. Implicit leadership theories (ILT) have received considerable attention for many decades (e.g., Epitropaki & Martin, 2004; Offermann et al., 1994). They refer notably to the assumptions about traits and abilities of effective leaders (Epitropaki & Martin, 2004). As stated by Offermann, Kennedy, and Wirtz (1994), implicit leadership theories are the result of people's experiences with leaders, and because everyone has different experiences, everyone could hold different implicit theories about the prototypical characteristics of a leader. Also, individuals can more or less emphasize different features of leadership, which may result in a multifactorial structure of ILT. Moreover, implicit leadership theories are influenced by organizational

contexts. Indeed, leaders in similar contexts tend to hold similar implicit leadership theories (Junker & Van Dick, 2014; Lord, Brown, Harvey, & Hall, 2001). Consequently, managers are likely to hold different ILT that can more or less emphasize creativity-related aspects, depending on their knowledge, previous experiences and current organizations.

Among studies on implicit leadership theories, two deserve special attention because they investigated the content structure of those theories. First, Offerman, Kennedy, and Wirtz (1994) asked students to list 25 traits that characterized a leader or a supervisor. From their answers, authors developed and validated a list of 160 characteristics, and noticed that these characteristics are organized in eight dimensions. Six dimensions encompassed prototypical characteristics: Sensitivity, Dedication, Charisma, Attractiveness, Intelligence and Strength, and two dimensions described antagonistic characteristics: Tyranny and Masculinity. In another study, Epitropaki and Martin (2004) addressed the generalizability of these eight dimensions across different groups of British employees from various organizations. Their results favored a six-dimensions structure, consistent across groups, that encompasses the dimensions of Sensitivity, Dedication, Intelligence, Dynamism<sup>2</sup>, Tyranny, and Masculinity but did not confirm the generalizability of the dimensions Attractiveness and Strength. To our knowledge, among these six dimensions, none encompassed any item that specifically referred to creativity or innovation.

Second, as part of the GLOBE study, Den Hartog, House, Hanges, Ruiz-Quintanilla, Dorfman, and Globe-Associates (1999) investigated the universally endorsed characteristics of a leader. More than 15,000 managers in the world were asked to describe leaders' attributes and behaviors that they perceived to enhance or impede outstanding leadership. They concluded that the attributes of a leader that are universally shared evoke mainly integrity and a charismatic or transformational leadership style (e.g., trustworthy, charismatic, visionary, team-oriented). From these results, it is worth noting that transformational and charismatic leadership have been demonstrated to share a considerable amount of characteristics with creative leadership (Bass & Avolio, 1994; Bass, 1985; Bryman, 1992).

ILT have been explored across cultures (Den Hartog et al., 1999; House, Javidan, Hanges, & Dorfman, 2002) and different groups of employees (Epitropaki & Martin, 2004; Hogg et al., 2005; Lord & Brown, 2001). Results show that several attributes of ILT are similar across culture (e.g., *encouraging*, *communicative*), while others are more emphasized in some

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<sup>2</sup> The dimension Charisma established by Offerman, Kennedy, and Wirtz (1994) was renamed Dynamism by Epitropaki & Martin (2004).

cultures (e.g., *sincere, sensitive*). Among the attributes that differ across cultures, some could indirectly refer to dispositions toward creativity, such as risk-taking, unique, willful, independent, autonomous, provocateur (Den Hartog et al., 1999). Castel, Deneire, Kurc, Lacassagne and Leeds (2007) compared ILT in France and other countries. Based on data obtained in the GLOBE study (House, 2004), authors showed that participative leadership was the only leadership style that was more positively valued in France than elsewhere. They also investigated social representations (Moscovici, 2001) of an exceptional leader in France. Their results showed that thirteen attributes were prototypical of an exceptional leader in France: *informed, intelligent, anticipatory, motivational, team builder, win problem solver, trustworthy, positive, competitor, just, moral, dependable* and *encouraging*. After analyzing the structure of these representations, Castel et al. (2007) concluded that French managers primarily conceive an exceptional leader as a *people-oriented* person. From these results, we cannot conclude that French managers are more or less favorable to creativity-related traits than leaders from other countries. Nevertheless, we could presuppose that French managers might perceive creativity more favorably when it is aimed to improve their people-orientation.

Within research on ILT, none has, to our knowledge, captured any implicit conception referring to creativity itself. Epitropaki, Sy, Martin, Tram-Quon, and Topakas (2013), and later, Mainemelis, Kark and Epitropaki (2015) acknowledged also the “striking” absence of the creative trait in ILT. Even more surprisingly, Lord, Foti and De Vader's (1984) study of ILT included the trait “creative” but as a non-leader attribute. This result may not be representative of ILT among organizational members because participants were undergraduate students in psychology. Thus, we cannot state with certainty that the trait “creative” is negatively related to leadership in members of organizations’ ILT, even though such assumption would be coherent with Mueller, Goncalo, and Kamdar's (2011) results.

Consequently, the recent call from CEOs to consider creativity as the most important attribute for new leaders does not echo yet the implicit leadership theories where creativity is always absent or not considered as a prototypical trait of a leader (Lord et al., 1984). This absence can have for consequences to impede leaders’ adoption of innovation behaviors and the organizational recognition of creative leaders. In order to understand if this absence is synonymous with a negative perception of creativity in relation to management, or if it simply caused by the fact that creativity is not (yet?) a central feature for leadership and management, three studies presented in chapter 4 investigate specifically managers’ implicit theories of management creativity and innovation.

Moreover, the relation between implicit theories and sensemaking is tenuous. Managers' implicit theories of creativity could be studied as an antecedent of the sensemaking process. In this case, managers' favorable conceptions of creativity would be conceived as a facilitating factor that is supposed to be taken into account through the sensemaking process. On the other hand, most scholars in both fields of research of implicit theories (Epitropaki & Martin, 2004; Jenkins, 2014; Junker & Van Dick, 2014) and sensemaking in organizations (Drazin et al., 1999; Poole, Gioia, & Gray, 1989; Seligman, 2006; Weick, 1995) consider implicit theories as a component of the sensemaking process. Thus, managers' implicit theories of creativity function as a filter, through which the characteristics that facilitate creativity take a certain sense and lead consequently to more or less creative actions.

## Understanding the antecedents of managers' engagement in creative actions

Apart from leaders' negative conceptions of managerial creativity, two of the main obstacles of managerial creativity and innovation could be leaders' lack of familiarity with the application of creativity in management settings and their difficulties to identify and seize opportunities to act creatively (Basadur, 2004; Basadur & Basadur, 2011). As acknowledged previously, one common way for leaders to express their creativity at work is to adopt a creative problem solving approach (e.g., Mumford et al., 2000; Reiter-Palmon & Illies, 2004; Whetten & Cameron, 1991). Creative problem solving was defined as "seeking original ways to reach a goal when the means to do so are apparent" (Brophy, 1998, p. 199). Creative problem-solving is mostly seen as a three-stage process of problem-finding, problem-solving and solution implementation (Basadur, 1994; Basadur et al., 1982) and each of the three stages comprises a miniprocess composed of two steps (*ibid.*). The first step, called *idea producing* or *ideation*, is the generation of many ideas without any evaluation. This step is typically evaluated through divergent thinking tests in which participants are asked to find many original solutions regarding a specific problem (e.g., McCrae, 1987; Scratchley & Hakstian, 2001). The second step is called *idea evaluation* and is defined as the application of judgment to the ideas generated (Basadur & Finkneiner, 1985). Evaluation can be seen as related to convergent thinking when conceived as the "ability to integrate and combine

elements in order to elaborate the most creative idea possible for implementation” (Myszkowski et al., 2015, p. 675). The adoption of creative problem solving has been demonstrated to enhance leaders’ performance (Basadur & Robinson, 1993; Mumford, Zaccaro, Harding, Jacobs, & Fleishman, 2000) and to facilitate the diffusion of innovative behaviors in organizations (Scott & Bruce, 1994).

However, within the creative problem solving process, leaders show a strong preference for the step of idea evaluation and the phase of solution implementation (Basadur & Basadur, 2011; Basadur & Gelade, 2002). Basadur and Basadur (2011) also demonstrated that people oriented toward ideation are underrepresented in business organizations. They stated that organizations seeking to increase creativity and innovation should learn to recognize and support the few individuals with divergent thinking skills. Instead, organizations are mostly rewarding leaders for their capabilities to make the right decision or to select the best solution but rarely for their ability to suggest numerous and diverse solutions that will be evaluated afterwards (Basadur et al., 1982; Hughes, 2003). Consequently, leaders are more familiar with the evaluation step and less experienced with the divergent-thinking one. Yet, in order to find solutions that are adapted but also original, the ideation step, with a complete deferral of judgment is a necessary condition (Hughes, 2003). Thus, if organizations wish to further management creativity and innovation, they need to identify the barriers impeding leaders’ expression of their divergent thinking skills. Otherwise, when leaders are confronted with ill-defined problems or opportunities of enhancement, they might not intend to use creative problem solving but rather continue to select the most adapted existing solution (Basadur & Gelade, 2002; Basadur et al., 1982). The fourth study (in Chapter 5) composing the present research will investigate the antecedents and sensemaking process of managers’ intentions to solve problems in their daily activities by engaging in a mini-process of ideation evaluation. By doing so, we wish to contribute to understand better how leaders that are, to a lesser extent, familiar with ideation can form the decision to apply it when solving managerial problems.

Moreover, Basadur and Basadur (2011) highlighted that managers who had the ability to identify problems or opportunities that allow them to express creativity were underrepresented in organizations. Yet, there is little doubt about the presence in managerial activities of situations that would give them the opportunity to suggest new practices. Thus, we posit that the underlying reasons of such a lack of perceived problems or opportunities do not emerge from an absence of situations but results from individuals’ evaluation of the

relevance of creative actions to respond to these situations. To test this assumption, the fifth study (Chapter 5) confronts managers to a specific situation that has been recognized as necessitating managers to adapt their practices: the implementation of telework in their team. From there, we will assess managers' evaluation of the situation and investigate how individual and organizational factors influence managers' evaluation of innovative behaviors as a response to the situation.

For these two studies, presented in Chapter 5, we postulated that managers' decision to engage in the creativity process results from individual predispositions, as well as environmental factors that are more or less taken into account through a sensemaking process. In the next section, we will present findings of experimental studies of the individual and organizational factors facilitating organizational creativity and innovation.

## **Individual and organizational attributes**

Drawing from the componential theory of creativity (Amabile, 1988, 1997; Amabile & Pratt, 2016) and the interactionist theory (Woodman et al., 1993; Woodman & Schoenfeldt, 1990), experimental and fundamental research highlighted numerous personal and organizational characteristics that influence individual creativity (performance and/or behaviors). Main results will be presented in the next section and more findings are acknowledged in Appendix 2.1. However, force is to note that very little research focused on managers' characteristics or antecedents of managerial creativity and innovation. Moreover, several scholars highlighted that antecedents of creativity may differ according to the domain of application (e.g., Lubart & Guignard, 2004; Mumford & Gustafson, 1988). Consequently, managers' predispositions toward creativity may slightly differ from individuals' predispositions in general (e.g., Barron & Harrington, 1981; Lubart & Guignard, 2004; Plucker, 2011; Reiter-Palmon, Illies, Cross, Buboltz, & Nimps, 2009; Silvia, Kaufman, & Pretz, 2009).

Also, we seek to identify, in the present research, the antecedents of managers' engagement in creative actions rather than their potential or performance. Nevertheless, we posit that every variable that has been demonstrated as a predictor of creative performance has the potential to also predict managers' engagement in creative actions. In the different studies presented in this research, we examined the effects of individual and organizational antecedents that are

presented in the next sections and that showed previously a significant effect on organizational creative performance or adoption of innovation behaviors.

The next sections do not seek to be exhaustive but wish to present an overview of the main antecedents of organizational creativity and innovation (see also Appendix 2.1). More detailed reviews of individual and organizational determinants of management innovation have been proposed by Anderson, Potocnik, and Zhou (2014); Crossan and Apaydin (2010) and Damanpour and Aravind (2011).

## Individual predispositions

At the individual level, creativity can be understood as a potential to generate creative ideas that is more or less developed (DiLiello & Houghton, 2008; Sternberg & Lubart, 1999). But creativity can also be conceived as a performance (DiLiello & Houghton, 2008; Mumford et al., 2012). In this case, it is analogous to the adoption of creative behaviors or to the resulting productions. Individual characteristics that are related to potential, and that are capable of predicting creative performance, result from a combination of personality traits, cognitive, conative factors (e.g., Lubart, 1999) and attitudes (Basadur & Basadur, 2011; Ettlie & O'Keefe, 1982).

### Personality

The link between personality traits and creativity has been the subject of numerous studies. They have consistently identified a positive link between creativity and openness to experience (Da Costa, Páez, Sánchez, Garaigordobil, & Gondim, 2015; McCrae, 1987). In a more equivocal way, extraversion and neuroticism seem to have a positive relationship with creativity (McCrae, 1987), whereas this link is negative with agreeableness (King, Walker, & Broyles, 1996). In addition, studies of the relationship between consciousness and creative performance noticed effects of different kinds. Reiter-Palmon, Illies, and Kobe-Cross (2009) offer an explanation for these results: consciousness is composed of two aspects, one refers to *achievement*, accomplishment and other proactive characteristics that positively correlate with creativity; the second aspect refers to *dependability*, order and other inhibitory characteristics that negatively correlate with creativity. Research that focused on managerial creativity identified that *openness to experience* (Myszkowski et al., 1999; Scratchley & Hakstian, 2001) as a positive predictor, and *agreeableness* as a negative predictor of managers'

divergent-thinking performance but a positive predictor of their convergent-thinking performance.

Numerous studies examined the effect of personality on creativity by using the Adjective Check List (ACL, Gough & Heilbrun, 1965). The ACL is a list of 300 adjectives that is commonly used to evaluate the attributes of an individual. Among these 300 adjectives, several researchers identified the attributes that characterize a creative person. From their results, they created creative personality scales of which the validity has been attested for most (e.g., Domino, 1994; Gough, 1979). For example, Gough (1979) developed the Creative Personality Scale (CPS), which consists of 18 items characterizing a creative person (e.g., Intelligent, Confident, Egoist) and 12 items characterizing a non creative person (e.g., Conservative, Conventional, Honest).

To our knowledge, the validity of the CPS to measure the creative personality of managers and predict their performance has yet to be demonstrated. In the organizational context, Oldham and Cummings (1996) investigated the effect of employees' personality on their creative performance. The authors used the CPS to assess employees' creative personality. Moreover, employees' creative performance was assessed in three ways: by their managers, by the number of employees' patent applications, and through an evaluation of the number of creative suggestions for an internal change process that have been proposed by the employee and accepted by the committee. The results of this study showed that employees' creative personality, as assessed by the CPS, correlated positively and significantly with only the number of patents applications. This result could lead to the conclusion that CPS is not an adapted measure of creative personality as expected in organizations. Such a conclusion would support research that considers that personal characteristics of creative individuals differ according to the domain of endeavour (e.g., Baer, 2012, 2015; Baer & Kaufman, 2005). For example, creative managers or leaders tend to be emotionally stable, whereas artists do not present this characteristic (Batey & Furnham, 2006). Consequently, adjectives of the CPS that are related to emotional stability could predict positively leaders' creativity and negatively artists' creativity.

However, as the only measure of creative performance that correlates with the creative personality of employees is a more "objective" measure (number of patents applications), these results may also suggest that employees with a personality closer to that of a creative person are not recognized as such by their superiors or by organizational committees. Thus, it would not be the validity of the CPS in the organizational environment that should be



questioned but the equivalence between the characteristics of a creative person and the perceived characteristics of a person expressing his/her creativity in the organization. The CPS would then predict the creative performance and not the perception by others that the employee is creative. Consequently, further studies are still needed to better understand how personality traits are a) predictors of managerial creativity and b) related to the evaluations of the person as creative. Studies 1, 2 and 3 will be discussed in this perspective.

## Cognitive attributes

Abilities underlying creative performance have been studied for decades (Guilford, 1950; Torrance, 1966, 1974). Skills and abilities that facilitate the expression and the quality of creativity are numerous and sometimes specific to the phases of the creativity and innovation process (e.g., Mumford, Baughman, Maher, Costanza, & Supinski, 1997; Reiter-Palmon, Mumford, O'Connor Boes, & Runco, 1997; Vincent, Decker, & Mumford, 2002).

Analytic, associative and evaluative thinking are facets of intelligence that have been suggested as predictors of creative performance (e.g., Barron & Harrington, 1981; Puccio, Murdock, & Mance, 2005; Sternberg, 2007; Sternberg & Lubart, 1995). However, Scratchley and Hakstian (2001) showed that intelligence was marginally related to managers' creative performance. Besides, the two principal cognitive abilities of a creative person are divergent and convergent thinking. Divergent thinking refers to the ability to look for alternative paths when seeking problems, opportunities or solutions. Since the work of Guilford (1950), divergent thinking represents the essential feature of creative performance. Thus, most research that attempts to assess managerial creative performance involve divergent thinking tests (e.g., Caroff & Lubart, 2012; Myszkowski et al., 2015; Scratchley & Hakstian, 2001). Divergent-thinking tests should not be conceive as a measure of the overall creative performance but focus only on the assessment of divergent-thinking skills that are necessary to perform creatively (e.g., Runco & Acar, 2012; Lubart, Besançon, & Barbot, 2011). In such tests, managers are confronted with a problem (general or focused on managerial activities) and asked to give as much solutions as they can. Their performance is then assessed by fluency, the number of given ideas; flexibility, the number of ideas that correspond to different categories; or originality, the extent to which the given ideas are rare among the ideas given by all participants.

If divergent thinking abilities are necessary during each phase of the process in order to find original ideas or solutions, leaders also need to be able to evaluate their ideas and select the

most appropriate (Basadur, 1994; Basadur et al., 1982). Such ability can refer to convergent thinking (Mobley, Doares, & Mumford, 1992; Mumford et al., 1991; Reiter-Palmon & Illies, 2004). Lubart (2017) highlighted that the term *convergent thinking* entailed several conceptualizations and that they were not related to creativity to the same extent. Indeed, convergent thinking can be conceptualized as the ability to find the right answer (Guilford, 1956, 1967, 1968), to evaluate and select ideas (Isaksen & Treffinger, 1985; Treffinger, 1995), or to integrate and synthesize ideas (Spearman, 1931). According to Lubart (2017) the two last conceptualizations have more implications to creative thinking because creativity is rarely related to the existence of a unique solution.

Without convergent thinking abilities, leaders may not be able to synthesize their ideas, to apply correct criteria and to select the most promising one (Basadur, 1994; Basadur et al., 1982; Blair & Mumford, 2007; Dailey & Mumford, 2006; Myszkowski et al., 2015). Among the different criteria, leaders must be able to evaluate the potential of their ideas within their current environment (Mumford, Lonergan, & Scott, 2002). Convergent thinking abilities - in relation to creativity - can be assessed after the divergent thinking test by asking managers to select or elaborate the most creative solution to a given problem. These solutions will then be evaluated by experienced judges (e.g., Amabile, 1983). Also, scales such as the Creative Product Semantic Scale (Besemer & O'Quin, 1983; O'Quin & Besemer, 1989, 2006) can be applied to evaluate the solutions on several aspects (originality, resolution and elaboration). Moreover, Cropley, Kaufman, and Cropley (2011) developed a specific tool: the Creative Solution Diagnosis Scale that could be used to assess the product of managerial creativity on five criteria: *Relevance & Effectiveness, Problematization, Propulsion, Elegance* and *Genesis*. Additionally, Kirton (1976, 1977) studied the propensity of a manager to innovate on a continuum between adaptor and innovator styles. These cognitive styles refer to different manners of solving problems. Adaptors are managers who improve current practices while respecting the structure of the organization whereas innovators are looking to transcend and improve the system itself. Both styles are considered to exert creativity, but in different ways (Kirton, 1978). The main difference lies in the aim and the result of the creative performance. The work of Kirton (1976, 1977) could echo the work of Sternberg, Kaufman, and Pretz (2003) as they both seek to understand how leaders differ in the ways to express creativity. Indeed, Sternberg et al., (2004) proposed the *propulsion model* of creative leadership that postulates that leaders can express creativity through different approaches on current situations: by accepting it and attempting to convince others to accept it and to extend it; by

rejecting current situations and finding ways to modify it; or by integrating existing paradigms to create new practices from this synthesis. Consequently, leaders' apprehension of current situations and problems can differ and entail specific abilities that have the potential to trigger managers' creativity.

Finally, as acknowledged by Amabile (1988; Amabile & Pratt, 2016), individuals have greater chances to be creative if they have considerable knowledge in the domain of application. Indeed, knowledge allows leaders to avoid reinventing the wheel but also enhance their self-efficacy and their propensity to perceive broader perspectives on their practices (Amabile & Pratt, 2016; Hirst et al., 2009; Krause, 2004; Zhou & Shalley, 2008). Knowledge and domain relevant skills are necessary during the phase of idea evaluation to allow managers to select the relevant criteria and test each idea against them (Amabile, 1983, 1988).

## Conative attributes

Because suggesting and implementing creative practices entails more uncertainty and possibility of failures than applying existing practices, innovative behaviors are related to individuals' tolerance of ambiguity (Zenasni, Besancon, & Lubart, 2008). Tolerance of ambiguity refers to individuals' perception and acceptance of ill-defined situations (Furnham, 1994). A high tolerance to ambiguity is seen as helping individuals to bear with competing information and to persist when developing and implementing new ideas (Shalley, Zhou, & Oldham, 2004). In the same vein, traits such as perseverance (Feist, 1999), propensity to seek sensations (Joy, 2004), and need for accomplishment (Chusmir & Koberg, 1986) have been found to be positively related to creative performance. The notion of disposition or willingness to take risks has also been explored as an antecedent of creativity (Feist, 1999; Sternberg & Lubart, 1995; Tyagi, Hanoch, Hall, Runco, & Denham, 2017). Indeed, suggesting and implementing new practices implies that consequences of our actions are uncertain and can lead to failure and being held responsible for it (George, 2007). Consequently, the engagement in a creative process requires that individuals are willing to take risk, and to buy low in the hope of selling high (Sternberg & Lubart, 1995). However, little experimental research demonstrated the existence of a link between risk-taking (or willingness to take risks) and creativity. Madjar, Greenberg and Chen (2011) found that

willingness to take risks predicted radical creativity<sup>3</sup>, had a positive but non-significant effect on incremental creativity and a negative and non-significant effect on routine performance. Previously, Lubart and Sternberg (1995) concluded also that risk-taking was a domain-specific trait. From the work of Blais and Weber (2006) who highlighted that individuals were more or less willing to take risks in different domains, Tyagi et al. (2017) demonstrated that risk in the social domain only correlated with creative personality (assessed by the CPS, Gough, 1979), ideation and self-reported creative achievement. Concerning management and risk-taking, Cyert and March (1963) concluded that managers were mostly risk avoiders. March and Shapira (1987) demonstrated that managers and executives had implicit theories of risk that differed from explicit ones. For example, managers perceived that risk is only associated with negative outcomes (*ibid.*). Consequently, taking risk is more regarded by managers as an option that should be selected only when there is no other choice, rather than a potential option that is always available and that would permit to either loose or win more than if you had selected routine alternatives. Thus, disposition or willingness to take risks may constitute an antecedent that more specifically fits creativity in management, but such an effect has not been demonstrated. In the present research, we will attempt to fill this gap by demonstrating that managerial risk-taking predicts their adoption of innovative behaviors (Study 6). Moreover, March and Shapira (1987) noticed that managers' propensity to take risks was influenced by individual and organizational factors.

Another category of conative attributes focuses on individuals' perception of their own creative abilities. Self-efficacy (Bandura, 1977), creative self-efficacy (Choi, 2012; Choi, 2004; Tierney & Farmer, 2002, 2004, 2011), capability beliefs (Ford, 1996) or perceived control (Cloutier & Leroux, 1998; Goepel, Hölzle, & zu Knyphausen-Aufseß, 2012) have been investigated as essential direct antecedents of the intention or adoption of innovative behaviors. Thus, for Ford (1996), managers have greater chances to adopt routine behaviors if they do not perceive themselves as being capable of generating and implementing creative practices. Creative self-efficacy can be conceived as a proximal antecedent of managers' creative behaviors that results notably from past experiences (Ford, 1996), job self-efficacy, supervisor behavior and job complexity (Tierney & Farmer, 2002).

Moreover, as suggested by Amabile (1988; Amabile & Pratt, 2016), the fuel for creative action lies in individuals' motivation. Different types of motivation have been studied with

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<sup>3</sup> In the work of Madjar, Greenberg and Chen (2011), radical creativity refers to ideas that substantially modify existing practices whereas incremental creativity refers to ideas that imply minor changes in existing practices. The authors highlighted that both types of creativity are equally necessary and valuable.

regard to creativity. Most research referred to the first version of the componential model of creativity and focused on intrinsic motivation. Intrinsic motivation refers to the desire to act in a specific way for the sake of the action itself, because it relates to positive feelings of enjoyment, satisfaction, and pleasure. In contrast, researchers stated for a long time that extrinsic motivation, which focuses on external reward or punishment if the action is carried or not, was not related to creativity or even negatively related (Amabile, 1985, 1988, 1997; Amabile, Hil, Hennessey, & Tighe, 1995). Gilson and Madjar (2011) demonstrated that intrinsic motivation was a predictor of incremental creativity whereas extrinsic motivation predicted radical creativity. However, in the latest version of the componential model of creativity and innovation, Amabile and Pratt (2016) updated their view of the role of extrinsic motivation in creativity and stated that different mechanisms can lead to an additive effect between intrinsic and extrinsic motivations on creativity. From the work of Deci and Ryan (1985), Amabile and Pratt (2016) distinguished informational extrinsic motivation, which consists of being motivated by external sources' information and feedback on one's work, from controlling extrinsic motivation, consisting of acting because you are being told to and lacking self-determination. Consequently, extrinsic and intrinsic motivations are at the confluence between the individual, his/her perception of work and organizational demands, and injunctive norms regarding his/her behaviors. When informational and intrinsic motivations are present, they enhance individuals' adoption of innovative behaviors, whereas controlling motivation acts as a barrier for individuals' creativity.

From a more individual approach, motivation can be regarded as a regulatory focus (Baas, De Dreu, & Nijstad, 2008; Crowe & Higgins, 1997; Herman & Reiter-Palmon, 2011). Regulatory focus concerns the hedonic nature of an individual - what he/she is driven by. It is thus a more stable predisposition than extrinsic or intrinsic motivation. Regulatory focus can be of two specific types. When individuals' actions are driven by "attaining accomplishments or fulfilling hopes and accomplishments" (Higgins, 1997, p. 1282), they are promotion focused. Conversely, when individuals' actions are driven by "insuring safety, being responsible and meeting obligations" (Higgins, 1997, p.1282), they are prevention focused. A promotion focus is mostly conceived as leading to more creativity than prevention focus (Baas, De Dreu, & Nijstad, 2011). However, such effect seems to depend on moods that are activated (Baas et al., 2011), regulatory closure (Baas et al., 2008) or specific phases of the creativity and innovation process (Herman & Reiter-Palmon, 2011).

Additionally, some scholars started recently to investigate the role of identified motivation on creativity (Bammens, 2015; Kasof, Chen, Himself, & Greenberger, 2007). Identified motivation is a component of extrinsic motivation that refers to being motivated to enact in accordance with the values that are important to us (Deci & Ryan, 2000). Employees with a high level of identified motivation are more inclined to put efforts in order to act in adequacy with their values. To do so, they may engage in creative behaviors that will allow them to create and adopt practices that correspond to their values (Bammens, 2015; Kasof et al., 2007). Finally, Amabile (1983; 1988) postulated that motivation - with no specification regarding the type - was especially important during the phases of problem recognition and idea generation. In the present research, we investigated the effects of regulatory focus on managers' intention to solve problem creatively (Study 4) and assessed indirectly the effect of identified motivation on managers' innovative behaviors (Study 7).

## Attitudes

Attitudes are more proximal and evolutive antecedents of creativity than personality or cognitive factors. They can be defined as the latent disposition or tendency to respond with some degree of favorableness or unfavorableness to a psychological object (Fishbein & Ajzen, 2011). Attitudes result from the evaluation of cognitive, affective and experiential information regarding specific objects (Basadur & Basadur, 2011). Attitudes on peripheral objects of creativity have been studied such as attitude toward risk (e.g., Amabile, 1988), and attitude toward change in general (e.g., Ettlie & O'Keefe, 1982) or specific changes (e.g., Ellis & Webster, 1998). However, the main work on attitudes related to the creative process has been conducted by Basadur and his colleagues (Basadur & Finkneiner, 1985; Basadur & Hausdorf, 1996; Basadur, Taggar, & Pringle, 1999). Their research investigated attitudes toward different aspects related to creativity: ideation, premature convergence, time investing in creativity, or creative individuals. Results demonstrated that positive attitudes have a strong direct effect on managers' innovative behaviors and that attitudes could be improved when leaders experienced the creative process (e.g., Basadur et al., 1982). Following Fishbein and Ajzen (2011), we assume that attitudes are of primary relevance in predicting managers' engagement in creative actions. Effects of attitudes toward several creativity or situational objects on engagement in creative actions will be investigated in Chapter 5.

Personality, cognitive, conative and attitudinal attributes have showed significant effects on individuals' adoption of innovative behaviors and creative performance. In the present

research, we will seek to demonstrate that these attributes do not necessarily predict creative actions directly but facilitate managers' positive evaluation of the relevance of adopting creative actions in specific situations.

## Organizational characteristics

As highlighted by the componential and the interactionist theories (Amabile, 1983, 1988; Amabile & Pratt, 2016; Woodman et al., 1993; Woodman & Schoenfeldt, 1990), individual predispositions are more or less expressed depending on the individuals' environment. Organizations have the possibility to favor or impede creativity through their culture and climate (Tesluk, Farr, & Klein, 1997). Even though these two features are intrinsically related, they refer to different antecedents in terms of proximity (*ibid.*). The next sections will present a summary of research results regarding respectively the culture and the organizational climate for creativity and innovation. Nevertheless, most research focused on non-managers' creativity. However, we believe that results are similar, or even strengthened regarding managerial creativity because leaders are active actors of the organizational culture and climate, and because managerial creativity may result in improvements of those organizational features (Kwasniewska & Necka, 2004).

### Effects of corporate culture on organizational creativity

“Culture is the beliefs and values held by management and communicated to employees through norms, stories, socialization processes, and observations of managerial responses to critical events” (Tesluk et al., 1997, p. 27). Culture is decided and instilled by executives and developed over time. Organizations emphasize values that shape managers and employees' norms and behaviors. For example, organizations valuing change have greater chances to develop a culture of innovation than organizations valuing tradition (Kanter, 1988; King & Anderson, 1990). Indeed, valuing change makes the norms more favorable to leaders' innovative opinions, which consequently favor employees' expression of creative ideas (Kanter, 1988). Moreover, a culture that emphasized meritocracy - the extent to which organizations reward their employees for their performance rather than seniority, closeness with executives or unfair and unclear reasons – and pride in employees - translated in reward, recognition or communication of one's success – facilitates employees' creativity (Kanter, 1983, 1988; Mumford & Gustafson, 1988; Ramamoorthy, Flood, Slattery, & Sardesai, 2005).

In terms of practices in human resources, whether recruitment methods are more or less traditional and focused on creative skills shape the way individuals will perceive that creative behaviors are expected or not. Moreover, organizational creativity is influenced by the extent to which human resources' strategy pursue an objective of diversity in terms of employees' culture, background and skills (Anderson, Potočník, et al., 2014; Kanter, 1988; Zhang & Jia, 2010).

Culture is also expressed through managerial styles (Schein, 1990). Leadership has been widely studied as a lever or barrier of employees' creativity (Rosing et al., 2011). Transformational leadership has been found to facilitate every phase of creative and innovative processes (Reuvers, van Engen, Vinkenburg, & Wilson-Evered, 2008; Shung Jae Shin & Zhou, 2003). Transactional leadership appears to impede idea generation but facilitates idea implementation and exploitation (Jansen, Vera, & Crossan, 2009). Other factors such as creative leadership (Basadur, 2004; Stoll & Temperley, 2009), participative leadership (Somech, 2006), noncontrolling leadership (Oldham & Cummings, 1996), leaders' consideration (Osborn & Marion, 2009), and leader-member exchange (Basu & Green, 1997; Scott & Bruce, 1994) showed positive effects on collaborators' creativity and innovativeness. In contrast, when leaders exert a close monitoring on employees' work, it impedes their creativity (George & Zhou, 2001; Zhou, 2003).

Apart from the values, norms and leadership styles, organizations can develop strategies that focus on innovation. First, it is necessary that organizations allocate funds for innovation (Delbecq & Mills, 1985; Kanter, 1988). Second, the question of whether, and to what extent organizations should create a dedicated department for creativity and innovation has received contrasting answers. Galbraith (1982) argued that innovation requires different processes and should be isolated from other departments. Kanter (1988) acknowledged that segmentations of department and specialties hinder innovation. Because organizations need to work simultaneously on exploitation – the implementation and production of existing ideas and products; and exploration – the research of future products, opportunities and practices, they need to combine two different and conflicting processes (Bledow et al., 2009; Raisch & Birkinshaw, 2008; Tushman & O'Reilly, 1996). To do so departments of Production and Research and development should be distinguished but need to coexist and to communicate as much as possible. Moreover, close customer and user contacts (Kanter, 1988) are needed to update constantly awareness on users' needs and generate appropriate solutions. Customer services are more likely to facilitate product and technological innovations rather than



managerial innovation, but cross-disciplinary and external contacts contribute to organizational and managerial innovations (Amabile & Pratt, 2016; Anderson, Potočník, et al., 2014). Thus, individuals should be able to shift from exploration to exploitation departments as much as needed to generate ideas, and almost instantly experiment and confront the idea with the judgment of customer services. Regarding managerial innovation more specifically, leaders should have the freedom to experiment new managerial practices in either exploration or exploitation departments. However, every managerial activity does not inspire similarly managers' creativity (Caroff & Lubart, 2012) and leading individuals for creative efforts entails specific activities and behaviors that may increase managers' willingness to create and experiment new practices (see the section Creative leadership in the present document). Consequently, managers may find more favorable circumstances for creativity in departments of exploration. Thus, if organizations want to optimize their structure to improve and diffuse managerial creativity and innovation, they should develop a transversal communication between managers and encourage managers to shift departments for a short or intermediate period.

Moreover, the extent to which an organization's size or sector influences innovation has been widely studied but a review conducted by Damanpour (2010) suggests that no conclusion could be drawn based on current evidence. Regarding team size, the larger the teams are, the less individuals tend to express creativity (Curral, Forrester, Dawson, & West, 2001). The optimal size seems to be around 5 individuals, because smaller teams may lack the necessary skills and knowledge to be creative (Mumford & Hunter, 2005).

Finally, regarding employees' jobs, research highlighted that routinized and rigid jobs impede the spontaneous search for new ideas (Kanter, 1988). Moreover, creativity, as a requirement for one's work, does not seem to increase an individuals' creative performance (Amabile, 1983; Kanter, 1988). However, feeling that one's job is valued and secured helps individuals to allow themselves to diverge and express more original ideas (*ibid.*)

## The influence of organizational climate

Climate is the "psychological process that mediates the relationships between the work environment (conceived as an objective set of organizational policies, practices, and procedures) and work-related attitudes and behaviors." (Kopelman, Brief, & Guzzo, 1990, p. 295; cited in Tesluk et al., 1997). Climate is a reflection of the organizational culture as perceived by employees. It is a more proximal antecedent of individual creativity than

organizational culture. Consequently individuals in the same organization evolve in the same culture but do not necessarily perceive the same organizational climate. A climate for creativity corresponds to employees' perception of how the organization's values, practices, procedures and methods nurture and respond to creative ideas (Hunter, Bedell, & Mumford, 2005; Tesluk et al., 1997).

Research is abundant on the dimensions of the organizational climate that influence employees' creative performance and innovation. Based on several different theoretical frameworks, authors such as Amabile (e.g., Amabile & Conti, 1999), West (1990) and Ekvall (1996) developed models of multidimensional climate for creativity and innovation.

Amabile and colleagues (Amabile & Conti, 1999; Amabile, Conti, Coon, Lazenby, & Herron, 1996) identified 6 dimensions of the organizational climate that enhanced creativity by triggering intrinsic motivation toward creative tasks (e.g., *organizational encouragement, freedom, sufficient resources*) and 2 dimensions that impede creativity (*workload pressure* and *organizational impediments*). Based on this model, Amabile and colleagues developed a questionnaire (KEYS; Amabile, Burnside, & Gyskiewicz, 1995; Amabile et al., 1996) to assess employees' perception of these eight dimensions.

West and colleagues proposed a team-based approach model of organizational climate and identified 4 dimensions: *vision, participative safety, task orientation* and *support for innovation* (Anderson & West, 1998; West, 1990; West & Anderson, 1996). They developed an assessment tool: the Team Climate Inventory (TCI; *ibid.*). Ekvall (1996) focused on underlying psychological processes to present a nine-dimension model (e.g., *freedom, trust, playfulness* and *humour*) and developed the Creative Climate Questionnaire.

Hunter, Bedell and Mumford (2005) highlighted the relative disagreement on the nature and number of dimensions that constitute the organizational climate for creative. They reviewed forty-two articles that examined the relationship between organizational climate and creativity. Based on these different approaches and models, Hunter, Bedell & Mumford (2005, 2007) proposed a taxonomy of 14 dimensions of the organizational climate that could predict creative performance and innovation. Table 2 is a reproduction of the table presented in Hunter, Bedell, and Mumford (2007) that presents the fourteen dimensions, the operational definitions, and examples of climate dimensions from previous studies that are encompassed in the dimensions.

*Table 2.* Dimensions of the organizational climate for creativity identified in the taxonomy developed by Hunter, Bedell, and Mumford (2007)

Dimensions label	Operational definitions
Postive Peer Group	Perception of a supportive and intellectually stimulating peer group. Relationships are characterized by trust, openness, humor, and good communication.
Positive Supervisor Relations	Perception that an employee's supervisor is supportive of new and innovative ideas. Supervisor also operates in a non-controlling manner.
Resources	Perception that the organization has, and is willing to use, resources to facilitate, encourage and eventually implement creative ideas.
Challenge	Perception that jobs and/or tasks are challenging, complex, and interesting—yet at the same time not overly taxing or unduly overwhelming.
Mission Clarity	Perception and awareness of goals and expectations regarding creative performance.
Autonomy	Perception that employees have autonomy and freedom in performing their jobs.
Positive Interpersonal Exchange	Employees perceive a sense of “togetherness” and cohesion in the organization. Employees experience little emotional or affectively laden conflict in the organization.
Intellectual Stimulation	Perception that debate and discussion of ideas (not persons) is encouraged and supported in the organization.
Top Management Support	Perception that creativity is supported and encouraged at the upper levels of the organization.
Reward Orientation	Perception that creative performance is tied to rewards in the organization.
Flexibility and Risk-taking	Perception that the organization is willing to take risks and deal with uncertainty and ambiguity associated with creative endeavors.
Product Emphasis	Perception that the organization is committed to quality as well as originality of ideas.
Participation	Perception that participation is encouraged and supported. Communication between peers, supervisors and subordinates is clear, open, and effective.
Organizational Integration	Perception that the organization is well integrated with external factors (e.g., outsourcing) as well as internal factors (e.g., use of cross-functional teams).

To our knowledge, this taxonomy had not yet received empirical investigation and validation except for the meta-analysis conducted by Hunter et al. (2007) and the research that we conducted. Based on this taxonomy, we attempted to test the fourteen dimensions composing

the organizational climate for creativity and innovation and developed the French Organizational Climate for Creativity and Innovation Scale (OCCIS) (Caroff, Massu, & Krasteva, 2016; Caroff, Massu, Krasteva, & Houssin, 2015; Massu, Caroff, & Lubart, 2017). First, a questionnaire was created composed of items based on Hunter et al.'s (2005, 2007) definitions of the dimensions. After a phase of items selection, the final questionnaire is composed 24 items. Confirmatory factorial analyses did not support a 14 dimensions model and resulted in a bi-factorial model (Holzinger & Swineford, 1937) composed of a general factor loading all the items, and four group factors. Summaries of the questionnaire's development are presented in appendix 2.2. From the dimensions and items they entailed, the four dimensions have been respectively labeled: *Encouragement and organizational support*, *Positive interpersonal relations*, *Autonomy and challenge*, and *Mission clarity*.

*Encouragement and organizational support* refers to executives and managers support for creative initiatives, willingness to try new practices and to provide sufficient resources, recognition of individuals with creative ideas and the perception that the reward system focused on innovation rather than conformity. *Positive interpersonal relations* refers to the team climate where trust, communication, conflict solving and absence of negative judgment are emphasized. *Autonomy and challenge* refers to individuals' motivation, interest and freedom regarding his/her work. Finally, *Mission clarity* refers to organization's vision, use of human resources, and the clarity of instructions and individuals' knowledge of his/her objectives. The four dimensions have found previous and recent empirical support as enhancement factors of individual creativity and innovation (Massu et al., 2017). This scale will be used in several studies presented in this research to assess the organizational climate for creativity and innovation.

Following the call of Amabile (1983, 1988, Amabile & Pratt, 2016) and Woodman (Woodman et al., 1993; Woodman & Schoenfeldt, 1990), most research studied how the interaction between specific individual and organizational antecedents supported individual creativity and innovation (e.g., Goepel et al., 2012; Scott & Bruce, 1994). Regarding managerial creativity, little research investigated the simultaneous effects of individual and organizational characteristics and mainly focused on one aspect of the organizational climate. Scratchley & Hakstian (2001) demonstrated the positive effect of cognitive (divergent thinking abilities) and personality (openness) attributes. West and Anderson (1996) demonstrated that support for innovation and participation enhanced creative performances of teams of managers. Moreover, Kwasniewska & Necka (2004) demonstrated that managers

were more sensitive to organizational climate and tended to perceive the climate as more supportive for creativity than non-managers (see also Volberda, Van Den Bosch, & Heij, 2013). Finally, Vaccaro, Jansen, Van Den Bosch and Volberda (2012) showed that transformational and transactional leadership styles facilitated the exploration and exploitation of managers' new ideas.

Consequently, every stated variable has a potential influence on managers' engagement of creativity. Whereas certain may have stable effects across situations (e.g., personality traits), most antecedents may have more or less influence depending on the situation and the way these variables are considered by the individual when processing the decision to engage in creative behaviors (Damanpour & Aravind, 2011). Ford and Gioia (2000) studied the factors that influence managers' creativity. They asked 51 managers to describe decisions they made previously that led to either creative solutions (novel and valuable), novel but ineffective solutions, common but valuable solutions or common and ineffective solutions. Then, they asked respondents and a panel of management students to evaluate the extent to which each of the given solutions was creative (novel and valuable). These authors demonstrated that seven factors influenced the degree of creativity of managers' solutions: a) the importance they attributed to the problem that needed to be solved, b) the presence of common perspectives with their team, c) a lack of familiarity with existing solutions that would have inhibited their search of solutions with more uncertain outcomes, d) the perception that their environment trusts their ability to make decisions, e) the flexibility they have to undertake decisions in the organization, f) the absence of external forces such as events beyond control, and e) negative feedback which drives them to persevere. These results demonstrate the relevance of a multivariate approach to investigate the antecedents of managerial creativity. In Chapter 5, two studies investigate how certain individual (cognitive and conative) attributes and organizational climate simultaneously influence managers' sensemaking process leading to creativity.

## **Person-environment fit approach**

In the precedent sections, we reviewed individual and organizational characteristics that, in isolation or within a more complex model, have been found to influence individual creativity in organization. Yet, when managers engage in creative actions, it implies mostly that they will question the current practices of the organization. As a consequence, the correspondence

between managers and organizations' characteristics such as their agreement on the necessary resources for managers to be creative or their views on the guiding principles of managerial practices should influence the way managers will evaluate the potential outcomes and the necessity to engage in creative actions.

In this sense, an alternative to the interactionist approach to creativity is to focus on the person-environment fit perspective. The interactionist theory examines how individuals with predispositions are boosted or restrained by some characteristics of their organizations in their adoption of creative behaviors. In a distinct way, the person-environment (PE) fit approach investigates how specific characteristics of the individual correspond or complement organizational characteristics, and the subsequent effects of such correspondence on innovative behaviors. As stated by Mumford and Hunter (2005), "creative people are attracted to and likely to perform better in work environments consistent with their broader pattern of dispositional characteristics" (p.21). Moreover, Sternberg and Lubart (1995) evoked that resources such as individual and organizational characteristics should be studied in terms of their *confluence* because creativity involves more than a simple sum of such characteristics. Regarding these statements, relying on a PE fit approach enables the investigation of new perspectives on the interaction or confluence of variables as predictors of managerial creativity. Taking a PE fit perspective to investigate the antecedents of managerial creativity enables to identify a broader viewpoint on situations that have the potential to trigger managers' engagement in creative actions. In contrast with studies in Chapter 5, we conceive here that managers' creativity can be a) the result of an adequacy between their needs to be creative and the current climate of their organization, or b) the result of an inadequacy between the values that guide managerial practices for the manager and his/her organization. Moreover, in these two contexts, we posit that managers are still influenced by the relevance of the adoption of creative actions within their organizations.

The Person-Environment (PE) fit encompasses two different conceptual approaches: supplementary and complementary fit (Cable & Edwards, 2004; Edwards, 1996, 2007b; Muchinsky & Monahan, 1987). Supplementary fit concerns the extent to which individuals and organizations possess similar characteristics, goals, values, etc. (e.g., Cable & DeRue, 2002; Edwards & Cable, 2009; Kristof, 1996; Muchinsky & Monahan, 1987). Complementary fit focuses on the extent to which one's demands are fulfilled by the other's abilities or resources. This second approach distinguishes two types of fit based on whether the requirements are introduced by the organization or the individual. When organizations

place demands on the individuals in order to succeed in their tasks and individuals have the necessary skills, abilities; knowledge etc. to meet these demands, scholars call it a demands-abilities fit (Edwards, 1991, 1996, 2007a; Kristof, 1996; Livingstone, Nelson, & Barr, 1997). In contrast, when individuals have needs to perform or adopt specific behaviors and organizations fulfill these needs by supplying the necessary resources, the needs-supplies fit approach is relevant (Edwards, 2007a; Kristof, 1996; Livingstone et al., 1997).

Scholars started only recently to examine creativity through a PE-fit perspective. Livingstone and Nelson (1994) proposed to investigate how organizational creativity could result from a fit between organizational support for creativity and individuals' desire of such support, and simultaneously from a fit between organizational demands for creativity skills, task knowledge and intrinsic motivation and individuals' related abilities. Shortly afterwards, the authors demonstrated the effect of a fit between organizational climate and individuals' related needs on creative performance (Livingstone et al., 1997). Results show that creativity was enhanced when organizational supplies correspond to individuals' values and was greater when individuals' values and organizational supplies were high. Choi (2004) obtained similar results.

Puccio, Talbot, and Joniak (2000) studied the fit of problem-solving styles. They found that individuals who had similar problem-solving styles to those of their environment (adaption or innovation, assessed by the Kirton Adaption-Innovation scale, Kirton, 1976) had a greater creative performance. Other studies focused on the adequacy between individual and organizational values. Sarac, Efil, and Eryilmaz (2014) showed that creativity increased as organizations and individuals attributed similar and high importance to conformity. As surprising as it appears, such results may be explained by the fact that conformity value was related in this study to team-orientation, tolerance and easygoing. Moreover, Spanjol, Tam and Tam (2014) found that a fit between organization and individuals' values related to environmental issues predicted employees' creativity. More precisely, individuals were more satisfied and reported beliefs that are more positive about creativity in their work when they and their organizations had congruent and high concerns for the environment than when they had congruent but low concerns.

Consequently, the application of fit approaches to investigate antecedents of creativity in organizational contexts has started to prove its relevance and needs further empirical support. In this line of work, two studies have been conducted examining respectively the complementarity of needs and supplies for organizational climate (Study 6) and the adequacy

of values guiding managerial practices (Study 7) on managers' innovative behaviors. These studies are presented in Chapter 6.

## Research program

The general aim of the present research is to investigate circumstances triggering managers' engagement in creative actions through three chapters that present seven experimental studies. We primarily conceive that creative actions result from a sensemaking process that assesses the relevance of creativity with regard to the favorable conditions that are present. Thus, the sensemaking process, and indirectly the creative actions are assumed to be influenced by individual and organizational characteristics.

Chapter 3 will investigate how managers conceive managerial creativity and innovation. The objectives are to examine the content and dimensionality of managers implicit theories of creativity and innovation related to their activities (Study 1) and of a creative manager (Study 2), as well as to test whether different conceptions of creativity lead to different evaluations of the creative manager and creative practices, and differential adoption of innovative behaviors (Study 3). Implicit theories of creativity are conceived as part of the sensemaking process (e.g., Drazin et al., 1999). Consequently, we investigate in the present research the content and effect of implicit theories on creative actions but we did not inspect how implicit theories could be influenced by individual or organizational characteristics. The aim of this chapter is to understand better how creativity is related with managerial activities, to identify a potential bias that managers could hold against creativity or, conversely, positive or accurate conceptions enhancing the relevance of creativity in management.

In Chapter 4, we investigate how managers' engagement in specific creative actions results from leaders' evaluation of their relative ability and the potential consequences of doing so. Moreover, we postulate that such evaluation will be influenced by specific individual and organizational. First, Study 4 tested how individual and organizational characteristics can influence the sensemaking process leading managers to solve problems creatively in their daily activities. Moreover, following the assumption that managers tend to reproduce existing practices rather than creating new ones because they lack familiarity with the ideation-evaluation miniprocess of creative problem-solving (Basadur, 2004), we created an exercise that enables managers to experience this miniprocess in order to respond to a management problem. Then we assessed how their performance and their appraisal of the miniprocess



influenced their decisions to reproduce it in their daily activities. Thus, we tested the effect of individual predispositions (motivation, attitudes and performance) as well as organizational characteristics (organizational climate for creativity and innovation) on managers' decision to solve problems by adopting the ideation-evaluation miniprocess in their daily-activities, and we postulate that this effect is mediated by managers' sensemaking process regarding the use of the miniprocess in their daily activities (specific attitudes toward the situation, norms and perceived control).

Second, Study 5 is based on the assumption that, besides the lack of familiarity with the creativity miniprocess, a potential restraint on managerial creativity is that managers do not perceive or seize the opportunity to act creatively when they are confronted to a conducive situation. To understand better the underlying reasons for this lack of recognition of opportunities, we confronted managers with an organizational change that has been demonstrated to question current managerial practices and thus to necessitate managerial creativity: the implementation of telework. The diffusion of telework is slow in French organizations and one the main reasons lies in managers' reluctance toward telework or toward questioning their current practices. Consequently, we examined the effects of individual (attitudes toward change and toward creativity) and organizational antecedents (organizational climate) on managers' intentions to adopt innovative behaviors in order to implement telework. Moreover, we postulate that these effects are mediated by managers' sensemaking process regarding the adoption of innovative behaviors to implement telework. Thus, studies presented in Chapter 5 investigate the complete path from individual and organizational characteristics on managers' adoption of innovative behaviors through a sensemaking process.

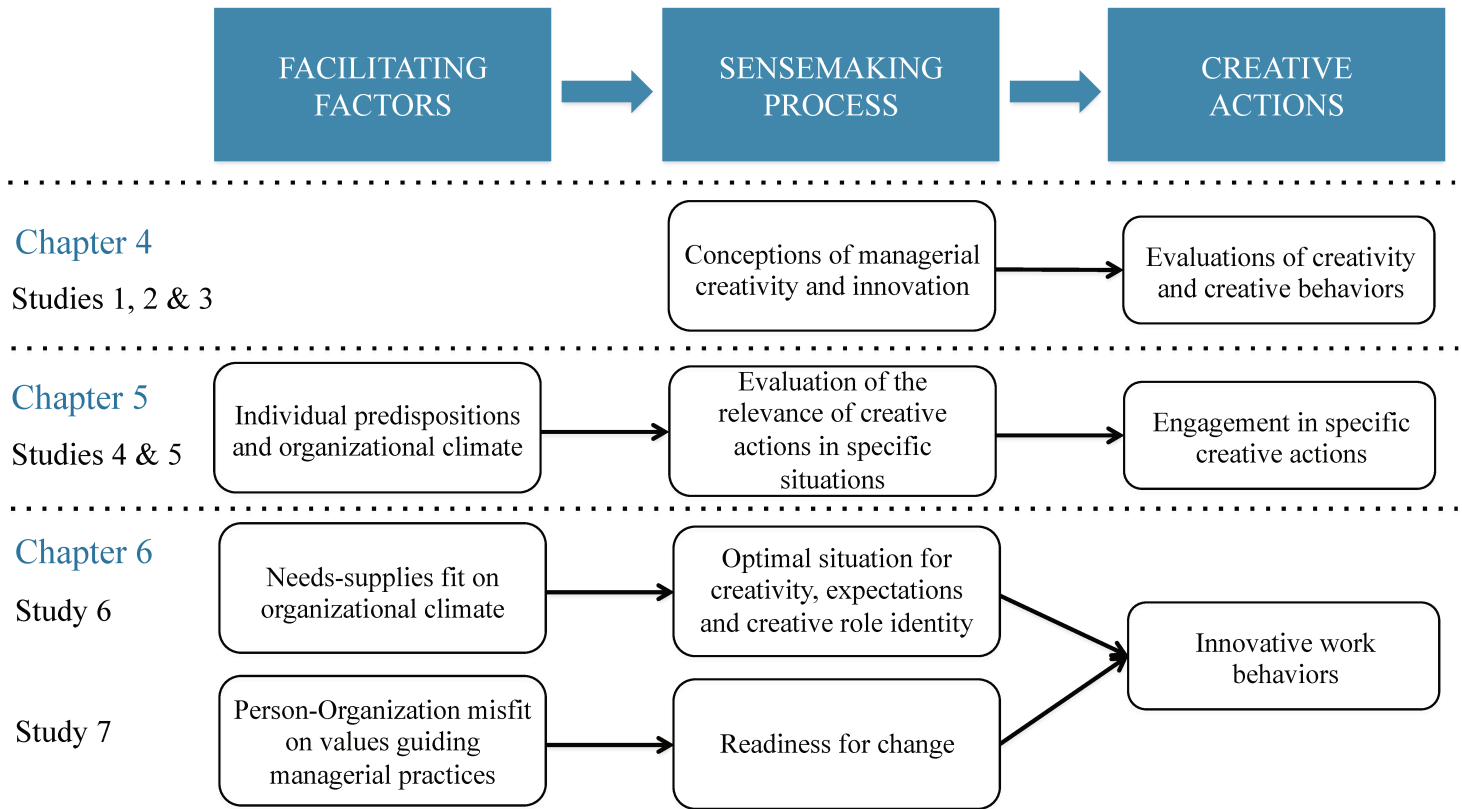
Finally, in Chapter 5 we investigate the antecedents of managers' innovative work behaviors by adopting a person-environment fit approach. Mumford and Gustafson (1988) noted that depending on the creative outcome that one wishes to develop, different contingencies on climate considerations might be more or less adapted. Thus, the impetus for Study 6 is that managers may differently necessitate organizational resources in order to act creatively and that an adequacy between managers' needs and organizational supplies is a better predictor of managerial creativity than the greatest amount of supplies. Moreover, we postulate that a fit between managers' needs and organizational supplies influences indirectly managers' innovative behaviors through several explanatory variables (job satisfaction, organizational commitment, creative self-efficacy and risk-taking). Study 7 takes an opposite perspective

and examines the effect of a person-environment misfit as a catalyst for leaders' dissatisfaction with the status quo and their decision to question existing practices and adopt innovative behaviors. Misfit was operationalized by examining the discrepancy between the importance that leaders and organizations assigned to specific values as guiding principles of managerial practices.

Taken all together, the present research investigates the effects of several individual, organizational and situational characteristics on managerial creativity through a sensemaking process (see figure 1). We conceive that individuals' predispositions, organizational climate and PE-fit situations are factors that have the potential to facilitate managers' engagement in creativity. However, we postulate that facilitating factors influence creativity by triggering managers' sensemaking of creative actions.

In figure 1, the term *sensemaking process* encompasses different group of variables. First, we included the implicit theories of creativity and innovation because these last are conceived as being influenced by individual and organizational characteristics but also leading to different interpretations of the relevance of creative actions (e.g., Drazin et al., 1999; Poole, Gioia, & Gray, 1989; Seligman, 2006; Weick, 1995). Second, we included the evaluation of the relevance of specific creative actions in specific situations that we assessed by relying on the Theory of Planned Behavior (Fishbein & Ajzen, 2011) as advised by Seligman (2006). Third, we posited that SN-fit could lead to an optimal situation for engaging of creative actions. This situation was assessed by several variables (e.g. affective commitment, creative self-efficacy). Thus, this conception is somewhat different from the theories on sensemaking process previously presented (Drazin et al., 1999; Ford, 1996) because it takes a broader and more optimistic view that managers will engage in creative actions because the optimal conditions are met (Weick, 1995). However, we also took into account in this third group of variables organizational expectations for creativity and managers' creative role identity. These variables are part of the sensemaking process as they are sources of relevance of creative actions. We postulated that managers in different situations of SN fit will be more or less inclined to engage in creative actions depending on the extent to which they emphasize creativity in their work or their organization expect them to be creative. Four, we included managers' readiness to change the prescribed practices as pertaining to the perceived relevance of innovative behaviors. In this way, we wish to contribute to the reflection on managerial creativity and innovation by testing different ways individual and organizational characteristics can influence managers' perceived relevance of engaging in creative actions.

Figure 1. Brief summary of the research program



## Notes on research methods

The seven studies presented in the present document relied on self-reports for two main reasons. The first is that we approached managerial creativity and innovation through the perspective of the individuals. As stated previously, we have a particular interest for managers' perceptions of several objects and their consequences on managers' decision to engage in creative action. Perception applies for example to their comprehension of creativity in their activities, their attitudes toward creative behaviors, and their abilities related to creative activities or their environment. Consequently, the present research did not seek to investigate the effects of objective characteristics of the individual or the organization on managers' creative actions but needed to question directly managers' subjective evaluations of different constructs. Second, we have a particular interest for managers' decision to act creatively. Such decisions do not necessarily imply to success and are largely personal. Thus, we relied on self-report measure of intentions or adoptions of innovative work behaviors. Self-report measure of creativity in organizations is the only way to capture managers'

deliberate intent to be creative and can be more appropriate than peer or supervisors' reports of one's behaviors because behaviors related to creativity are subtle and not always visible from an external point of view (Janssen, 2000; Shalley, Gilson, & Blum, 2009). For example, managers seeking numerous new solutions may not communicate about it or could prefer to be isolated when doing it. Consequently, their environment would underestimate such behaviors when assessing managers' creativity.

If self-reports were necessary to follow our approach, we are aware of the potential limitations of this method. First, McKibben and Silvia (2017) demonstrated that the validity of self-report measures of creativity was threatened by the potential inattentiveness of respondents when completing online surveys. From a brighter perspective, they demonstrated also that social desirability was a less important potential bias than expected. Moreover, Pretz and McCollum (2014) showed that self-perception of creativity assessed by self-report measure was a better predictor of creative performance in specific tasks than personality. We could thus expect that, as noted by Silvia, Wigert, Reiter-Palmon, and Kaufman (2012), "self-report creativity assessment is probably much better than creativity researchers think it is" (p. 19).

Second, using self-reports and online survey designs increase the probability of a common method variance (Podsakoff, MacKenzie, & Podsakoff, 2012; Podsakoff et al., 2003). When different constructs are measured through the same procedure, common method variance can occur and bias the reliability and validity of constructs assessment. Without controlling for the potential common method biases, analyses can lead to inflated correlations among variables as a consequence of the method used, and thus can lead to inaccurate interpretations. The extent to which common method variance is a real issue in cross-sectional designs have been discussed and some authors highlight that such biases are largely overemphasized in comparison to their real threat (e.g., Brannick, Chan, Conway, Lance, & Spector, 2010; Chan, 2009; Spector, 2006; Spector & Brannick, 2011). Nevertheless, we did our utmost to identify and control the potential common method biases in order to ensure the validity of our constructs and findings. Specific control methods and potential sources of bias are detailed for each study implying correlational analyses.

# Chapter 4: Implicit theories of managerial creativity

## Introduction

Following the findings of Mueller, Goncalo, and Kamdar (2011) on the negative relationship between creative performance and evaluation of leadership potential, as well as the worrisome absence of creativity in implicit leadership theories, we wish to investigate the implicit theories of management creativity and innovation. Implicit theories of managerial creativity and innovation are worth studying for several reasons.

First, studying implicit conceptions could help to develop scientific theories (Sternberg, 1985). Regarding research on creativity, Runco (1984; Runco & Johnson, 2002; Runco, Johnson, & Bear, 1993) considers that implicit theories are more ecologically valid than explicit theories. Thus, authors have relied numerous times on implicit theories to study how individuals were evaluated as creative. Studies of implicit theories of creativity, along with previous research, led to several scales used to evaluate a creative person (Gough, 1979; Runco, 1989; Runco et al., 1993; Sternberg, 1985). The interest for implicit theories as a means of questioning and developing scientific theories and knowledge received also particular attention in research on leadership (Larson, 1982; Rush, Thomas, & Lord, 1977; Van Quaquebeke, Graf, & Eckloff, 2014).

Second, implicit theories of managerial creativity are worth studying for themselves because their contents could be specific to the domain under study (Hass & Burke, 2016). In fact, several researchers demonstrated that implicit theories of creativity differ between people working in different professional domains, but also among domains of creative endeavor (e.g., Hass, 2014; Runco & Bahleda, 1986; Tang, Baer, & Kaufman, 2015). Thus, we cannot rely with certainty on implicit theories of a creative person in general to understand how a creative manager is characterized, and we must a priori consider that implicit theories of managerial creativity or of a creative manager may differ respectively from those of creativity or a creative person in general.

Third, these implicit theories of managerial creativity may influence how managers evaluate their peers as creative managers and managers' creative ideas. In research on creativity,

scholars rely primarily on experts' implicit theories of creativity in order to evaluate creative productions (e.g., Amabile, 1996; Kaufman, Baer, & Cole, 2009; Kaufman, Baer, Cole, & Sexton, 2008). Similarly in organizations, new managerial ideas that are recognized by others (peers and superiors) as creative have greater chances to be implemented (Baer, 2012). Such approbation follows rarely a strict process of evaluation and will always be influenced by the judge's implicit theories of creativity. Moreover, studies on implicit leadership theories have also demonstrated that implicit theories of leadership influence ratings of leadership skills (Den Hartog et al., 1999; Lord et al., 1984).

Finally, implicit theories of creativity could influence the way people behave (Kronberger, 2015). For example, Saunders Wickes and Ward (2006) demonstrated that highly intellectual teenagers reported different levels of creativity depending on the attributes they selected to characterize themselves as a creative person. To our knowledge, no study addressed the link between implicit theories of creativity among managers and their creative behaviors in organizational contexts. However, we may hypothesize that the way managers conceive creativity in their domain will influence their own creative behaviors.

To investigate leaders' implicit theories of creativity and innovation in relation with their role and activities, three studies were conducted. The first study explores managers' implicit theories regarding the concepts of creativity and innovation in relation to their activities. This study applied a methodology borrowed from the field of social representations theories that identifies the most prototypical attributes of creativity and innovation. The second focuses on implicit theories of the characteristics of a creative manager. Finally, the third study attempts to attest that managers' implicit theories influence their behaviors (Kronberger, 2015). More precisely, it investigates the relationship between leaders' implicit theories, their adoption of creative behaviors and their evaluation of a creative manager and creative managerial practices. The aim of this three studies is to apprehend how managers conceive creativity and innovation, as well as to attest that such conceptions influence their creative actions, as supposed in research on the sensemaking process of creativity (e.g., Drazin et al., 1999).

Creativity and innovation entail numerous objects of application such as a person, a product, a process or a press (Rhodes, 1961). However, implicit theories of creativity have mainly focused on the creative person. In a first part, we will present previous research that relates to our first study and investigated implicit theories of creativity or innovation in organizational contexts. In a second part, we will present research that focused on implicit theories of a person – a creative person or a leader, and that provide the background for our second study.

Implicit theories of creativity in general have been conducted in business, organizational or managerial contexts. They were mainly administered using open questions to investigate how business students (Petocz, Reid, & Taylor, 2009; Tsai & Cox, 2012), employees (Gondim et al., 2015), or managers (Szen-Ziemiańska, 2013) conceive creativity. Results of previous research show that lay conceptions reflected certain ideas found in explicit theories of creativity that we wish to present (Christensen, Drewsen, & Maaløe, 2014; Gondim et al., 2015; Petocz et al., 2009; Ramos & Puccio, 2014; Szen-Ziemiańska, 2013; Tsai & Cox, 2012).

First, implicit and explicit theories of creativity share the assumption that creativity refers to different objects. Since Rhodes (1961), it is admitted that explicit theories define creativity as an attribute that can characterize a person, a process, an environment or a product. Several studies identified implicit conceptions of creativity that referred to one or more of these four approaches to creativity (Petocz et al., 2009; Spiel & von Korff, 1998; Szen-Ziemiańska, 2013). For example, Gondim et al. (2015) observed that implicit theories of creativity among workers encompass environmental factors (e.g., the space and encouragement given to coworkers), and mostly dispositional factors (e.g., an internal capacity) referring to the person. Also, Petocz, Reid and Taylor (2009) interviewed business students and noticed that their implicit theories correspond to different levels of conceptions of creativity. At the broadest and most inclusive level, students' definition of creativity made references to three objects of applications (person, process, product) among the four P's (Rhodes, 1961). Thus, we expect that implicit theories of managerial creativity encompass attributes reflecting the different facets of creativity.

Second, regarding more specifically the creative product, implicit theories of creativity in organizational contexts comprise the features of originality and usefulness that are admitted as the essential characteristics of a creative production. However, in implicit theories of both creativity and innovation, usefulness appears largely underrepresented in comparison to the originality feature (Gondim et al., 2015; Ramos & Puccio, 2014). Nevertheless, without explicitly referring to usefulness, managers and business professors highlighted also the practical importance, thus the implementation and the practicality of creativity in organizations (Sternberg, 1985; Szen-Ziemiańska, 2013). The same prevalence of the originality feature was noted for the creative person. For example, taking Kirton's (1976) conception as a starting point for their research, Puccio and colleagues (Puccio & Chimento, 2001; Ramos & Puccio, 2014) found that laypersons perceived innovators (people described as creating original practices) as more creative than adaptors (people described as adapting existing practices) whereas both are conceived by Kirton (1978) as having similar levels of creativity.

Finally, studies on implicit theories of creativity in organizational contexts suggest that managers, employees and laypersons conceive creativity as tied to innovation (Gondim et al., 2015; Puccio & Chimento, 2001; Ramos & Puccio, 2014; Szen-Ziemiańska, 2013). Gondim et al. (2015) asked workers to indicate the meaning they attributed first to organizational creativity and then to organizational innovation. They noticed that even if only a small number of participants mentioned clearly a link between creativity and innovation, both concepts shared a substantial number of attributes (e.g., *novelty*, *individual predispositions*). These authors highlighted the need to explore how the two concepts are interconnected in implicit theories. Thus, in line with the work of Gondim et al. (2015), we wish first to investigate if managerial creativity and innovation share common attributes in implicit theories and which ones. Then, in order to improve our understanding of how creativity is related to innovation in managers' implicit theories, we will investigate the perceived structural link between the two concepts.

Studying how creativity and innovation are related in implicit theories could help interpret the content of managers' implicit theories, and may show a pro-innovation bias. This bias refers to the tendency, in research and real settings, to perceive innovation as invariably positive and thus to infer that creativity entails the same positive characteristics (Anderson, et al., 2014; Kimberly, 1981). The bias leads to perceive creativity and innovation as desirable components in an organization but it may also lead to underestimate in implicit theories the aspects related to creativity and innovation that are not always positively connoted (e.g., risk-taking, uncertainty) but are inevitably part of the innovation process.

In summary, previous studies suggest that implicit theories of creativity share substantial content with explicit theories. Nonetheless, as stated earlier, implicit theories of creativity are not generalizable and should be studied in specific domains. Szen-Ziemiańska (2013) investigated managers' implicit theories of creativity. She asked managers to define creativity. Words or expressions that were more frequently given were *creative thinking*, *innovation*, *problem solving* and *generation of new ideas*. She concluded that implicit theories were similar to explicit ones. However, she only focused on their general conception of creativity, which can entail conceptions related to employees' creativity or domains of application outside of the organization. By comparison, we seek to capture managers' implicit theories of creativity in the management domain.

In Study 1, we investigate implicit theories of creativity, as well as innovation related to managerial activities. Following most research, we hypothesize that implicit theories of



managerial creativity and innovation will reflect, at least to some extent, scientific knowledge. We investigate also the conceived relation between creativity and innovation. Indeed, considering the possible existence of a pro-innovation bias (Anderson et al., 2014; Kimberly, 1981), examining the extent to which managers perceive that creativity is linked to innovation will enrich our interpretation of the content and the structure of managers' lay conceptions.

Study 2 focuses on leaders' implicit theories of the characteristics of a creative manager. In order to understand better how conceptions of an effective leader can oppose, or at least differ from the conceptions of a creative individual, we can rely on the extensive literature on implicit theories of a creative person. Indeed, several studies examined implicit traits characterizing creative individuals in general (Christensen et al., 2014; Petocz et al., 2009; Runco, 1989; Sternberg, 1985). Sternberg (1985) investigated laypeople's implicit theories of an ideally intelligent, creative or wise person. His results show that attributes of a creative person referred respectively to three different dimensions: cognitive, non-cognitive and motivational. Moreover, Sternberg noticed that implicit conceptions of creativity overlapped those of intelligence, except that only creative people were perceived as able and willing "to go beyond ordinary limitations of self and environment and to think and act in unconventional and even dreamlike ways" (Sternberg, 1985, p. 622). Since this pioneering work, several studies aimed at identifying more specifically the characteristics of a creative person in different contexts (Christensen et al., 2014; Runco, 1989; Runco & Johnson, 2002; Runco et al., 1993). One approach consisted of asking lay people to select among the 300 attributes from the Adjective Check List (ACL; Gough & Heilbrun, 1965) those which characterized respectively a creative person and a non-creative one (e.g., Domino, 1970; Gough, 1979; Runco, 1989; Smith & Schaefer, 1969). Using this procedure, Gough (1979) identified eighteen discriminant adjectives (e.g., *Intelligent, Confident, Individualistic*) that were used to develop the Creative Personality Scale (CPS) but he did not investigate whether different dimensions structured these implicit attributes of a creative person. Thus, we do not know much about the dimensions that could structure the content of implicit theories of a creative person. Moreover, as stated previously, there may be doubts about the applicability of the CPS in organizational and managerial settings. Thus, the aim of the second study is to provide insights regarding these unanswered questions.

Finally, Runco and Johnson (2002), highlighted that one limit of research on implicit theories is the tendency to stay descriptive rather than seeking to explain behaviors. They suggested « to study the conceptions of creativity in conjunction with the observed behaviors of their

application » (Runco & Johnson, 2002, p.437). As we stated previously, studying the implicit theories of creativity was necessary for several reasons. Two of them are their effects on managers' evaluations and behaviors related to creativity. Indeed, judges rely on their subjective conceptions of what constitute creativity to evaluate the extent to which individuals or ideas are creative (e.g., Amabile, 1982, 1996; Hennessey, 1994; Kaufman, Plucker, & Baer, 2008). Moreover, Saunders, Wickes and Wards (2006) highlighted a correspondence between individuals' conception of creativity and the adoption of creative behaviors. Consequently, the third study investigates how implicit theories of creativity in the management domain influence leaders' innovative behaviors and their evaluations of creative managers and managerial productions.

## **Study 1. Implicit Theories of Creativity and Innovation in Management**

The first study investigates implicit theories of creativity and innovation among managers in relation to their managerial activities. In order to retrieve the most prototypical attributes of managerial creativity and innovation, we relied on the free association technique (e.g., Bonnet, Roussiau, & Vergès, 2002; Lo Monaco, Piermattéo, Rateau, & Tavani, 2017; Vergès, 1992), which has been developed within social representations theories (Moscovici, 2001, 2008). The concept of social representations was introduced by Moscovici (1961). It focuses on how individuals perceive an object of their reality and it follows the principle that our social relations, social membership, and social communication influence the way we perceive every object of our environment. Social representations can be defined as “systems of opinions, knowledge, and beliefs” (Rateau, Moliner, Guimelli, & Abric, 2011, p. 478). A representation is the product of an object encountering a population. It is a way to appropriate the world, a psychological and a social mechanism to manage the relations and reactions with our environment (Abric, 1987). Social representations of creativity have been previously studied by Glăveanu (2011). The author found that general creativity was mostly associated with the artistic field. Regarding social representations and leadership, Castel et al., (2007) relied on a methodology of social representations in order to identify, among the characteristics of an

effective leader (collected as implicit theories in the GLOBE study; House, 2004), the attributes that were the most prototypical for French managers.

Social representations are presumed to guide how individuals and groups behave toward the concept under study (Moscovici & Hewstone, 1983). With regard to this objective, different methods have been developed and validated that allow the structure of lay conceptions to be investigated in order to identify the sparse prototypical attributes that are referred to as the central core of social representations (e.g., Lo Monaco et al., 2017; Vergès, 1992). Unlike implicit theories, approaches to social representations do not investigate a large scope of individual's lay conceptions of an object but rather seek to identify the prototypical attributes of a concept that are socially constructed and shared among similar individuals (for a comparison between implicit theories and social representations, see Glăveanu, 2011). Because we want to investigate the extent to which creativity and innovation are closely related in managers' lay conceptions, we share the assumption of authors of social representations theory that few attributes are sufficient to capture the essence of managers' implicit conceptions of creativity and innovation. The free association task is a useful tool for collecting implicit or latent elements that are of primary importance for the individual. It allows identifying the few prototypical attributes of an object. Such attributes that are the core of the implicit representations of an object could be retrieved with other methods suggested in both field of research on implicit theories and social representations, such as open questions, but it would be more difficult to isolate them from other less important attributes (Abric, 2003). The free association task involves asking individuals to produce few words that come to mind when they think about an object (e.g., managerial creativity). No other constraint is then asked. The number of words required depends on the amount of information we want to collect. We followed the advice of Flament and Rouquette (2003) that "an investigation limited to 3 or 5 answers is often enough to carry an effective structural diagnosis" (p. 83). In this respect, the aim of the present research is to collect managers' implicit conceptions of creativity and innovation, but we seek to isolate conceptions that are prototypical rather than getting an exhaustive lists of creativity or innovation-related conceptions. Taking a broad definition of implicit theories as "constructions by people (whether psychologists or laypersons) that reside in the minds of these individuals" (Sternberg, 1985, p.608), conceptions that we are about to collect can still refer to implicit theories of creativity and innovation related to management.

In the pre-study, managers were randomly assigned to two conditions and asked to give words that, for them, characterize creativity (condition 1) or innovation (condition 2) in their

managerial activities. Because these two concepts are supposed to be related, it is not excluded that a word that has been spontaneously associated only with managerial creativity can nevertheless characterize also managerial innovation and vice versa. For this reason, after analyzing the collected attributes, we used the most prototypical attributes of creativity and/or innovation to create a scale. In the main study, a second group of managers, different from the previous one, rated the importance of those attributes to characterize managerial creativity (condition 1) or managerial innovation (condition 2). For both conditions, participants' ratings were factor analyzed to study the structure of the relationships between the different attributes. Given the lack of previous theoretical work or empirical research, our approach is exploratory. It aims at identifying the number and nature of the dimensions that structure the contents of the implicit conceptions of managerial creativity and managerial innovation. We can only assume different dimensions for these two implicit theories, and we will compare the structure of implicit theories for the two concepts. To investigate further the structural nature of the two implicit concepts, managers completed a questionnaire to assess the logical relation they perceived between creativity and innovation.

## **Pre-study: Collecting attributes of managerial creativity and innovation**

### **Participants**

Managers were solicited through messages posted on professional and business-related social media networking sites (e.g., internal websites in companies, LinkedIn, Viadeo) or sent on managers' professional mailing addresses that were available. Content of these messages asked managers to participate to an online survey, created on Limesurvey<sup>®</sup>, that addresses their perception of creativity (or innovation) in managerial activities. No other criteria than being a manager and speaking French were used to select participants. Participants were 244 French managers from different French organizations. These managers worked in more than 30 different sectors (those principally represented were finance, transport, and health). One hundred twenty-two managers ( $M_{age} = 41.85$ ;  $SD_{age} = 10.62$ ; 41.85% women, mean years of managerial experience = 10.73;  $SD_{exp} = 8.89$ , mean number of collaborators under supervision = 23;  $SD_{coll} = 37.90$ ) were randomly assigned to the first condition and 122 managers ( $M_{age} = 42.64$ ;  $SD_{age} = 11.32$ ; 40.98% women, mean years of managerial

experience = 10.31;  $SD_{exp} = 8.54$ , mean number of collaborators under supervision = 24;  $SD_{coll} = 95.01$ ) were randomly assigned to the second condition.

## Procedure

Two online surveys were designed on Limesurvey<sup>®</sup> to collect the content of implicit theories respectively for creativity in the first condition, and innovation in the second condition. For each condition, the surveys were globally designed in the same way. First, participants had to answer biographical questions (sector of activity, age, sex, years of managerial experience and number of collaborators under supervision). Then, using a free association technique (e.g., Bonnec et al., 2002; Lo Monaco et al., 2017; Vergès, 1992), participants were asked to provide four words or expressions that, for them, characterize either creativity (condition 1) or innovation (condition 2) in relation to their managerial activities. They had to write down those four words or expressions as they came to their mind. Then, participants were offered the possibility to reorder the four words or expressions they had given according to their relative importance (57% did not reorder the words).

In total, for both conditions, 976 words or expressions were collected. We asked two judges<sup>4</sup> to lemmatize independently the terms following the procedure proposed by di Giacomo (1980) and the classical standards of content analysis (Rosenberg & Jones, 1972). At the end of this process, a category of terms grouped together (1) the verbs, names and adjectives of the same lemma (for example; the expressions “to be curious”, “curious” and “curiosity” were regrouped in a same category); (2) terms modified by adverbs (for example: “very curious” and “curious”) and (3) words or expressions with an analog meaning (for example: “360 evaluations” and “360 analysis”). The inter rater reliability can be considered as acceptable (Cohen’s Kappa,  $\kappa = .75$ ). An experienced judge, very familiar with the procedure, lemmatized again the terms on which both judges initially disagreed. The content analysis resulted in 348 attributes characteristic of creativity and/or innovation in managerial activities. At the end, attributes cited by less than two participants were removed from the list, resulting in 87 attributes of creativity and 87 attributes of innovation (see Appendices 3.1. and 3.2.).

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<sup>4</sup> The two judges were PhD candidates studying creativity.

## Results

The analysis of the collected words or expression applied the tiered evocation technique (Abric, 2003; Vergès, 1992). Thus, we calculated two statistical indices for each word or expression: the number of times they have been evoked across all participants (attribute frequency), and the mean apparition rank in participants' initial productions or reordering (attribute importance). To limit the number of words used in the second part of the study, we selected only words or expressions satisfying one of the two criteria: (1) words that had a frequency superior to the median frequency (which equaled 4 for the present data), or (2) words that had a frequency equal to the median frequency and a range of importance superior to the sample median value ( $Mdn = 2.5$ ; 1 being the most important and 4 the least). This new sorting resulted in 24 prototypical attributes in Condition 1 (managerial creativity) and 25 prototypical attributes in Condition 2 (managerial innovation).

Among these 49 attributes collected in the two conditions, Creativity and Innovation concepts encompassed 37 distinct attributes and 12 attributes present in both lists (representing approximately 25% of common attributes among both lists). Prototypical attributes common for Creativity and Innovation were *openness, curiosity, moving outside the framework, imagination, anticipation, listening, adaptability, motivation, change, vision, communication, and novelty*<sup>5</sup>. In contrast, attributes that are only associated with Creativity were, in decreasing order of frequency, *interaction, idea, brainstorming, proactivity, proposition, innovation, dynamic, participation, organization, trust, initiative* and *sharing*. Attributes associated only with Innovation were *creativity, future, improvement, transversality, creation, courage, questioning, audacity, research, training, progress, accompaniment, and goal*.

Results show that implicit conceptions of Creativity and Innovation related to managerial activities share a large number of common attributes. Nevertheless, noticing that the two implicit concepts imply approximately 25% of similar attributes does not lead to the conclusion that managers perceive the relation between creativity and innovation as scientific researchers do. This issue is addressed in the second part of this study.

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<sup>5</sup> Attributes were translated from French to English by the authors.

## Main study: Investigating the relation between implicit theories of managerial creativity and innovation

The objective of the next part of the study is twofold: to investigate the structure of prototypical implicit theories of respectively managerial creativity and innovation, and investigate the conceived link between these two concepts. First, we asked managers to rate all the attributes that compose implicit theories of Creativity and Innovation to outline the dimensional structure of their respective content. Second, the same managers were asked to rate all the logical relations that could be envisioned between conceptions of creativity and innovation.

### Participants

Invitations were sent to managers for participating to an online survey, created on Limesurvey<sup>®</sup>. They were posted on professional and business-related social media networking sites and sent to available professional email addresses. These messages stipulated that the survey concerned only managers who were speaking French and addresses their perception of creativity (or innovation) in managerial activities. No other criteria were applied to select participants.

Among the 322 managers who accessed the survey, 166 completed it (52%). Their mean number of years of managerial experience was 13.26 ( $SD = 9.82$ ) and the mean number of collaborators under their supervision was 29 ( $SD = 119$ ). This sample of managers exercised in more than 25 different sectors (sectors principally represented were finance, administration, and communication). We assigned randomly participants to one of the two conditions, either creativity or innovation. Seventy-seven managers ( $M_{age} = 43.13$ ;  $SD_{age} = 13.17$ ; 35.06% women, mean years of managerial experience = 13.15;  $SD_{exp} = 10.32$ , mean number of collaborators under supervision = 17;  $SD_{coll} = 41.48$ ) were randomly assigned to the first condition and 89 managers ( $M_{age} = 46.83$ ;  $SD_{age} = 12.34$ ; 44.94% women, mean number of managerial experience = 13.36;  $SD_{exp} = 9.42$ , mean years of collaborators under supervision = 26;  $SD_{coll} = 71.54$ ) were assigned to the second condition.

## Material and procedure

Participants completed an online questionnaire designed on Limesurvey<sup>®</sup> composed of three parts. In the first part, we asked participants to provide demographic information (age, number of job tenure, sector of activity, manager seniority, and the number of subordinates).

In the second part, participants rated the identified attributes in relation to either creativity (condition 1) or innovation (condition 2). Two versions of a questionnaire were created, both composed of the list of 37 attributes (in condition 1, we removed the attribute *creativity* and in condition 2, we removed *innovation*), resulting in a list of 36 attributes in both conditions. These questionnaires were designed based on the test of context independence (Lo Monaco, Lheureux, & Halimi-Falkowicz, 2008). This allows identifying the most stable elements that are insensitive to changes in immediate context (Lo Monaco et al., 2017). In condition 1, participants rated to what extent each attribute was “always, in every case, characteristic” of creativity in relation to managerial activities; in condition 2, participants answered a similar question except that it referred to innovation. Participants’ ratings were collected using a scale ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*).

In the third part of the questionnaire, participants rated all the logical relations that could link creativity to innovation in managerial activities. Items were constructed following the basic cognitive schemes methodology (e.g., Fraïsse & Stewart, 2002; Guimelli & Rouquette, 1992; Lo Monaco et al., 2017). This methodology postulates that the relations between two objects, A and B, should be investigated from five different types of schemes: (1) Lexical scheme: “Are the objects A and B equivalent, in opposition or similarly defined?” (2) Proximity scheme: “Is A included in B?” (3) Composition scheme: “Does A compose B or do A and B compose a third object?” (4) Attribution scheme: “Does A characterize or is characteristic of B?” and, finally, (5) Praxis scheme: “How does A act on B?”. Following Guimelli and Rouquette (1992), we created two questionnaires of 28 items representing respectively these five basic cognitive schemes. In the first condition, throughout the 28 items, the object A corresponded to Creativity and the object B corresponded to Innovation. For each kind of scheme, examples of items are the following: “Creativity can be defined as innovation” (Lexical scheme); “Creativity is part of, is included, is an example of innovation” (Proximity scheme); “Creativity and innovation are both components of the same thing” (Composition scheme); “Creativity is often characterized by innovation” (Attribution scheme); “It is creativity that makes innovation” (Praxis scheme). The 28 items composing the questionnaire are presented in Table 3. In the second condition, the same kinds of items were presented except that the order of



presentation of both concepts was reversed in each proposition: object A corresponded to Innovation and object B corresponded to Creativity. In both conditions, participants were asked to rate the 28 propositions with three possible answers: “Yes”, “No”, “I do not know”.

## Results

### Dimensionality of the implicit conceptions of creativity

We examined the factorability of the 37 attributes using several criteria. Even though our sample of managers could be considered relatively small, the KMO measure of sampling adequacy coefficient was good (.72), and Bartlett’s Test of Sphericity was significant ( $\chi^2(630) = 1757.08, p < .001$ ), indicating that the correlation matrix was not random. The MSA for each attribute varied between .46<sup>6</sup> and .84 (*Mdn* = .72), supporting the inclusion of each item in the factor analysis.

A principal component analysis was chosen because the objective of the analysis was not to identify and measure latent variables, but to analyze the structures of the relationships between the attributes that characterize implicit conceptions of creativity. From the initial solution, Horn’s parallel analysis (Horn, 1965) with 1000 replications indicates that only the first three factors should be extracted, explaining 47% of the variance.

For this three-component solution, two attributes had communalities inferior to .30: *Participation* (.16) and *Communication* (.27). However, removing these two items led exactly to the same factor structure but with slightly different factor loadings. Therefore, conserving all the initial items, we extracted and rotated (promax) the three factors to explore the multidimensional structure of the attributes of implicit conceptions of creativity related to managerial activities. The factor loadings matrix for this final solution is presented in Table 3.

For the first component, the attributes with the highest loadings ( $|l| > .60$ ), in decreasing order of value, were: *transversality*, *moving outside the framework*, *interaction*, *openness*, *questioning*, *sharing*, *curiosity* and *propositions*. This component can be interpreted as a “Predispositions for managerial innovation” dimension. For the second component, the attributes with the highest loadings were: *organization*<sup>7</sup>, *anticipation*, *goal*, *accompaniment* and *training*. This component

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<sup>6</sup> Only the item *Communication* had a MSA slightly inferior to .50. We decided to include it in further analyses in order to compare the structures of implicit theories of managerial creativity and innovation composed on similar items.

<sup>7</sup> Organization refers here to the action of organizing something rather than the company.

can be interpreted as “Creative leadership skills” as it involves skills that are useful to accompany the development of others’ creativity. Finally, for the third component, *idea, progress, innovation, novelty, creation* and *future* were the attributes with the highest loadings. This component can be interpreted as a dimension focusing on “Creative products”. The correlations between the three components are all relatively homogenous, within a .35-.45 range.

*Table 3.* Factor loadings and communalities based on a principle components analysis with promax rotation for 35 words or expressions associated with Creativity (N = 88)

	Comp.1	Comp.2	Comp.3
transversality	.78		
moving outside			
the framework	.76		
interaction	.70		
openness	.63		
questioning	.62		
sharing	.61	.35	
curiosity	.61		
proposition	.60		
imagination	.54	-.54	.41
trust	.54		
brainstorming	.52		
audacity	.44	.36	
participation	.40		
change	.40		.36
listening	.39	.35	
organisation		.85	
anticipation		.70	
goal		.68	
accompaniment		.68	
training		.66	
dynamic		.58	
motivation		.56	.36
courage		.51	.42
initiative		.48	.39
proactivity		.45	.34
communication	.31	.41	
idea			.82
progress			.77
innovation			.71
novelty			.71
creation			.69
future			.62
improvement			.53
research		-.32	.48
adaptability		.32	.46
vision			.38

*Legend.* Comp.1 = first component, Comp.2 = second component, and Comp.3 = third component.

*Notes.* For all components, attributes are presented in order of their highest loading and loadings < .30 have been suppressed.

## Dimensionality of the implicit conceptions of innovation

To explore the factorability of attributes characterizing Innovation (condition 2), we replicated the same analyses as in Condition 1. The KMO measure of sampling adequacy coefficient was good (KMO = .73), and Bartlett's Test of Sphericity was significant ( $\chi^2(630) = 1841.59$ ,  $p < .001$ ), indicating that the correlation matrix was not random. The MSA for each variable varied between .51 and .83 ( $Mdn = .73$ ), supporting the inclusion of each item in the factor analysis. From the initial solution, Horn's parallel analysis (Horn, 1965) with 1000 replications indicated that only the first three factors should be extracted, explaining 45% of the variance.

For this three-component solution, four attributes had communalities inferior to .30: *questioning* (.14) *moving outside the framework* (.26), *research* (.28), and *proactivity* (.27). Removing these four items led exactly to the same factor structure and slightly different factor loadings. Therefore, conserving all the initial items, we extracted and rotated (promax) the three factors to explore the multidimensional structure of the attributes of implicit conceptions of innovation related to managerial activities. The factor loadings for this final solution are presented in Table 4.

For the first component, the attributes with the highest loadings ( $I > .60$ ), in decreasing order of value, were *creativity*, *creation*, *imagination*, *audacity* and *curiosity*. This component can be interpreted as a "Creativity" dimension. For the second component, the attributes with the highest loadings were *listening*, *accompaniment*, *interaction*, *trust* and *sharing*. We can describe this dimension as "Leadership qualities". Finally, for the third component, *motivation*, *adaptability* and *courage* are the attributes with the highest loadings. This component can be designated as an "Implementation skills" dimension. The correlations between the three components are less homogenous than those observed for the factor analysis associated with creativity, within a .05-.31 range.

*Table 4.*Factor loadings and communalities based on a principle components analysis with promax rotation for 35 words or expressions associated with Innovation (N = 88)

	Comp.1	Comp.2	Comp.3
creativity	.84		
creation	.81		
imagination	.78		
audacity	.73		
curiosity	.65	.36	
novelty	.59		
openness	.55	.48	
brainstorming	.54		
idea	.53		
vision	.49		.39
research	.48		
change	.46	-.30	
moving outside the framework	.42		
listening		.78	
accompaniment		.74	
interaction		.74	
trust		.68	
sharing		.62	
training		.59	
communication	-.32	.59	
organisation		.58	
participation		.57	
transversality	.31	.54	
proposition	.36	.47	
questioning		.32	
motivation			.73
adaptability			.61
courage			.61
anticipation			.58
goal	-.36	.35	.57
dynamic			.55
progress	.34		.55
future		-.34	.54
improvement			.52
proactivity			.40
initiative	.31	.37	.37

Legend : Comp.1 = first component, Comp.2 = second component, and Comp.3 = third component.

*Notes.* For all components, attributes are presented in order of their highest loading and loadings < .30 have been suppressed.

## Analysis of results for the Basic Cognitive Scheme

The frequencies of answers for the 28 items assessing respectively each basic cognitive scheme are presented in Table 5. To ease the presentation of the results, the different propositions are shown in the first column with letters A and B indicating either creativity or innovation. In the first condition, A and B corresponded respectively to *creativity* and *innovation*, whereas in the second condition, A corresponded to *innovation* and B to *creativity*. The next columns of Table 5 indicate respectively, and for each condition, the percentages of responses *Yes*, *No* and *Do not know*, and Pearson chi-square for the difference between the frequency of *Yes* responses and the frequency of the two other responses together. Moreover, Pearson chi-squares comparing the frequencies patterns of *Yes* versus other responses between the two conditions are presented in the last column of Table 5.

Table 5. Percentages of responses for the different kinds of cognitive schemes and for the two conditions

	Creativity condition (N = 77)				Innovation condition (N = 89)				Comparison $\chi^2$ value <sup>2</sup>
	Pct. of responses			Yes vs. others $\chi^2$ value <sup>1</sup>	Pct. of responses			Yes vs. others $\chi^2$ value <sup>1</sup>	
	Yes	No	NSP		Yes	No	NSP		
Related to managerial activities...									
<i>Lexical</i>									
1. A has the same meaning as B	29.2	66.7	4.2	12.50***	31.8	67.0	1.1	11.64***	.13
2. A can be defined as B	34.7	63.9	1.4	6.72**	38.6	59.1	2.3	4.55*	.26
3. A is the opposite of B	0.0	97.2	2.8	- - -	1.1	94.3	4.5	84.05***	.82
<i>Proximity</i>									
4. A is included, is an example of B	86.1	12.5	1.4	37.56***	81.8	15.9	2.3	35.64***	.54
5. A has for example, for particular case, include B	73.6	22.2	4.2	16.06***	67.0	23.9	9.1	10.23***	.81
6. A belongs to the same general category as B	56.9	37.5	5.6	1.39	68.2	25.0	6.8	11.64***	2.15
<i>Composition</i>									
7. A is a component, a constituent of B	79.2	15.3	5.6	24.50***	65.9	29.5	4.5	9.91***	3.44
8. A has for component, for constituent B	59.7	33.3	6.9	2.72	67.0	26.1	6.8	10.23***	.92
9. A and B are two components of the same thing	48.6	38.9	12.5	.56	40.9	47.7	11.4	2.91	.95
<i>Attribution</i>									
10. A is always characterized by B	20.8	73.6	5.6	24.50***	52.3	42.0	5.7	.18	16.59***
11. A is often characterized by B	70.8	26.4	2.8	12.50***	80.7	13.6	5.7	33.14***	2.12
12. A is sometimes, eventually characterized by B	83.3	11.1	5.6	32.00***	69.3	21.6	9.1	13.14***	4.22*
13. A must product B	37.5	58.3	4.2	4.50*	27.3	64.8	8.0	18.18***	1.91
14. B evaluates A	30.6	54.2	15.3	10.89***	29.5	54.5	15.9	14.73***	.02
15. A have for consequence or goal, result in B	66.7	23.6	9.7	8.00***	42.0	48.9	9.1	2.23	9.64***
16. A has for cause, depends on, comes from B	26.4	56.9	16.7	16.06***	64.8	23.9	11.4	7.69**	23.40***
<i>Praxis</i>									
17. A builds B	73.6	23.6	2.8	16.06***	27.3	68.2	4.5	18.18***	34.06***
18. A acts on B	94.4	1.4	4.2	56.89***	60.2	35.2	4.5	3.69	25.15***
19. A uses B	48.6	41.7	9.7	.06	89.8	6.8	3.4	55.68***	32.75***
20. It is A that set about B	66.7	23.6	9.7	8.00***	19.3	76.1	4.5	33.14***	36.80***
21. A is an action that applies on B	55.6	30.6	13.9	.89	37.5	47.7	14.8	5.50*	5.20*

	Creativity condition (N = 77)				Innovation condition (N = 89)				Comparison $\chi^2$ value <sup>2</sup>
	Pct. of responses			Yes vs. others $\chi^2$ value <sup>1</sup>	Pct. of responses			Yes vs. others $\chi^2$ value <sup>1</sup>	
	Yes	No	NSP		Yes	No	NSP		
22. To develop A we use B	47.2	48.6	4.2	.22	93.2	4.5	2.3	65.64***	41.95***
23. B acts on A	62.5	30.6	6.9	4.50*	92.0	5.7	2.3	62.23***	20.66***
24. B designates an action that we can do on (about, related to) A	52.8	33.3	13.9	.22	60.2	21.6	18.2	3.68	.90
25. B is a tool that we use on (about, related to) A	43.1	38.9	18.1	1.39	73.9	17.0	9.1	20.05***	15.66***
26. A is used by B	75.0	18.1	6.9	18.00***	51.1	40.9	8.0	.05	9.56***
27. We use A to develop B	91.7	4.2	4.2	50.00***	44.3	47.7	8.0	1.14	39.36***
28. A is a tool that we can use for B	95.8	2.8	1.4	60.50***	53.4	40.9	5.7	20.05***	35.75***

Legend: \* significant at .05, \*\* significant at .01, \*\*\* significant at .001.

<sup>1</sup> Pearson chi-square for the difference between the Yes responses and the two others

<sup>2</sup> Pearson chi-square for the difference between the frequencies of responses in the two conditions (Creativity and Innovation)

*Note.* In the Creativity condition, for each cognitive scheme, A = creativity and B = innovation; in the Innovation condition, for each cognitive scheme, A = innovation and B = creativity.



The following synthesis will comment on the results obtained for the different items by referring to their line number. For *Lexical* schemes, results obtained in both conditions show that participants conceive that creativity and innovation do not have the same meaning, but they are not opposed (see results for schemes 1, 2 and 3). Results obtained for *Proximity* and *Composition* schemes are more puzzling. Some of these schemes concern interlocking logical structures. However, if we compare results for schemes 4 and 5 in each condition, as well as for schemes 7 and 8 in condition 2, we notice that participants state significantly that creativity is a component of innovation and, at the same time that the reverse proposition is true. Thus, participants approve significantly both possibilities of inclusion between the concepts of creativity and innovation.

Schemes in the *Attribution* section clarify the perceived relation between both concepts and corroborate results obtained for the *Lexical* section. Indeed, even though creativity and innovation are often characterized by each other (see results for schemes 11 and 12), creativity is not always characterized by innovation. Interestingly, opinions are more divided on whether innovation is always or not characterized by creativity (scheme 10). When looking more precisely at how the two concepts function together, it appears clearly that creativity causes, or has for consequence Innovation but not vice versa (schemes 15 and 16). Moreover, the *Praxis* section helps clarify this causal relationship. Participants consider significantly that creativity builds innovation (scheme 17) whereas innovation uses creativity (scheme 19). Finally, if creativity is without any doubt considered to be used to develop innovation, the opposite is still not clearly rejected (scheme 22, 23). Perhaps this divided opinion emerges from the conception that innovation is a tool that can be used in order to develop creativity (scheme 27). Such results lead to the conclusion that managers' implicit theories imply that managerial innovation will undoubtedly emerge from creativity whereas managerial creativity can have several consequences in organizations.

## Discussion

The results from this first study show that implicit conceptions include the attributes *novelty* and *adaptability*, which are the two criteria used mainly by researchers to define, and even assess, creative productions (e.g., Amabile, 1988), managerial creativity and innovation (Birkinshaw et al., 2008; Scratchley & Hakstian, 2001). This corroborates previous results from research on implicit theories of creativity that retrieved also these two essential components (e.g., Paletz & Peng, 2008). Moreover, *openness* appears as a prototypical attribute of creativity

and innovation, which corresponds to previous implicit theories of employee creativity (Christensen et al., 2014) and explicit theories of managerial creativity and innovation (McCrae, 1987; Scratchley & Hakstian, 2001). In addition, both lists of attributes include *motivation*, which is consistent with Amabile's componential theory of creativity (Amabile, 1983) and the Investment theory (Sternberg & Lubart, 1993) in terms of individuals' motivation as a driver of creativity and innovation in organizations.

Several attributes of Creativity and Innovation call to mind the different steps of the creative and innovative processes. For example, (1) *Curiosity, idea, moving outside the framework, and brainstorming* evoke the Idea generation step. (2) *Questioning, proposition, goal, and improvement* evoke Idea selection. (3) *Interaction, communication, participation, sharing, dynamic, and disponibility* evoke Idea Promotion. Finally, (4) *accompaniment, change, improvement, and rigor* evoke Implementation.

Some results call also to mind the 4P approach of creativity from Rhodes' (1961) conception. Indeed, some attributes such as (1) *openness, curiosity, imagination, and rigor* refer to the characteristics of the Person, (2) *communication, accompaniment, brainstorming, and transversality* refer to the creative Process, (3) *training* refers to the Press, and (4) *innovation, improvement, value, creation, and progress* refer to the Product. The present results could be interpreted as showing that Person and Products might be the two most represented strands in participants' implicit conceptions. In conclusion, the analysis of implicit theories of creativity and innovation reflect, at least to some extent, the main scientific conceptions related to those concepts.

The dimensions of implicit theories of creativity and innovation are composed slightly differently, which is informative about the conceptualization of both concepts and their relation. A qualitative analysis of the dimensions of implicit theories of managerial creativity reveals a correspondence with the different steps of creative and innovative processes. Indeed, for the first dimension, items such as *moving outside the framework, interaction, transversality, sharing, curiosity, questioning* seem to reflect the objective of trying to do things differently in organizations which may correspond to the steps of Problem Recognition, Idea generation and Idea selection. For the second dimension, items such as *organization, accompaniment, anticipation, training, goal* could correspond to leadership skills that are necessary for Idea promotion and Idea implementation. Finally, the third dimension is composed mainly of terms that were generated as characteristics of Innovation in the preliminary phase. Words composing

the dimension, such as *idea, progress, innovation*, reflect the creative production itself and its possible consequences.

The qualitative analysis of the dimensions of implicit theories of managerial innovation reveals a slightly different structure. The first dimension encompasses clearly creativity, the Idea Generation step and creative products. The second dimension seems to be composed of leadership skills that can be perceived as the objectives of managerial creativity (e.g., *Listening, Accompaniment, Interaction*). Finally, the third dimension reflects skills that are necessary in order to implement innovative practices (e.g., *motivation, adaptability, courage, anticipation*).

Finally, results obtained with the basic cognitive schemes methodology allowed an investigation of the kind of relation managers perceive between creativity and innovation for managerial activities. It seems that although creativity is strongly linked with innovation, it is, however, not completely interdependent and could have other objectives and consequences. In contrast, innovation seems to require creativity in order to emerge. Such conceptualizations corroborate most explicit theories for which creativity can have numerous objectives (e.g., to improve work teams, to solve conflicts) but is also the first step of the innovation process (e.g., Amabile, 1988; de Jong & den Hartog, 2010; West, 2002). Finally, innovation appears to be conceived as a tool that could help to develop creativity. This conceptualization echoes approaches conceiving that each step of the process, including the implementation step, implies creative thinking (Basadur et al., 1982; Paulus, 2002). In this perspective, innovation and more specifically managerial innovations may result in new and adapted practices that (1) aim to facilitate the expression of others' creativity or (2) will require creativity to diffuse and adapt them.

In conclusion, results from the first study show that implicit conceptions of creativity and innovation related to managerial activities correspond, to a large extent, to explicit theories. Prototypical attributes encompass different approaches of creativity with a notable proportion related to leadership skills and an underestimation of the role of the environment. As stated before, implicit theories of creativity are primarily studied regarding the creative individual. Thus, the present results reflect the salience of the person as the principal object of application of creativity. The second study aims to refine our understanding of implicit theories that are specific to a creative manager.

## Study 2. Implicit Theories of a Creative Manager

Study 1 allowed us to identify the correspondence between explicit and implicit theories of managerial creativity on several aspects. Both of them refer to different objects of application for managerial creativity (process, person, press and product) but they express a link between creativity and innovation. However, because previous research evoked a potential negative relationship between creativity and effective leadership (e.g., Mueller et al., 2011), study 2 focuses on the identification of the characteristics that are implicitly attributed to creative managers. Indeed, if a majority of CEOs declared that creativity should be explicitly related to management (IBM Institute for Business Value, 2010), previous researches contradicts this assertion (Mainemelis et al., 2015; Mueller et al., 2011). For example, perceived creativity negatively predicts the detection of leadership potential (Mueller et al., 2011), and implicit theories of leadership do not encompass creativity as prototypical traits of a leader (e.g., Epitropaki & Martin, 2004). Thus, investigation implicit theories of a creative manager may help to understand the gap between CEOs' assertions and managers' perception on creativity. In this way, we might be able to determine the extent to which implicit theories of a creative manager entail negative or unfavorable characteristics for a manager. Thus, study 2 seeks to complement Study 1 by focusing on the characteristics of the creative person and by using a methodology that allow respondents to select easily favorable and unfavorable characteristics of a creative manager.

Furthermore, we hypothesize that implicit theories of a creative manager will reflect the variability of scientific conceptions in the sense that they will be structured along multiple dimensions. Therefore, this second study aimed, to explore the structure of implicit theories of a creative manager. Few studies have attempted to do so and the most notable exceptions are studies of Sternberg (1985) and Offermann, Kennedy, and Wirtz (1994) on respectively the implicit theories of creativity and leadership. Sternberg (1985) approached implicit theories of intelligence, creativity and wisdom by using factor analyses to group prototypical attributes into factors that were most representative of collectively held implicit conceptions. Professors gave prototypical behaviors of creative people in their respective domain. Sternberg found that the attributes of creative people could be summarized in four bipolar dimensions

(Nonentrenchment, Integration and intellectuality, Aesthetic taste and imagination, and Decisional skill and flexibility).

Similarly and on another topic, Offermann et al. (1994) investigated the structure and generalizability of implicit leadership theories shared in organizations. They asked undergraduate students to list 25 traits of a leader or a supervisor. A total of 160 characteristics were retained and were presented to a second sample of students who rated the extent to which each of the items were characteristic of a leader, an effective leader or a supervisor. Then, using principal components analyses; they identified eight dimensions of prototypical and antiprototypical traits that remained relatively stable across the stimuli (leader, effective leader and supervisor).

In the present study, prototypical traits of a creative manager were first selected among the 300 adjectives that composed the Adjective Check List (ACL; Gough, 1960; Gough & Heilbrun, 1965). As stated by Gough (1960), one interest of the ACL is the diversity of use that can be made of it. Most research used the ACL to obtain self-reported or external ratings of personality. Notably, the ACL has been used to identify the personality characteristics of a creative person (e.g., Domino, 1970; Gough, 1979; Smith & Schaefer, 1969), and the utility of the ACL for assessing characteristics of a creative person has been empirically tested (Domino, 1994). However, Gough (1960) proposed a broader range of application of the ACL, in which he mentioned the possibility for external judges to use the ACL to describe one or more individuals. In this specific case, the ACL is not used for personality assessment but to collect subjective evaluations, conceptions or judgments of individuals with some specific characteristics. In this vein, Katz and Giacomelli (1982) used the ACL to understand the subjective criteria that people use when identifying creative individuals. The authors selected 40 adjectives from the ACL and confronted participants either to a neutral or a creativity-salient experimental condition. Each participant was asked to sort the adjectives into as many categories as they wanted, as long as they perceived that attributes in one category were similar. Results lead to the conclusion that individuals might judge people as creative based on their actions, or self-presentation rather than their actual productions.

Runco, Johnson and Baer (1993) used the ACL to capture teachers and parents' implicit characteristics of creative (and non-creative children). As explained by the authors, the ACL was chosen for it presents favorable and unfavorable attributes and because it allowed comparing teachers and parents implicit conceptions of creative children. In this study, parents and teachers were given the ACL and asked to select adjectives they consider indicative of a

creative child. The authors noticed the similarities and differences between parents and teachers' implicit theories of creative children; and, from their results, they created an assessment tool: the Parental Evaluation of Children's Creativity.

In the present study, we follow a similar objective. The ACL will be used in order to identify managers' implicit theories of the characteristics of a creative manager. The ACL has been selected because it contains adjectives describing different aspects of a person. Thus, it can be used to characterize specific individuals, such as a creative manager, and it give respondents the possibility to choose favorable and less favorable descriptors of a creative manager. Then, taking the logic of the approach followed by Cattell (1957) on his search for the dimensions of human personality, and inspired by the research from Sternberg (1985) and Offerman, Kennedy, and Wirtz (1994), we wish to investigate the structure of prototypical traits of a creative manager by conducting a principal components analysis. Because creativity and leadership are not univocally related (e.g., Lord et al., 1984; Mueller et al., 2011) and implicit leadership theories are structured across multiple dimensions, we expect results in favor of a multidimensional structure of implicit theories of creative managers. Moreover, because research in ILT suggests correlated factor models (Epitropaki & Martin, 2004; Offermann et al., 1994), we assume that dimensions composing the implicit theories of managerial creativity will be correlated. We tested also the effects of the potential dimensions characterizing a creative manager on the extent to which they were perceived as adopting creative behaviors. As Mueller, Goncalo, and Kamdar (2011) raised the possibility that creativity and leadership may entail antagonistic conceptions; we might find that implicit theories of a creative manager are partitioned into conceptions about a creative person and conceptions about a leader. In contrast, we may encounter attributes that seem unsuited to a creative person (e.g., conform) but may be prototypical of a manager.

## **Pre-study: Collecting attributes of a creative manager**

Participants were French managers from different French companies. They were contacted by mail and on internal and external business-related social media and invited to participate to a study on creativity and management. Two hundred and twenty-three managers accepted to participate in the research and completed the survey ( $M_{age} = 43.94$ ;  $SD_{age} = 10.02$ ; 29.6% were women, mean years of managerial experience = 11.65;  $SD_{exp} = 8.55$ , mean number of

collaborators under supervision = 28.37;  $SD_{coll} = 79.05$ ). They were asked to indicate among three hundred adjectives those characterizing a “creative manager” and were presented the validated French version of the *Adjective Check List* (ACL, Gough, 1960; Gough & Heilbrun, 1965).

Amabile (1982) assumed that experts in a domain are the best judges to evaluate creativity. The necessity to rely only on experts has been tested previously and seems to be domain specific (Kaufman, Baer, Cropley, Reiter-Palmon, & Sinnett, 2013). Because the question has not yet been addressed regarding managerial creativity, we sought to differentiate adjectives selected by managers who had considerable experience and adjectives selected by less-experienced managers. We considered as experts those whose personal characteristics were simultaneously above the median value of the total group of participants for three demographic variables: the number of years of managerial experience, the number of occupied positions as a manager, and the number of supervised collaborators during their career. Following this criterion, sixty-nine managers were considered as “experts”, among them, 82% were male. Taking the criterion that adjectives could be seen as prototypical if they were given by at least 50% of the experts, we compared the adjectives chosen by experts and non-experts. Results led us to rely on experts because they selected a greater number of attributes (35 adjectives for the experts and 26 for the non experts). The only words that were selected by 50% of non-experts and not by 50% of experts were *grateful* and *persistent*. They were not included in our list of selected adjectives. The thirty-five adjectives were placed in a questionnaire and each was associated with a 7-point rating scale. The items are presented in Table 6.

## **Main study: Investigating the structure of implicit theories of a creative manager**

### **Participants**

Invitations were sent to managers for participating to an online survey, created on Limesurvey<sup>®</sup>. They were posted on professional and business-related social media networking sites and sent to available professional email addresses. These messages stipulated that the survey concerned only managers who were speaking French and addresses their perception of creativity (or innovation) in managerial activities. No other criteria were applied to select participants.

Participants were French managers from different French organizations. Among the 177 managers who accessed the survey, 104 completed it (59%). Participants exercised in more than 15 sectors, primarily in health, corporate services and financial sectors. Sixty-five percent were male. Their mean age was 39.52 years old ( $SD = 10.87$ ) and their mean number of years of managerial experience was 16.79 ( $SD = 10.73$ ).

## Material and procedure

First, participants were given instructions to think of the most creative manager (female or male) they met during their professional career, and to keep this person in mind throughout the whole questionnaire. Then, they were asked to complete an online questionnaire, composed of two parts, to assess several characteristics of this creative manager.

### Creative manager questionnaire

The first part of the questionnaire was composed of thirty-five attributes selected during the first part of the study. Participants were asked to rate the extent to which each attribute described the most creative manager they had in mind. A seven-point Likert scale (from 1 = “Not at all” to 7 = “To a great extent”) was used to collect ratings.

### Creative behaviors questionnaire

In the second part of the questionnaire, participants were asked to assess the creative performance of the creative manager they had in mind using a scale developed by George and Zhou (2001). This scale is composed of 13 items describing creative behaviors in the workplace. Participants had to rate how each behavior described in the scale was characteristic of the most creative manager they had in mind. Their ratings were collected using a 7-point Likert scale (from 1 = “Not at all characteristic” to 7 = “Very characteristic”). A principal component analysis was conducted to investigate the dimensionality of this scale ( $KMO = .93$ ; Bartlett’s test of sphericity:  $\chi^2(12) = 43.05$ ,  $p < .001$ ). A parallel analysis indicated that the items of the scale composed a unique dimension. The internal consistency was satisfactory in the present research ( $\alpha = .90$ ).



## Results

### Implicit theories of a creative manager: identification of the main dimensions

The factorability of the 35 attributes was examined using several criteria. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy coefficient was good (.80), and Bartlett's Test of Sphericity was significant ( $\chi^2(630) = 2153.22, p < .001$ ), indicating that the correlation matrix was not random. The Measure of Sampling Adequacy (MSA) for each variable varied between .46 and .88 ( $Mdn = .80$ ), supporting the inclusion of each item in the factor analysis. All these indicators allowed conducting a factor analysis for all the attributes.

We conducted a principal component analysis to investigate the structure of the relationships between the attributes that were used to evaluate the most creative manager. From the initial solution, a parallel analysis (Horn, 1965) with 1000 replications indicated that only the first three factors should be extracted. For this three-component solution, accounting for 46% of the variance, six attributes had communalities inferior to .30: *sociable* (.24), *assertive* (.23), *imaginative* (.22), *ingenious* (.28) and *clever* (.25). However, removing these six items led to a very similar factor structure, and slightly different factor loadings. Therefore, conserving all the initial items, the three factors were extracted and rotated (promax) to explore the multidimensional structure of the attributes of implicit conceptions of a creative manager. The factor loadings for this final solution are presented in Table 6.

For the first component, the attributes with the highest loadings ( $|l| > .60$ ) were, in decreasing order of value: *daring*, *energetic*, *enterprising*, *initiative*, *adventurous* and *ambitious*. This component could be interpreted as a creativity dimension. For the second component, the attributes with the highest loadings were: *adaptable*, *trusting*, *cooperative*, *natural*, *wholesome*, *optimistic*, *enthusiastic*, *sincere* and *understanding*. These characteristics seem related to transformational or authentic leadership. For the third component, the attributes with the highest loadings were: *intelligent*, *reliable* and *responsible*. These characteristics echo a form of intelligent and responsible leadership. The correlations between the three components, that we can designate respectively as the Creative, the Transformational and the Responsible dimensions of the implicit theories of a creative manager, are presented in the last lines of Table 6. The components "Transformational" and "Responsible" show the strongest correlation ( $r = .45$ ).

Table 6. Factor loadings and communalities based on a principle components analysis with promax rotation for 35 attributes selected from the Adjective Check List (ACL) (N = 104)

	Comp.1	Comp.2	Comp.3	Communality
Daring	.76			.61
Energetic	.74			.61
Enterprising	.71			.58
Initiative	.68			.49
Adventurous	.65			.43
Ambitious	.63			.38
Inventive	.51		.31	.43
Ingenious	.46			.28
Imaginative	.45			.22
Demanding	.43	-.33	.34	.34
Assertive	.42			.23
Interests wide	.41		.34	.40
Adaptable		.72		.53
Trusting		.66		.52
Cooperative		.66		.51
Natural		.65		.54
Wholesome		.65		.46
Optimistic		.65		.45
Enthusiastic	.40	.63	-.31	.50
Sincere		.62	.38	.70
Understanding		.62		.59
Poised		.56		.32
Sociable		.54		.24
Intelligent			.71	.46
Reliable		.44	.63	.79
Responsible			.62	.50
Courageous	.30		.56	.53
Insightful			.55	.39
Honest		.44	.55	.65
Curious			.54	.37
Active	0.35		.53	.46
Informal	0.42		-.49	.31
Alerte	0.42		.46	.47
Persevering	0.34		.38	.46
Clever			.32	.25
Correlations between components				
	1	1		
	2	.19	1	
	3	.27	.45	1

*Legend.* Comp.1 = first component, Comp.2 = second component, Comp.3 = third component.

*Notes.* For all components, attributes are presented in order of their highest loadings and loadings <.30 have been suppressed.

## Effects of the creative manager's characteristics on their creative behaviors

Next, the effect of the three dimensions characterizing the creative manager on the extent to which managers were perceived as adopting creative behaviors was tested. Three scores were created respectively from the three dimensions. We calculated them by adding the scores obtained by participants in each item that had their primary loadings on each component and that did not have secondary loadings superior to .30 on any another component. For the three scores, the internal consistency was good (Creativity: 9 items;  $\alpha = .82$  and  $r_{\text{moy.}} = .36$ ; Transformational: 9 items;  $\alpha = .84$  and  $r_{\text{moy.}} = .37$ ; Responsible: 5 items;  $\alpha = .71$  and  $r_{\text{moy.}} = .33$ ) and the results indicate that it is unnecessary to remove any items to improve it. A multiple regression analysis was conducted to evaluate how the three scores that characterize the creative manager predict the assessment of the same manager's behaviors as they have been rated by participants on the Creative Behavior Scale (George & Zhou, 2001). The results show that behavior ratings were significantly predicted by the three scores, but much more by the third one which concerns characteristics of a Responsible manager (Creativity:  $b = .20$ ,  $t(100) = 2.46$ ,  $p < .016$ ; Transformational:  $b = .27$ ,  $t(100) = 3.35$ ,  $p < .002$ , Responsible:  $b = .41$ ,  $t(100) = 4.78$ ,  $p < .001$ ). The full model accounted for a significant part of variance;  $F(3,100) = 29.16$ ,  $p < .001$ ,  $R^2_{\text{adjusted}} = .45$ . These results are a first demonstration of the influence of implicit theories on creative behaviors. Such assumption will be tested again thereafter, but this time, by investigating the effects of managers' implicit theories on their own creative behaviors.

## Discussion

When compared to the English and Italian version, the French validated version of the ACL (Gough, 1960; Gough & Heilbrun, 1965) showed significant differences regarding the desirability of items across the nationality of judges or the language of the scale. Subsequently, because we conducted our research in France, results from the present study should not be generalized directly to different cultures and languages.

Some attributes selected by experienced managers in the pre-study correspond to those selected from the ACL<sup>8</sup> to characterize a creative person in general. However, several adjectives that

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<sup>8</sup> The first scale, published by Smith and Schaefer (1969) was composed of 27 adjectives characterizing a creative person selected from creative high school students' self-reports. The second one was developed by Domino (1970) and consists of 59 adjectives collected among faculty members assessing characteristics of identified creative students. The third scale is the Creative Personality Scale developed by Gough (1979). It is composed of 18

composed previously constructed scales assessing a creative person in previous research have not been selected. For example, *complicated* and *cynical* (Smith & Schaefer, 1969), *autocratic* and *intolerant* (Domino, 1970), or *snobbish* and *egotistical* (Gough, 1979) have not been recognized as characteristic of a creative manager. These differences might be due to cultural and linguistic effects, but may also be due the specificity of creativity related to managers.

Thus, it seems that when creativity is associated with the representation of a manager, implicit theories become less pejorative, more adapted to the role and the expectations toward managers' skills and behaviors. Yet, scientific theories highlighted that this unsociable and assertive facet composed the characteristic traits of a highly creative person (e.g., Chavez-Eakle, Lara, & Cruz-Fuentes, 2006; Feist, 1999; Kaufman & Sternberg, 2010). These results raise the possibility that, if managers' implicit theories do not take into account such inherent aspects of a creative person, unsociable but highly creative managers would not be recognized per se. This possibility could explain why creative managers were not recognized for their leadership potential in the research conducted by Mueller, Goncalo and Kamdar (2011).

Investigating the structure of the attributes characterizing a creative manager reveals a tri-dimensional structure for implicit conceptions of a creative manager. The first dimension corresponds to creativity (e.g. *daring*, *energetic*, *enterprising*). The second dimension reflects some positive characteristics related to authentic or transformational leadership (e.g. *adaptable*, *trusting*, *cooperative*). Certain characteristics composing the second dimension correspond to the dimensions Charisma and Sensitivity in implicit leadership theories proposed by Offerman, Kennedy and Wirtz (1994). Finally, with regard to previous studies on implicit theories of a creative person and implicit leadership theories, the third dimension seems to be composed of attributes that are more prototypical of a manager than of a creative person. The third dimension encompasses characteristics that echo a form of intelligent and responsible leadership (e.g. *intelligent*, *clever*, *reliable*, *responsible*). Responsible leadership represents a kind of leadership that emphasizes accountability, reliability and decision-making expressed by supervisors (Pless & Maak, 2011). Surprisingly, most research on leadership and innovation highlight the importance for managers to delegate responsibilities rather than personify it in order to increase organizational creativity (Basadur, 2004; Ortt & Duin, 2008). Even more surprisingly, this third dimension was found to be the best predictor of managers' creative behaviors. A possible interpretation is that managers who act more creatively are perceived as

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adjectives characterizing a creative person and 12 characterizing a non-creative person. For this last scale, the adjectives have been selected from collected self-reports of 1631 participants from diverse professional backgrounds (e.g. architects, mathematicians, graduate students).

proactive, responsible for improving their work and intelligent because they succeeded. Thus, when thinking of a creative manager, participants could have mostly considered managers who already implemented successful improvements in their practices, and who were identified as accountable for managerial creativity and innovation. A second possible interpretation is that managers hold contradictory beliefs. They perceive that creative managers can be both creative and reliable at the same time. As highlighted by Furnham, “Lay theories are frequently ambiguous, incoherent, and inconsistent. That is, people can hold two mutually incompatible or contradictory ideas or beliefs at the same time and not be particularly troubled by that inconsistency.” (1988, p. 3). However, if leaders apply such implicit theories as criteria to identify creative managers, it is akin to finding the proverbial needle in the haystack.

We decided not to include adjectives identified in previous research as characteristics of an effective leader or a creative individual because these adjectives were selected with different methodology investigating different kinds of implicit theories, in different countries and at a different time. However, including adjectives from previous and present research to study the dimensionality of implicit theories of managerial creativity could enrich the present results. Moreover, several adjectives were given by non-experts managers and not by experts managers. Notably, the adjectives *grateful* and *persistent* were given by more than 50% of non-experts and less than 50% of experts, and were not selected after the pre-study because of the criteria we applied. However, such differences between experts and non-experts’ implicit theories of a creative manager should be further investigated as it could entail numerous practical implications in terms of adequacy between executives and managers’ expected managerial behaviors.

The third study will investigate the extent to which implicit theories of creativity in managerial activities differ among managers and how such difference can be related to dissimilar evaluations of a creative manager, creative managerial productions or engagement in creative behaviors.

## Study 3. Effects of implicit theories of creativity

Conceptions of creativity result from the individuals' environment, their knowledge, formal and informal discussions (Villalba, 2009). Consequently, these conceptions can vary between individuals (Glăveanu & Tanggaard, 2014; Runco, 1989; Runco & Charles, 1993; Runco & Johnson, 2002; Runco et al., 1993). The first objective of the present study will be to test whether there is a disagreement among leaders' implicit theories of managerial creativity.

Hypothesis 1. Leaders have dissimilar implicit theories of managerial creativity.

Moreover, implicit theories of creativity are evoked each time an individual is confronted with a related subject. For example, individuals' evaluations of creative ideas, productions and behaviors are assumed to be built on their implicit theories of creativity (Caroff & Besançon, 2008; Hood, 1973; Katz & Giacomelli, 1982; Runco & Charles, 1993; Runco & Johnson, 2002; Silvia, 2008; Szen-Ziemiańska, 2013). Previous studies demonstrated that the evaluation of creativity differs as a function of judges' personality (Silvia, 2008; Storme & Lubart, 2012), intelligence (Storme & Lubart, 2012), creative abilities (Caroff & Besançon, 2008; Hood, 1973; Silvia, 2008) or expertise (Amabile, 1996; Amabile, 1982; Hennessey & Amabile, 2011; Kaufman et al., 2009). Thus, the level of creativity that is attributed to productions or individuals in real-life settings is not an invariant feature but is almost always based on the subjective judgments of raters and partially depends on their characteristics. As stated by Csikszentmihalyi (2006), creativity is not achieved individually but needs social validation. When a leader is rewarded for his practice that has been perceived as new, adapted and a source of substantial improvement, it is thus the result of a fit between the practice itself and judges' conceptions of what constitutes a creative practice. Consequently, we postulate that:

Hypothesis 2: Leaders with dissimilar implicit theories have different perceptions of a) their own behaviors, b) the characteristics of a creative manager and c) the creativity levels of managerial productions.

Moreover, we stated that creativity ratings are the result of the encounter between an idea, a product or an individual and judges that recognize in this object the feature of what they consider creative. Thus, we wish to investigate how judges react to different productions. Indeed, the level of originality and adaptation of the productions influences judges' evaluations of the overall level of creativity (Paletz & Peng, 2008). More precisely, creativity ratings

depend mostly on the perceived novelty, and to a lesser extent on the perceived appropriateness (Benedek et al., 2016; Caroff & Besançon, 2008; Diedrich, Benedek, Jauk, & Neubauer, 2015; Runco & Charles, 1993). Besides the independent effects of originality and adaptation, the interaction between the features influenced also judges' ratings (Diedrich et al., 2015). Moreover, Hood (1973) demonstrated that the perceived level of originality of a product depended on individual characteristics such as creative abilities. By stepping aside from previous findings, we seek to investigate how different implicit conceptions influence how leaders will take into account the levels of originality and adaptation, as well as their interactions in their evaluations of creativity. Consequently we postulate:

Hypothesis 3: Leaders who do not share the same implicit conceptions take differently into account the aspects of originality and adaptation when rating the level of creativity of managerial productions.

## **Pre-study: Collecting creative managerial practices**

In order to study the effect of implicit theories on the evaluation of managerial productions, it was necessary to include in our material examples of creative managerial practices. In addition, we wanted to control the level of originality and adaptation of these practices in order to ensure sufficient variability in the evaluation of creativity of these practices and to study how these two criteria are taken into account by judges in their ratings.

In a study conducted in 2014, two Master students of Industrial/ Organizational Psychology carried out a research project in which they collected practices that managers had implemented and considered creative. To collect these practices, students relied on the Critical Incidents Technique (Flanagan, 1954) and asked managers during interviews to retrieve and describe situations where they expressed their creativity in their job. In this way, 100 managerial practices that are more or less creative, and the context in which they were created and implemented, are documented (see an example of practice in the box below). Of the 100 managerial practices collected, 16 were not selected for the next evaluation stage because they lack clarity or information.

*Box 1.* Example of creative managerial practice collected.

Context: Need to motivate the team and improve performance.

Solution: Mutualization of objectives, the results then become common. Before, the employees had each a goal to achieve. Now, it's a group objective.

Two on-line questionnaires were then created, consisting of 84 creative managerial practices and demographical questions (age, gender, professional and managerial experience, sector of activity). The two questionnaires were composed of the same questions, instructions and managerial practices but the practices were presented in different order of presentations.

We recruited 27 managers with notable experience and from different organizations and sectors (4 women, 23 men, average age: 54 years, years of professional experience:  $M = 30.85$ ,  $min = 16$ ,  $max = 47$ , years of managerial experience:  $M = 20.93$ ,  $min = 6$ ,  $max = 40$ ). They were asked to rate the 84 practices, using 7-point Likert scales to indicate to what extent each practice was (1) original and (2) adapted (in the given context). For each managerial practice, we were able to calculate two scores: an average score representing the level of originality and an average score representing the level of adaptation. From these two scores, we selected only 5 practices that differed notably in terms of originality and/or adaptation. One practice is poorly original and poorly adapted (O1A1), one practice is poorly original and very adapted (O1A3), one practice is moderately original and moderately adapted (O2A2), one practice is very original and poorly adapted (O3A1) and the fifth practice is very original and very adapted (O3A3). These five practices were retained for the main study in order to collect participants' evaluations of creative productions. They are presented in Appendix 3.5.

## Main study

### Participants

We created an online questionnaire on Limesurvey<sup>®</sup> aiming to assess the different variables and collect sociodemographic data. We contacted French managers between February and May 2016 on intern and extern social networks, and invited them to click on a link to complete the questionnaire. The message accompanying the link stipulated the anonymity of the respondents and the confidentiality of their answers. Four hundred and eighty four managers started the



questionnaire, and 244 completed it (50.4% of completion). Respondents were working in different companies from diverse sectors (in decreasing order of frequency: Industry ( $N = 38$ ), consulting ( $N = 35$ ), banking and financial ( $N = 31$ ), distribution ( $N = 26$ ), etc.). Demographic characteristics for the sample of 244 managers are presented in Table 7.

*Table 7.* Descriptive statistics [Mean  $\pm$  SD or  $N(\%)$ ] for the final sample

Variable	Participants ( $N = 244$ )
Sex (Male)	173 (70.9)
Age (years)	38.1 $\pm$ 8.1
Less than 25	2 (0.1)
25-35	59 (24.2)
36-45	87 (35.7)
46-55	64 (26.2)
More than 55	32 (13.1)
Professional experience (years)	
Less than 5	16 (6.6)
5-10	30 (12.3)
11-15	42 (17.2)
16-20	45 (18.4)
21-25	46 (18.8)
26-30	31 (12.7)
More than 30	34 (13.9)
Managerial experience (years)	
Less than 5	56 (23)
5-10	52 (21.3)
11-15	60 (24.6)
16-20	30 (12.3)
21-25	23 (9.4)
26-30	13 (5.3)
More than 30	10 (4.1)
Actual number of collaborators	41 $\pm$ 212
Total number of collaborators	112 $\pm$ 468
Position	
Line manager	68 (27.9)
Project manager	55 (22.5)
Senior manager	69 (28.3)
Other (e.g. CEO, Entrepreneur with a team)	52 (21.3)

## Material

Twelve biographical and demographic questions were asked in the questionnaire in order to collect participants' age, gender, educational level, years of professional experience as a manager, managerial position, number of collaborators supervised currently and in the past, and the sector of activity.

### Implicit theories of managerial creativity

To assess the implicit theories of each participant, we used the method of the independence test developed by Lo Monaco, Lheureux, and Halimi-Falkowicz (2008). We constructed a questionnaire with the 24 words or expressions collected in the first study of the present document. For each word or expression, we asked participants: "In your opinion, is managerial creativity always characterized by...?", followed by the 24 words. Participants were required to respond on a 7-point Likert scale ranging from 1 - Not at all to 7 - Completely. Before conducting analyses involving this scale, the data were centered per individual to avoid that the scale reflects a more or less favorable attitude towards managerial creativity.

### Leaders' innovative behaviors

We translated the scale of creative performance composed of 13 items developed by George and Zhou (2001). For each item (presented in Appendix 3.3.), the managers were instructed to indicate on a 7-point Likert scale (1 - No, not at all to 7 - Yes, quite) how they described them as a manager. George and Zhou (2001, 2002) postulated that this scale assesses a unidimensional construct; but for the present study the results of a confirmatory factor analysis contradicted this assumption ( $\chi^2 = 395.09$ ,  $df = 65$ ,  $p < .001$ , CFI = .73; NNFI = .67; RMSEA = .14; SRMR = .09). We have therefore carried out a principal component analysis (PCA) (KMO = .84, Bartlett's sphericity test:  $\chi^2(78) = 1251.92$ ,  $p < .001$ ). MSAs for items vary between .76 and .90, which allows the inclusion of all of them in the factor analysis. Parallel analysis (Horn, 1965) with 1000 iterations indicates that the first three factors could be extracted. They account for 61% of the total variance. For the three-component solution, no item has a community inferior to .30. The three factors were therefore extracted and rotated (varimax). The matrix of saturation coefficients is presented in Appendix 3.3. The first dimension refers to creative behaviors in general or behaviors that are oriented towards the creation of new products. We call it the "Creativity" dimension ( $\alpha = .83$ ). The second dimension includes items that evoke the creation of new practices and working methods. We

refer to it as "Managerial creativity" ( $\alpha = .80$ ). Finally, the third dimension includes items expressing risk-taking, promotion and implementation behaviors. This category is referred to as "Management of creativity" ( $\alpha = .60$ ).

### Characteristics of a creative manager

The rating scale used to assess the conception of a creative manager is composed with the 35 adjectives collected in Study 2. We consider that managers who have different implicit theories related to managerial creativity will emphasize different characteristics of a creative manager. Thus, even though the 35 adjectives reflect primarily leaders' implicit theories of a creative manager, we postulate here that the characteristics of a creative manager emphasized by the respondents may be influenced by their implicit theories of managerial creativity. We asked the respondents to think of the most creative manager with whom they have ever worked. The participants had then to rate to what extent the 35 adjectives characterized the manager they had evoked. We asked also the participants to indicate the sex of the creative manager and their hierarchical relation with him or her. We therefore carried out a principal component analysis ( $KMO = .90$ , Bartlett's sphericity test:  $\chi^2(630) = 4989.88$ ,  $p < .001$ ). MSAs for items vary between .72 and .94, which allows the inclusion of all items in the factor analysis. Parallel analysis (Horn, 1965) with 1000 iterations indicates that the first five factors must be extracted, accounting for 56.9% of the total variance. For the five-component solution, only the item "non-conformist" has a communality inferior to .30 (.28) but its deletion does not modify the factorial structure. By retaining the 35 items, we extracted the five factors and used a promax rotation. The matrix showing the saturation coefficients is presented in Appendix 3.4. The dimensions are named according to the item that shows the greatest saturation on each: "Active" ( $\alpha = .85$ ), "Understanding" ( $\alpha = .79$ ), "Responsible" ( $\alpha = .79$ ), "Sincere" ( $\alpha = .88$ ), and "Inventive" ( $\alpha = .60$ ).

### Evaluation of creative productions

The five managerial practices selected from the pre-study were presented to participants. These last were asked to rate the extent to which each of the five practices was creative on a 7-point Likert scale from 1 - Not creative at all to 7 – Extremely creative. The five practices are presented in Appendix 3.5.

## Results

Data were screened for assumptions of linearity, normality, homogeneity and multicollinearity (Tabachnick & Fidell, 2001). No respondents were identified through Mahalanobis distance as multivariate outlier ( $\chi^2(47) = 82.72$ ,  $p < .001$ ). The sample used for the final analyses is composed of 244 managers. Appendix 3.6. shows overall means and standard deviations for each variable of the model and presents the correlations among the different measures.

### Common method variance

Podsakoff et al., (2003) highlighted that one of the main sources of potential bias involved individuals' implicit theories. Nevertheless, it is not of our interest to try to control this source of bias because we seek precisely to investigate the effects of different implicit theories on evaluation of creativity-related constructs. However, the present data were collected at one time for each participant and through the same online questionnaire. This procedure could lead to numerous potential sources of common method biases (e.g., same rater effects, item characteristics effects, item context effects, measurement context effects) as suggested by Podsakoff, et al. (2003).

To control the extent to which common method variance constitutes a threat to the results analysis for the present data, we conducted first a Harman one-factor test on every item ( $N = 95$ ). This factor accounted for 15.5% of the variance, which is not weak but insufficient to explain the majority of the covariance between the variables (Podsakoff & Organ, 1986). However, Podsakoff et al., (2003) advised conducting further control for common method bias. Consequently, we conducted also a CFA loading every item on one single factor. Indices of fit demonstrate that this solution does not fit the data ( $\chi^2 = 12030.47$ ,  $df = 4370$ ,  $p < .05$ ; CFI = .30; NNFI = .29; RMSEA = .09; SRMR = .11). We conclude therefore that the following findings are less likely to be attributed to method variance.

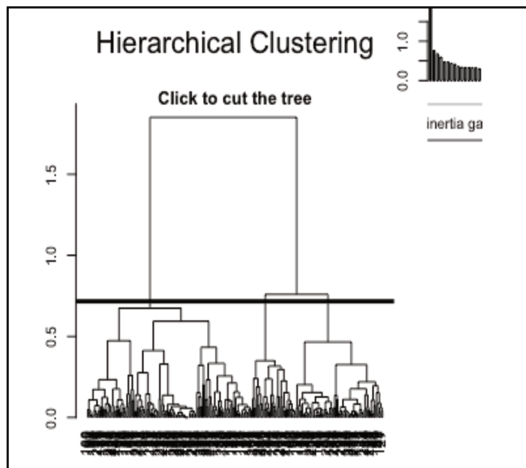
### Partitioning Method

We conducted a Hierarchical Clustering on Principal Components (HCPC, Husson, Lê, & Pagès, 2011) in order to identify different patterns of implicit theories of managerial creativity, and to categorize participants according to the degree of similarity and dissimilarity of their conceptions. It is postulated that participants who share similar implicit conceptions of managerial creativity present similar patterns of ratings for the 24 words or expression

characterizing managerial creativity. To put it another way, because HCPC enables a classification of participants based on the proximity between their profiles of ratings, we postulate that in each cluster participants share similar conceptions of managerial creativity, whereas participants from different clusters have dissimilar conceptions. Analyses were conducted using the FactoMineR 1.33 package (Husson, Josse, Le, Mazet, & Husson, 2016) on R 3.3.1 (R Development Core Team, 2016). Multivariate analyses were performed on the ratings of the 24 items of implicit theories of managerial creativity. Supplementary variables were added in order to be projected in the clustering: age, managerial experience, innovative behaviors scores (3 scores), characteristics of a creative manager (5 scores), evaluations of the five managerial practices, and the average of these evaluations (*Mean Prod*), age and sex. Supplementary variables are not used to calculate the distances between individuals' profiles but they will be objects of comparison between the clusters, which will enable us to answer several of our hypotheses.

HCPC adopts the principle of hierarchical ascending classification (Ward, 1963). It is based on the coordinates of individuals in the principal component analysis. A principal component analysis is first performed on the ratings for the 24 words or expression characterizing managerial creativity. The main goal of this analysis is to define and calculate the distances between participants' profile of ratings. To do this, we need to keep as many components as possible, deleting only the last one, which is considered as noise because it almost does not increase the explained variance. From the remaining 23 components, we calculated the distances between participants from their coordinates in each component. These distances are then used to construct the hierarchical tree. On this hierarchical tree, the function of the FactoMineR package proposes a cut-off level corresponding to the application of the elbow criterion on the inertia gain. By selecting this cut-off level (see Figure 2), the partition of individuals is organized into three classes.

Figure 2. Hierarchical tree



This partition is consolidated using a method that applies the K-means algorithm and uses the Euclidean distance between individuals. Appendix 3.7. presents, in ascending order, the items that characterize significantly the class partition and their  $\eta^2$ . The 244 participants are grouped into 3 classes in which they share similar implicit conceptions. The existence of 3 classes demonstrates that leaders in the current sample do not share a unique conception of creativity but have more or less similar implicit conceptions, which supports hypothesis 1.

### Partition interpretation

To investigate which implicit theories are shared within the three clusters, we can look at the cluster description table (see Table 8). This table presents the items assessing implicit theories of creativity that differed significantly between the members of a cluster and the members of the other two clusters. Supplementary variables are also presented in the table in *italic* when the scores differ significantly between the members of a cluster and the members of the other two clusters.

Table 8. Clusters description

Component	V test	Cluster mean	General mean	Cluster SD	General SD	p value
<b>Cluster 1</b>						
Innovation	7.28	0.77	0.04	0.88	1.12	***
Moving outside the framework	7.16	0.68	-0.24	0.91	1.45	***
Imagination	6.50	0.84	0.12	0.79	1.25	***
Novelty	5.72	0.28	-0.34	1.12	1.23	***

Component	V test	Cluster mean	General mean	Cluster SD	General SD	p value
Change	3.90	0.00	-0.38	1.01	1.11	***
Idea	3.54	0.55	0.26	0.86	0.92	***
Curiosity	3.25	0.83	0.53	0.74	1.01	**
Vision	2.81	0.35	0.06	1.08	1.17	**
<i>Dim Inventive</i>	2.68	0.24	0.00	0.89	1.00	**
<i>Management of creativity</i>	-2.23	5.42	5.60	1.07	0.94	*
Dynamism	-2.41	-0.25	-0.02	1.00	1.06	*
<i>OIAI</i>	-3.16	4.08	4.53	1.51	1.61	**
Proactivity	-3.33	-0.36	-0.04	1.07	1.12	***
Participation	-4.15	-0.58	-0.21	1.07	1.01	***
Organization	-4.30	-1.26	-0.71	1.21	1.43	***
Listening	-4.35	0.28	0.63	1.05	0.91	***
Motivation	-4.53	-0.16	0.29	1.23	1.13	***
Interaction	-5.87	-0.03	0.46	0.96	0.94	***
Communication	-6.26	-0.33	0.26	1.15	1.06	***
Trust	-6.89	-0.78	-0.03	1.08	1.23	***
<b>Cluster 2</b>						
Openness	6.53	1.26	0.58	0.76	0.95	***
Curiosity	5.98	1.20	0.53	0.78	1.01	***
Interaction	5.63	1.04	0.46	0.86	0.94	***
Listening	5.22	1.15	0.63	0.67	0.91	***
Trust	4.57	0.59	-0.03	1.16	1.23	***
Initiative	4.23	0.94	0.52	0.82	0.91	***
Communication	3.35	0.65	0.26	0.99	1.06	***
Motivation	2.67	0.62	0.29	1.09	1.13	**
Participation	2.06	0.02	-0.21	1.05	1.01	*
Novelty	-1.96	-0.61	-0.34	1.31	1.23	*
<i>OIA3</i>	-2.28	3.84	4.28	1.87	1.76	*
<i>O2A2</i>	-2.33	3.90	4.34	1.78	1.69	*
<i>OIAI</i>	-2.74	4.05	4.53	1.66	1.61	**
<i>Mean PROD</i>	-3.48	4.03	4.42	1.06	1.02	***
Innovation	-3.70	-0.41	0.04	1.15	1.12	***
Vision	-3.93	-0.45	0.06	1.38	1.17	***
Organization	-4.04	-1.35	-0.71	1.53	1.43	***
Strategy	-5.04	-1.28	-0.53	1.43	1.36	***
Brainstorming	-5.09	-1.69	-0.95	1.38	1.32	***
Anticipation	-6.87	-1.64	-0.40	1.82	1.64	***
<b>Cluster 3</b>						
Organization	7.76	0.16	-0.71	1.06	1.43	***
Anticipation	5.55	0.31	-0.40	1.07	1.64	***
<i>OIAI</i>	5.49	5.22	4.53	1.39	1.61	***

Component	V test	Cluster mean	General mean	Cluster SD	General SD	p value
<i>PROD</i>	4.71	4.80	4.42	0.96	1.02	***
<i>OIA3</i>	3.83	4.81	4.28	1.69	1.76	***
Proactivity	3.75	0.29	-0.04	0.90	1.12	***
Strategy	3.71	-0.14	-0.53	1.19	1.36	***
Dynamism	3.62	0.28	-0.02	0.93	1.06	***
Communication	3.09	0.52	0.26	0.78	1.06	**
Brainstorming	2.74	-0.67	-0.95	1.10	1.32	**
Trust	2.62	0.22	-0.03	1.07	1.23	**
<i>O2A2</i>	2.32	4.64	4.34	1.59	1.69	*
<i>Managerial creativity</i>	2.24	5.76	5.60	0.85	0.90	*
Participation	2.19	-0.03	-0.21	0.82	1.01	*
Motivation	2.02	0.47	0.29	0.92	1.13	*
Change	-2.60	-0.61	-0.38	0.96	1.11	**
Initiative	-3.16	0.29	0.52	0.83	0.91	**
Innovation	-3.77	-0.29	0.04	0.97	1.12	***
Novelty	-3.80	-0.71	-0.34	1.04	1.23	***
Openness	-4.11	0.27	0.58	0.77	0.95	***
Idea	-4.70	-0.07	0.26	0.83	0.92	***
Moving outside the framework	-6.67	-0.99	-0.24	1.35	1.45	***
Imagination	-7.96	-0.66	0.12	1.14	1.25	***
Curiosity	-8.46	-0.14	0.53	0.94	1.01	***

*Note.* Items in italic correspond to supplementary quantitative variables that differ significantly between the clusters. SD = Standard deviation. Prod = Mean score for evaluations of productions.

Leaders in cluster 1 ( $N = 84$ ) rated more favorably items such as "Innovation", "Moving outside the framework", "Imagination" and "Novelty", and more negatively items such as "Trust ", "Communication " and " Interaction". Leaders in cluster 2 ( $N = 62$ ) consider that creativity is mainly characterized by items such as "Openness", "Curiosity", "Interaction", and undervalue items such as "Anticipation", "Brainstorming" and "Strategy" in comparison with leaders from other clusters. Finally, leaders in cluster 3 ( $N = 98$ ) conceive that managerial creativity is characterized by items such as "Organization", "Anticipation", and "Proactivity" and undervalue other items such as Curiosity ", " Imagination" and "Moving outside the framework".

The interpretation of the results for supplementary variables presented in Table 8 enables testing our second hypothesis. Indeed, when supplementary variables discriminate significantly a cluster (are present in one or two clusters), it signifies that the null hypothesis stating that the



level of the variable did not differ between clusters is rejected. Thus, for the specific variables that are presented in Table 8, leaders with dissimilar implicit theories have different evaluations of them. Hypothesis 2.a. postulated that managers who hold different implicit theories report different adoption of the creative behaviors. Leaders' creative behaviors were organized in three dimensions: "Creativity", "Managerial creativity" and "Management of creativity". In Table 8, we observe that the dimension "Management of creativity" is assessed differently by leaders in cluster 1 compared to other leaders. Indeed, leaders composing cluster 1 reported significantly less behaviors related to "Management of creativity" than leaders in other clusters. Moreover, leaders in cluster 4 evaluated significantly more positively the dimension "Managerial creativity". Managers with dissimilar implicit conceptions did not differently assess the third dimension of innovative behaviors.

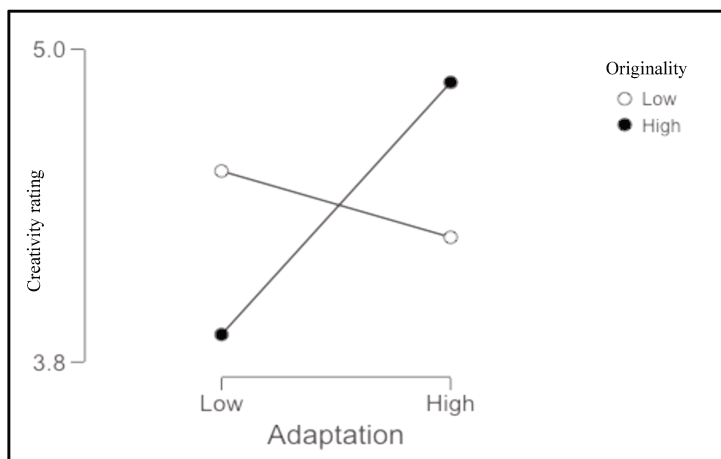
Hypothesis 2.b. postulated that managers with different implicit theories of managerial creativity have different perception of the characteristics of a creative manager. Characteristics of a creative manager were organized into five dimensions. As we can see in Table 8, only the dimension "Inventive" was differently evaluated between clusters. Leaders from cluster 1 perceived more than other leaders that a creative manager is characterized by adjectives that appeal *invention, imagination*. Leaders of different clusters did not differentially perceive the four other dimensions of characteristics of a creative manager.

Finally, hypothesis 2.c. postulated that evaluations of productions differed significantly between clusters. Indeed, leaders composing cluster 2 evaluated less positively managerial productions whereas leaders in cluster 3 rated in general more positively the productions. Leaders in cluster 1 rated significantly and less positively the production that was low on originality and poorly adapted. Because every aspect of the three dependent variables was not significantly different between clusters, we conclude that hypothesis 2 is partially supported.

Finally, we tested how the levels of originality and adaptation were considered in assessing the level of creativity of managerial practices. Hypothesis 7 assumes that managers with different implicit conceptions give different importance to the "original" and "adapted" components in their assessment of creativity. The cluster affiliation and the evaluations of four practices: O1A1, O1A3, O3A1 and O3A3) were subjected to an ANOVA: 3 clusters X 2 degrees of Originality X 2 degrees of Adaptation, the last two factors being repeated measures. The analysis reveals a main effect of the adaptation level,  $F(1.241) = 12.00, p < .001$ . Practices that are most adapted are therefore better evaluated than less adapted ideas ( $M_{A103, A303} = 4.58$ ;  $SD = 1.70$ ;  $M_{A101, A301} = 4.22$ ;  $SD = 1.81$ ). The simple effect of level of originality was not

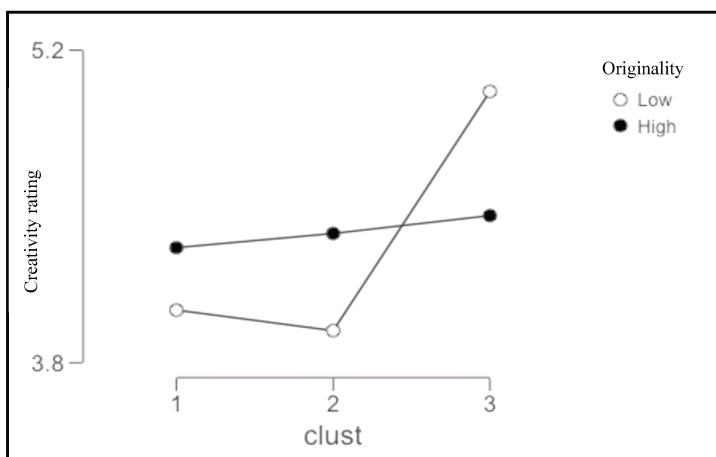
significant. Nevertheless, the interaction between the level of originality and adaptation was significant,  $F(1,241) = 37.29$ ,  $p < .001$  (see Figure 3). In Figure 3, we can see that a practice that is neither highly original nor adapted will be better evaluated than highly original but poorly adapted practice (O3A1). Furthermore, the practice evaluated as the most creative practice was, as expected, the highly adapted and highly original practice (O3A3).

*Figure 3.* Effect of the interaction between levels of originality and adaptation on creativity evaluation



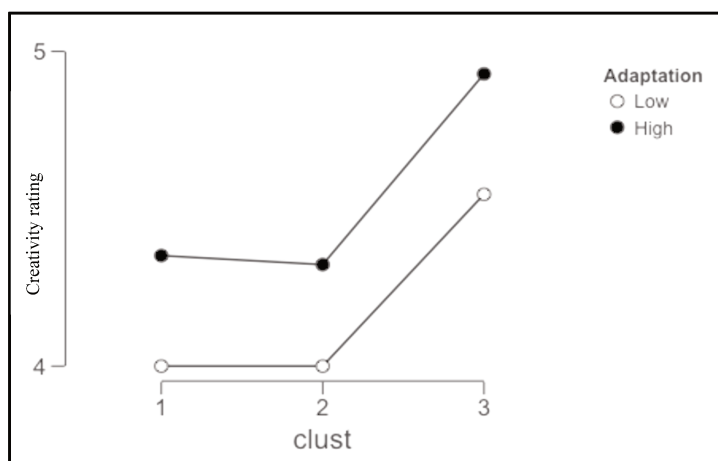
The interaction between the level of originality and cluster affiliation is significant,  $F(2,241) = 7.37$ ,  $p < .001$  (see Figures 4 and 5). Indeed, we can see on Figure 4 that clusters 1 and 2 evaluate original practices more favorably than non-original practices and that this effect is reversed for cluster 3.

*Figure 4.* Effect of the interaction between clusters and the originality feature on creativity evaluation



The interaction between the level of adaptation and cluster affiliation is not significant. Thus, for every leader, the more practices are adapted, the more they are rated as creative (see Figure 5). Furthermore, the interaction between levels of adaptation, levels of originality and cluster affiliation is not significant. Finally, as we identified in Table 8, the overall evaluation of practices is different according to the cluster belonging,  $F(2,241) = 9.48$ ,  $p < .001$ . The Levene test for homogeneity of variance was not significant,  $F(2,241) = 1.84$ ,  $p > .16$ . Leaders in cluster 2 assigned the least positive overall assessment ( $M = 4.03$ ,  $SD = 1.07$ ) followed by cluster 1 ( $M = 4.27$ ,  $SD = .92$ ). Leaders in cluster 3 evaluated more positively the overall practices ( $M = 4.80$ ,  $SD = .96$ ). Hypothesis 7 is therefore partially supported because leaders belonging to different clusters take differently into account the originality but not the adaptation feature in their evaluation of creative productions.

*Figure 5.* Effect of the interaction between clusters and the adaptation feature on creativity evaluation



## Discussion

The present research demonstrated that individual differences exist in leaders' conceptions of managerial creativity and these differences are related to their adoption of specific creative behaviors but also the characteristics they attribute to creative managers and their evaluation of creative practices. In practice, such differences could hinder organizations' ability to recognize creative managers and creative managerial practices. Indeed, if a creative manager is supervised by a leader who does not share his/her conceptions of creativity, the manager may not be rewarded for his/her creative work. Following the theories of social representations, conceptions of an object such as creativity are subject to change if the environment provides different information (Moscovici, 1961). Thus, we believe that organizations could

communicate and train leaders to recognize creative leaders and practices based on conceptions that are shared among employees.

Finally, in contrast with previous research (Benedek et al., 2016; Caroff & Besançon, 2008; Diedrich et al., 2015; Runco & Charles, 1993), evaluations depended mostly on the level of adaptation rather than originality. This result may be specific to creativity in the management domain. However, one limitation of the present study is that we assessed managers' evaluations on only five practices. Consequently, the present result would need further and steadier empirical validation.

## Chapter 4: General conclusion

The present results show that leaders' implicit theories of managerial creativity and of a creative manager are composed mostly of positive characteristics that are coherent with explicit theories. Indeed, implicit theories integrate attributes such as openness, motivation, novelty, and adaptability. Moreover, how managers conceive the relationship between creativity and innovation echo most research on the creativity and innovation process stating that managerial innovation results notably from creativity.

Based on findings of Mueller, Goncalo, and Kamdar (2011) and previous research on implicit theories of leadership (e.g., Epitropaki & Martin, 2004), we could have expected that creativity would be perceived as an antagonistic attribute for effective managers. Instead, implicit theories are principally composed of desirable characteristics for managers (e.g., *Energetic*, *Intelligent*, *Cooperative*). Some of these attributes may almost contradict explicit theories in the sense that they do not evoke attributes inherent to a creative person. For example, *Sincere* and *Honest* are characteristics presented in the Creative personality Scale (Gough, 1979), but as characteristics of a non-creative person. Moreover, the notable absence of undesirable or negative prototypical attributes could reveal the existence of an innovation bias. This interpretation is even more plausible because results from Study 1 show an unequivocal and accurate perception of the relation between creativity and innovation.

Admittedly, innovation is synonym of novelty, improvement and benefit, but most innovations do not emerge from a linear and easy to build process. They result from numerous back and forth movements between the different steps of the innovation process (Anderson, et al., 2014; Paulus, 2002) and, more importantly, they result from individuals' persistence, risk-taking (Jasper, 2010), tensions, paradoxes and contradictions (Bledow et al., 2009). However,

managers who emphasized the most innovation as a characteristic of creativity emphasized also traits of a manager that correspond to their abilities to create new practices rather than persist under difficult circumstances to implement their ideas. The under-representation of these difficult aspects of the creative and innovative process may entail consequences in organizational settings. Indeed, we saw in the Study 3 that implicit theories were worth studying notably because they influenced managers' behaviors and evaluations. In a professional setting, if managers are not conscious that innovation takes time, results from risk-taking and can lead to numerous failures before success, it is more likely that very few managerial innovations emerge and even fewer breakthrough innovations that require more persistence and risk (Madjar et al., 2011; Simonton, 2010).

In order to promote and normalize managerial creativity, executives may need to integrate that creativity as well as innovation involve a part of maladjusted characteristics, difficulties and obstacles. By doing so, they might be more apt to recognize managers who are able to question their practices and renew the way management is performed, and to offer them the opportunity of helping the organization to meet new organizational challenges. Despite this recommendation, the present result offers an optimistic outlook concerning the perception of creativity as an adapted and desirable characteristic for managers in today's organizations.

The present research could be seen as a first attempt to investigate managers' implicit theories of managerial creativity and innovation. As such, it requires further empirical studies. Future research could seek to confirm the present results by comparing implicit theories of a creative manager to implicit theories of a non-creative manager or a creative non-manager, similar to Runco, Johnson, and Baer (1993) when they investigated implicit theories of creative and uncreative children.

Moreover, the present studies did not consider how implicit theories of creativity and innovation could be socially constructed and could, in turn, impact the way groups of managers behave toward creativity. Implicit theories have been previously considered as socially-shaped schemata (Romo & Alfonso, 2003) and the theory of social representations aims precisely to study lay conceptions as socially constructed knowledge (Moscovici, 2008). Runco and Johnson (2002) adopted a similar approach when comparing parents and teachers' implicit theories of children's creativity. By identifying different groups of individuals in organizations who may share different representations of managerial creativity we could refine our understanding of how managerial creativity is perceived and assessed among distinct members of the organization.

However, study 3 revealed individual differences regarding managers' conception of creativity. Indeed, implicit theories could differ in terms of whether managers conceive creativity as primarily linked with *innovation*, *openness* or *organization*. Although every attribute reflects explicit theories, they highlight more or less the relative importance of the product (*innovation*), the individual (*openness*) or the process (*being organized*) in relation to creativity. Such differences in managers' conceptions led to disagreements on the evaluation of creative practices and the importance of characteristics such as imaginative, inventive or non-conformist as characteristics of a creative manager. Moreover, managers who attributed more importance to innovation (e.g., *moving outside the box*) were the ones who reported less behavior intended to support others' creativity, whereas managers who attributed more importance to organization (e.g., *anticipation*) reported more behaviors related to their own expression of creativity. Consequently, even slight variations on conceptions of creativity, despite that they all reflect explicit theories, can have great consequences when applied to a real setting. In line with previous research (e.g., Drazin et al. 1999), these conceptions can be perceived as an individual characteristic that influence how managers make sense of a situation and respond to it by engaging in creative actions.

Further research is needed to investigate the effect of implicit theories on managers' creative performance and to integrate implicit theories in a broader investigation of the antecedents of leaders' innovative work behaviors. However, we stated previously that implicit theories were theoretically part of the sensemaking process leading to creative actions. Thus, implicit theories of creativity could also be regarded as a moderator or mediator factor between individual and organizational factors and creative outcomes.

These three studies shed light on managers' conceptions of creativity and innovation when related to their activities. The results demonstrate that managers' implicit theories correspond to a great extent to explicit theories on managerial creativity and innovation. Moreover, managers emphasize different aspects related to creativity that influence their evaluations of creative managers and creative managerial practices but also determine their engagement in specific types of creative behaviors. As implicit theories may be shaped by organizations (Junker & Van Dick, 2014; Lord et al., 2001), executives could attempt to diffuse through communications conceptions of managerial creativity and innovation that are evidenced-based and exhaustive with regard to the different objects of application, and that include the difficulties and benefits of exerting creativity in managerial practices.

# Chapter 5: Why and when should managers be creative?

## Introduction

This chapter steps away from managers' conceptions of creativity to investigate managers' decision making process leading to their engagement in creative actions. The main objective of this chapter is to provide a more comprehensive picture of the conditions that influence managers' decision to innovate rather than adopt routine actions. As stated previously, the difference between creativity and change lays in individuals' deliberate intention to express creativity (Puccio et al., 2005). Consequently, we perceived a need to understand the antecedents of managers' deliberate intentions to engage in creativity. To do so, we relied on the *sensemaking* perspective (Drazin et al., 1999; Ford, 1996; Ford & Gioia, 2000). At the individual level, the *sensemaking* perspective implies that engagement in creative actions result from components of the situation but also from how these components are taken into account to develop systems of meanings about creative behaviors. Ford and Gioia (2000) focused on managerial decision-making relative to creative actions. They highlighted that managerial creative actions were not likely to occur as long as managers would believe that common solutions remain more appropriate. Thus, even if organizations support creativity and develop managers' creative abilities, managers may not perceive that these enhancing factors are sufficient reasons to switch from routine to creative behaviors.

The *sensemaking* process encompasses expectations regarding the appropriateness of creative actions in response to a specific situation and the effectiveness of the response (Ford, 1996). Perception of appropriateness can result from an evaluation of how the environment would react and support the potential creative solution. Effectiveness can result from an evaluation of one's creative abilities and environments' capacity to provide the necessary supplies. To operationalize the *sensemaking* process that mediates the effect of individual and organizational characteristics on leaders' engagement in creative actions, we relied on the Theory of Planned Behaviour (TPB, Ajzen, 1985, 1991; 2002; Fishbein & Ajzen, 2011). The TPB is an extension of the Theory of Reasoned Action (Ajzen & Fishbein, 1973, 1980) and provides an excellent

framework in order to conceptualize, measure, and empirically identify factors determining behavioral intentions and actual engagement in behavior (Conner & Armitage, 1998). As highlighted by Seligman (2006), the application of the TPB in organizational contexts is an acceptable representation of the *sensemaking* process related to creativity because it uses social, non-social and identity perceptions to predict behaviors.

According to the TPB, the adoption of behavior depends primarily on individuals' related intentions that are themselves predicted by three main variables: attitudes, subjective norms and perceived behavioral control (Ajzen 1991, 2002; Fishbein & Ajzen, 2011). These three variables will be referred to as the proximal antecedents of leaders' intentions. Attitude is defined as the latent disposition or tendency to respond with some degree of favorableness or unfavorableness to a psychological object. Regarding creative actions, attitude refers to individuals' favorableness regarding their adoption in a specific context.

Subjective norms are defined as an individual's perception that most people who are important to him/her think he/she should perform or not a particular behavior. The concept of subjective norms encompasses two types of normative pressure, the injunctive norm, which is the perception that our social environment expects us to adopt or not the behavior, and the descriptive norm that reflects the normative pressure experienced because important others are themselves performing or not the given behavior. Ford (1996) postulated that group norms had the potential to facilitate indirectly creative actions by activating goals, emotions, and receptivity beliefs (e.g., beliefs that creative actions are rewarded). The effect of the norms on creative intentions has been highlighted in previous research (e.g., Cloutier & Leroux, 1998). Regarding creative behaviors, the effect of norms seems to depend on the salience of social identity (Adarves-Yorno, Postmes, & Haslam, 2007).

Finally, perceived behavioral control is defined as the extent to which people believe that they are capable of performing a given behavior and that they have control over the performance (Fishbein & Ajzen, 2011). Perceived behavioral control regarding creativity was sometimes referred to as creative self-efficacy (Choi, 2012; Lim & Choi, 2009). Indeed, perceived behavioral control entails one's ability to perform efficiently the behavior. However, in Fishbein and Ajzen's (2011) perspective, perceived behavioral control includes two aspects: the individual *perceived capacity* to perform the behavior, which encompass the perceived ease to execute the behavior, the availability of information, resources, skills, opportunities, and the *autonomy* regarding the execution of the behavior which refers to the individual judgment that the execution and the performance of the behavior is entirely up to him. As a matter of fact, the



link between the concept of self-efficacy (Bandura, 1977; Bandura, 1989, 2001) and perceived behavioral control has been a subject of several studies and debates (e.g., Ajzen, 2002; Manstead & Eekelen, 1998). In the present research, we consider that perceived behavioral control differs from creative self-efficacy in the sense that the first takes into account the situation in which the individual will perceive that he/she has the capacity and autonomy to act creatively and it focuses on one specific creative behavior.

It is well known that the predictive importance of each antecedent varies depending on the behavior under study, the situations and individuals. The TPB has been already used to investigate the adoption of creative behaviors (Cloutier & Leroux, 1998; Goepel et al., 2012) and creative performance (Lim & Choi, 2009). For example, Cloutier and Leroux (1998) tested the effects of attitudes, norms and perceived behavioral control on students' intentions to adopt four general creative behaviors (e.g., create a gift from simple material). They found that the three antecedents and their interactions had different effects depending on the investigated behavior. Moreover, Fishbein and Ajzen (2011) assumed that observed differences in proximal variables (which refers to attitudes, subjective norm and perceived control) might result from different learning experiences that are likely to differ as a function of personal, social and cultural characteristics. Thus we may want to consider as distal factors every variable that might explain the different behavior-relevant proximal variables. Goepel et al., (2012) proposed a model of the antecedents of innovative behaviors in organizational settings. In this model, they included numerous distal variables (e.g., perceived organizational support, dissatisfaction with the status quo and personality traits) but to our knowledge the model has not been empirically tested and they did not refer explicitly to the sensemaking process. However, their theoretical model provides a detailed illustration on the use of the TPB to explain the link between distal and empirically tested antecedents of creativity and adoption of specific innovative responses.

In the present chapter, the TPB will be applied to investigate the antecedents of leaders' engagement of two different types of creative actions. These two types of creative actions were not selected randomly but have been identified as actions that were mostly absent in managers' repertoire, which hindered the development of managerial innovations. In Study 4, we investigate leaders' decision to solve problem by applying distinguished phases of divergent thinking and convergent thinking. Previous research highlighted that when leaders were confronted with problems, they had the tendency to converge directly, which hindered creativity (Basadur, 2004; Basadur & Basadur, 2011). Consequently, we seek to investigate

how individual and organizational characteristics influence, through the sensemaking process operationalized by the TPB, leaders' decision to solve problems by diverging before converging. In Study 5, we examine how managers take into account various factors when making the decision to respond to a specific problem by adopting innovative behaviors. To do so, leaders were confronted to a hypothetical problem: the implementation of telework. Thus, Study 4 focuses on a creative action that is mostly related to the phase of idea generation whereas Study 5 investigates the determinants of problem recognition.

## **Study 4. Solving problems creatively: effects of perceived interest**

Previous studies highlighted that managers engaged rarely in creative problem solving (Basadur, 2004; Ford & Gioia, 2000; Nutt, 1984). Basadur (2004) identified that one cause was managers' tendency to converge too rapidly by selecting one existing solution rather than applying divergent thinking to identify every potential solutions. Indeed, the creative problem solving is composed of three phases and each includes two sequenced steps of divergent and convergent thinking (e.g., Basadur et al., 1982; Mumford et al., 1991; Parnes, Noller, & Biondi, 1977). In the present study, convergent-thinking refers to the selection of one idea or the synthesis of several ideas based on the application of criteria (Lubart, 2017). The divergent-thinking step is necessary for managers to be able to find new solutions. Therefore, if managers do not solve problems by applying divergent thinking before convergent thinking, it is less likely that they will be in capacity to suggest creative solutions. Consequently, the present research investigates the antecedents of managers' application of a sequenced divergent-thinking, convergent-thinking process (DT-CT) in order to solve daily problems.

Following the premise that managers are not familiar with the DT-CT process (Basadur, 2004), we accustomed managers to this process before examining the antecedents of their intentions to apply it in their daily activities. Basadur, Graen, and Green (1982) studied the effects of training for engineers, engineering managers and technicians on creative problem solving. They noticed that training had a positive effect on attitudinal acceptance of the creative process and on practice of the ideation-evaluation process. From their results, we could conclude that, in order to improve leaders' use of the DT-CT process, organizations need simply to train them. Nevertheless, in the study of Basadur et al. (1982), ideation training consisted of asking participants to verbalize their wishes for a new product of the future. Thus, creative-problem

solving was, in this case, related to technological innovations, which does not imply the same antecedents as management innovation (Damanpour & Aravind, 2011). Indeed, for engineers who participated in the training program, creating new products is an inherent objective of their work; but in the case of management innovations, leaders are not specifically asked to create new practices. Rather, they are sometimes asked to conform to practices that are prescribed by the organization (Stacey, 1992). Thus, leaders' use of creative-problem solving may arise from different factors.

The present study investigates the effects of individual (cognitive, motivational and attitudinal) predispositions, as well as organizational characteristics as potential facilitating factors of managers' use of DT-CT. Moreover, we postulate that these effects are mediated by managers' *sensemaking* process (e.g., Drazin et al., 1999; Ford, 1996; Ford & Gioia, 2000). To assess the sensemaking process, we rely on the Theory of Planned Behaviour (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 2011) and test a theoretical model.

## Behavior: Using the Divergent thinking-Convergent thinking process

According to Fishbein and Ajzen (2011), the investigated behavior under research should be defined in terms of action, target, context and time. The action is expressed as a verb directed toward a target. In the present case, the behavior under research is "To use the Divergent Thinking – Convergent Thinking process when they are confronted with ill-defined problems in their daily work in the next three months". Fishbein and Ajzen (2011) highlighted the importance of focusing on a specific and personal behavior instead of a general one. Ettlie and O'keefe (1982) also made this call in the specific context of creative behaviors. In fact, asking leaders if they intend to be more creative in general may lead to biased answers. Indeed, leaders have their own conception of what can be considered as a creative behavior at work and can subsequently report adoption of behaviors that are not considered as pertaining to creativity by scholars. Moreover, managers may be influenced by the social desirability to fit the organization's expectations and therefore agree to intend to be creative without processing the related consequences. Investigating a specific behavior does not eliminate such risks but tend to reduce them. Furthermore, for Ajzen and Fishbein (1980), the TPB is more efficient to predict the behavior when the context and time are specified. For all these reasons, we ensured that leaders who participated in the present research will have the minimum knowledge about what

constitutes the DT-CT process by asking them to complete a divergent thinking and a convergent thinking task to solve a problem related to one of their leadership activities.

## Predictors of leaders' use of the DT-CT Process

### Intentions

Intentions are defined as indications of a person's readiness to perform a behavior. The essential underlying dimension characterizing an intention is the person's estimate of the likelihood or perceived probability of performing a given behavior (Fishbein & Ajzen, 2011).

Intentions are held to predict strongly the behavior when measured at the same level of specificity in relation to the action, target, context, and time frame (*ibid.*) and when the time interval between the measurement of intentions and actual behavior is short enough to ensure that intentions have not changed (see Randall & Wolff, 1994).

Hypothesis 1: Leaders' use of DT-CT process in their daily activities is positively predicted by their intentions to do so.

### Proximal antecedents of intentions to use the DT-CT process

#### *Attitudes toward the use of DT-CT process in leaders' daily activities*

As already mentioned, for Fishbein and Ajzen (2011), the intention to adopt a specific behavior is predicted by individuals' attitudes toward the adoption of the behavior, subjective norms and perceived control. Attitude refers, in the present study, to leaders' disposition toward the use of the DT-CT process in their daily activities in response to ill-defined problems or opportunities of enhancement. In the TPB, two types of attitudes can be distinguished: instrumental attitudes, referring to the perceived utility and the benefits emerging from the adoption of the behavior, and experiential attitudes, referring to pleasantness and satisfaction that individuals would experience if they adopted the behavior. Following Fishbein and Ajzen's (2011) conception, leaders' who perceive the added value of using the DT-CT process to solve work problems and who enjoy solving problems by using the DT-CT process will form greater intentions to apply this process in their daily activities.

Hypothesis 2: Leaders' attitudes toward DT-CT (instrumental and experiential) predict positively their intentions to use DT-CT in their daily work in the next three months.

### *Subjective norms*

Subjective norms reflect the influence that the social environment exerts on people's intentions and actions. This influence can focus on the environment expectations of one's behavior (injunctive norms) or the extent to which the behavior is adopted in the environment (descriptive norms). Creativity can sometimes be perceived as an opposition to group norms and conformity (e.g., Abrams, de Moura, Marques, & Hutchison, 2008). However, when individuals operate as members of a group, norms about creative actions were found to influence the individuals' innovative behaviors (Adarves-Yorno et al., 2007). We consider here that managers act mostly in regard to others' expectations, whether it is the team or their supervisors. Their actions are directed to affect in a way the work of other. Consequently, we postulate the subjective norms that support the DT-CT process will influence positively leaders' intentions.

Regarding injunctive norms, previous research demonstrated that individuals adopted more innovative behaviors and felt greater self-efficacy when their leaders, colleagues and groups expected and supported their creative initiatives (e.g., Choi, 2012; Liao, Liu, & Loi, 2010; Shalley et al., 2004; Zhou & Shalley, 2003). With regard to descriptive norms, Zhou (2003) stressed that the presence of creative coworker could have a positive influence on individuals' creativity under specific conditions. For example, he demonstrated that individuals were more creative when working with creative coworkers if their leaders did not closely monitor activities or if leaders provided developmental feedback (information that enables the employee to learn). In the present research, subjective norms are conceived as leaders' perception that using the DT-CT will be accepted or even supported by their environment and that it does not differ much from their peers' behaviors.

Thus, we posit that:

Hypothesis 3: Subjective norms (injunctive and descriptive) predict positively leaders' intentions to use DT-CT in their daily work in the next three months.

### *Perceived control*

The third and last proximal predictor of behavioral intentions is perceived behavioral control. Indeed, having a favorable attitude toward the use of DT-CT and social support when using it may not be sufficient to intend to execute such behavior. Leaders need also to feel capable of doing it. Regarding DT-CT, leaders need to feel that they are able to solve problems in a creative manner and they have the autonomy to solve problems by using the DT-CT process without asking anyone. In this context, perceived control can be related to research on creative

self-efficacy (Tierney & Farmer, 2002, 2011) or capability beliefs (Ford, 1996; Vroom, 1964) that demonstrated a direct positive effect on creative performance and behaviors.

Hypothesis 4: Perceived behavioral control (capacity and autonomy) predicts positively leaders' intentions to use DT-CT in their daily work in the next three months.

## Distal antecedents of leaders' intentions to use the DT-CT process

We wish now to consider background factors that may explain individuals' differences in the sensemaking process and their effect on managers' intentions. To do so, we identified cognitive, attitudinal, motivational and organizational factors that are postulated to influence managers' attitudes, subjective norms and perceived control over the use of the DT-CT process in their daily-activities. As highlighted in the third chapter of the present document, individual and organizational factors affecting creative performance are well known. Individual attributes are mostly categorized as personality traits, intrinsic motivation, expertise, and cognitive style (Amabile, 1983, 1996; Amabile & Pratt, 2016; Feist, 1999; Ford, 1996; Ward, Smith, & Finke, 1999; Woodman et al., 1993). Dimensions of the organizational climate that facilitate or impede individual creativity have been reviewed by Hunter, Bedell and Mumford (2005, 2007). However, if attributes affecting creative performance have been well-studied, even related to managerial creativity and innovation (e.g., Scratchley & Hakstian, 2001), we do not know much about how these attributes and creative performance influence leaders' decision to perform creatively in daily activities.

### *Cognitive factors: divergent and convergent thinking skills*

Cognitive abilities, and principally divergent and convergent thinking skills, have been intensely studied as a predictor of individuals' creative behaviors and performance (Amabile, 1988; Runco & Acar, 2012; Sternberg & Lubart, 1995; Torrance, 1966; Woodman et al., 1993). Baer (2012) demonstrated that divergent and convergent thinking skills could differ according to the domain of application. Thus, leaders' could perform greatly on a general creative task (e.g., finding several different uses for a box) but may be less efficient when the problem to solve is related to their professional activities. Also, divergent and convergent thinking performances are supposed to be better predictors of leaders' adoption of creative behaviors when both performance and behavior are applied to the same domain of endeavor (e.g., Pace & Brannick, 2010). We postulate that leaders who perform better in divergent and convergent

thinking tasks that are related to leadership problems will develop more positive attitudes, injunctive norms and perceived control over the adoption of the DT-CT process in their daily activities.

Moreover, leaders with past experiences in using the DT-CT process are supposed to perform better in divergent and convergent thinking tasks (Basadur et al., 1982). Thus, we suppose that leaders' experiences in using DT-CT influence proximal variables, with the exception of descriptive norms, through its effect on creative performance.

Hypothesis 5: Performance in DT-CT predicts leaders' intention to use the DT-CT process through its positive influence on (a) attitudes, (b) perceived control and (c) injunctive norms.

Hypothesis 6: Past experiences with DT-CT predicts leaders' intention to use the DT-CT process through its positive influence on (a) creative performance and (b) proximal variables (attitudes toward the use of DT-CT, subjective norms and perceived control).

#### *Attitudes toward ideation and evaluation*

According to Basadur and Hausdorf (1996), creative experience and performance in organizations are hindered by negative attitudes and stereotypes toward the different steps of the creative process. Basadur and Finkbeiner (1985) tackled the perception of the ideation and evaluation steps by studying attitudes toward new ideas and individual's tendency to (not) evaluate prematurely - preference for deferral of judgement. These attitudes had been investigated previously with regard to their effects on ideation-evaluation performance (*ibid.*). Basadur, Runco and Vega (2000) stated that, "unless the ideation-evaluation process is accepted attitudinally, then the process will not likely occur" (p. 81). In line with Basadur and co-authors' studies of attitudes toward creativity, leaders who are favorable to the ideation phase and who do not tend to evaluate prematurely their/others' ideas might have more intentions to use DT-CT when confronted to managerial problems (Basadur & Finkneiner, 1985; Basadur & Hausdorf, 1996; Basadur et al., 2000; Min Basadur et al., 1999). Moreover, we postulate that this effect will be mediated by managers' attitudes toward the use of DT-CT, perceived control and injunctive norms. We should highlight that the attitudes toward new ideas and attitudes toward premature evaluation differ theoretically from attitudes toward the use of DT-CT. Indeed, attitudes toward new ideas and premature evaluation are general disposition toward divergent and convergent thinking but do not imply that new ideas need to be generated by the manager himself/herself or that ideation and evaluation takes place in

his/her managerial activity. In contrast, attitude toward the use of DT-CT explicitly refers to managers' disposition toward their use of sequenced steps of divergent and convergent thinking in order to solve managerial problems.

Hypothesis 7: Positive attitude toward new ideas predicts leaders' intention to use DT-CT through its positive effect on (a) attitudes, (b) perceived control and (c) injunctive norms.

Hypothesis 8: Tendency to evaluate ideas prematurely predicts leaders' intention to use DT-CT through its negative through its positive influence on (a) attitudes, (b) perceived control and (c) injunctive norms.

#### *Motivation: Regulatory focus*

From an individual perspective, Higgins (1998) stated that motivation could be conceived as two qualitative types of orientations: promotion focus and prevention focus that differ regarding the needs individual wish to fulfill and the goals they desire to achieve. Promotion focus fulfills a need for nurturance. It is related to aspirations and accomplishments as desired goals, is sensitive to the presence or absence of positive outcomes, and highlights the importance of pleasure in work. In contrary, prevention focus fulfills a need for security; focuses on responsibilities and safety as desired goals, is sensitive to the presence or absence of negative outcomes, and highlights the importance of avoiding pain at work (Baas et al., 2008; Herman & Reiter-Palmon, 2011). Regulatory focus has been studied as an antecedent of creative performance and behaviors (e.g., Crowe & Higgins, 1997; Herman & Reiter-Palmon, 2011; Lam & Chiu, 2002). Previous research shows the positive effect of *promotion focus*, when associated with positive moods, on creative attitudes, behaviors and performance (for a meta-analysis, see Baas et al., 2008). *Prevention focus* has been mostly perceived as hindering creativity (Friedman & Förster, 2000, 2001, 2002). Thereafter, Baas, De Dreu and Nijstad (2008) demonstrated that creativity could increase when prevention focus activated positive moods (e.g., happiness) and decrease when it activated negative moods (e.g., fear). Thus, we postulate that leaders with a promotion focus will have more favorable attitudes, subjective norms and perceived control over the use of the DT-CT process. We make also the assumption that promotion focus positively predicts leaders' favorable attitudes toward ideation and deferral of judgment. Following Friedman and Foster (2000, 2001, 2002) and because we did not test leaders' moods, we assume that prevention focus will have the opposite effect from promotion focus.



Hypothesis 9: Promotion focus indirectly predicts intentions to use the DT-CT by increasing (a) attitudes toward the use of DT-CT, (b) perceived control and (c) injunctive norms.

Hypothesis 10: Prevention focus negatively and indirectly predicts intentions to use the DT-CT by decreasing (a) attitudes toward the use of DT-CT, (b) perceived control and (c) injunctive norms.

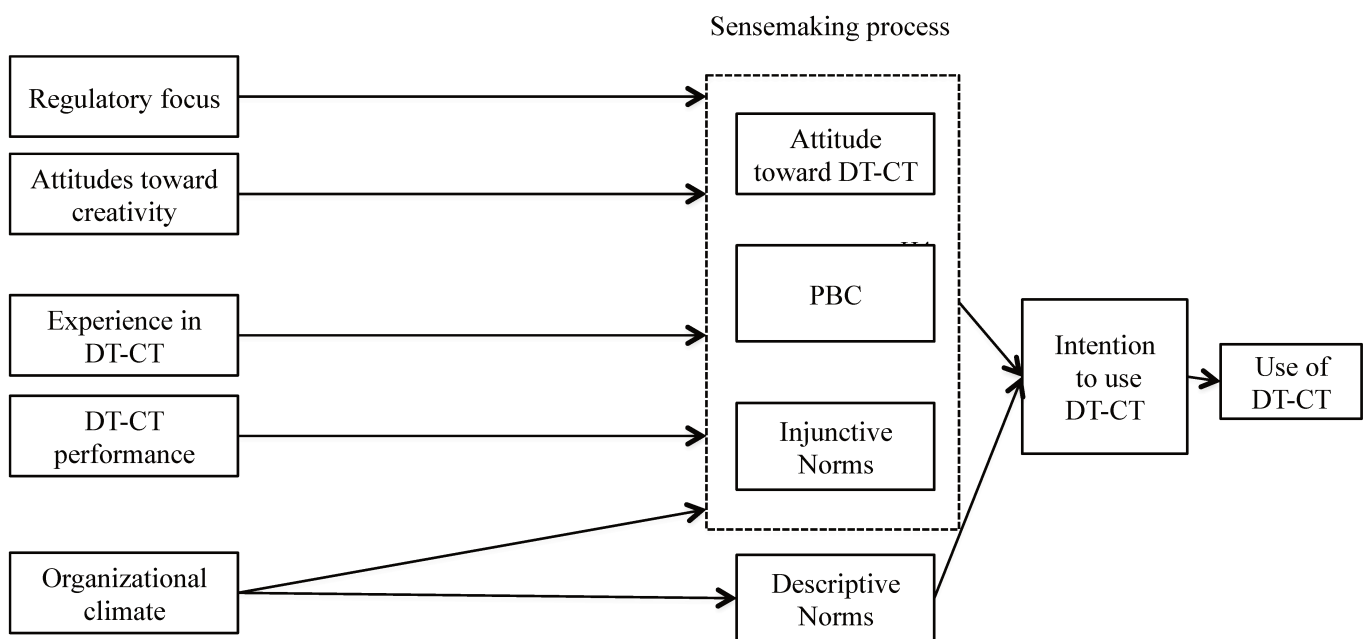
*Situational variable: Organizational climate for creativity and innovation*

The last predictor that we investigate as a factor influencing managers' intentions is organizational climate (Amabile, 1997; Amabile et al., 1996; Amabile, Schatzel, Moneta, & Kramer, 2004; Ford, 1996; Hennessey & Amabile, 1988; Mumford & Gustafson, 1988; Woodman et al., 1993). Climate refers to employees' perceptions of, or experiences in, their immediate work environment (Mathisen & Einarsen, 2004). By providing the necessary resources, such as support and information, organizations facilitate peoples' acceptance and use of creative problem solving in their work activities (Mumford, Whetzel, et al., 1997). Moreover, as postulated in theories on the sensemaking process of creativity (Drazin et al., 1999; Ford, 1996), the relevance of creative actions is assessed by taking into account the environment in which such actions have more or less chances to result in positive outcomes. Yuan and Woodman (2010) showed that perceived support for innovation predicted positively individuals' specific attitudes toward the adoption of innovative behaviors. Moreover, Choi (2012) demonstrated the mediated effect of organizational support on creative intention and performance through attitudes toward creativity and perceived behavioral control. Based on these authors' demonstrations, we postulate that leaders evolving in a supportive climate will have more positive attitudes toward the use of DT-CT, more perceived capacity and more favorable injunctive and descriptive norms. Previous research demonstrated that organizational climate for creativity is a result of multiple factors. As mentioned in Chapter 4, from a taxonomy proposed by Hunter, Bedell and Mumford (2005, 2007), we identified a general factor and four group factors: Encouragement and organizational support, Positive interpersonal relations, Autonomy and challenge, and Mission clarity (Caroff et al., 2016; Massu et al., 2017, see also Appendix 2.2.). Consequently, we will test the effects of these different dimensions of the creative climate but we consider that they all show the same pattern of effects.

Hypothesis 11: Organizational climate for creativity predicts positively intentions to use DT-CT through its positive effect on (a) attitudes, (b) perceived control, (c) injunctive norms and (d) descriptive norms.

The eleven hypotheses compose a theoretical model that aims to show how personal and organizational antecedents explain leaders' use of DT-CT in their daily activities through a sensemaking process. Figure 6 depicts the predicted model tested in this research.

*Figure 6.* Predictive model of antecedents of leaders' use of DTCT in their daily activities based on the Theory of Planned Behaviour



## Method

### Participants

Participants were 308 managers and collaborators from an international high-technology group that supplies systems and equipment in the aerospace and defense markets. Participants worked in fifteen different companies that are part of the group. The group provided us the opportunity to conduct the present research during training courses on management that took place in the corporate university. Consequently, employees who took part in training courses were contacted and solicited to participate in our study. In all, 234 managers completed the different steps of the study (except for the evaluation of the behavior). Four participants were identified through Mahalanobis distance as multivariate outliers,  $\chi^2(107) = 157.95$ ,  $p < .001$ , and were

subsequently deleted, resulting in a sample of 230 participants used for the final analyses. Descriptive statistics of the final sample are presented in Table 9.

*Table 9.* Descriptive statistics [Mean  $\pm$  SD or *N*(%)]

Variable	Participants (N = 230)
Sex (Male)	185 (80.4)
Age (years)	38 $\pm$ 8
Training	
Line Manager	163 (70.9)
Manager Leader	12 (5.2)
Managing Managers	55 (23.9)
Work domain	
R&D	75 (32.6)
Other	155 (67.4)
Position	
Line manager	149 (64.8)
Project manager	31 (13.5)
Senior manager	50 (21.7)
Professional experience (years)	14.8 $\pm$ 8
Managerial experience (years)	5.3 $\pm$ 5.9
Number of collaborators	16 $\pm$ 37

## Design and procedure

The present study was designed in four different steps. In the first step, we contacted managers who were enrolled in one of three management-training sessions. Two weeks before the training session, managers received an email on their professional address. We informed them that a PhD student working on managerial creativity was going to intervene at the beginning of their training session and will have them experiment the use of creativity in management problem solving. We notified them that the exercise was part of a scientific study and that their participation was anonymous and not mandatory. For those who agree to participate, we asked them to complete a first online questionnaire, created on Limsurvey<sup>®</sup>, by clicking on the provided link in the mail. This first questionnaire was composed of demographic items - sex, age, company, work domain, professional and managerial experience, managerial position, number of actual collaborators - and scales assessing distal variables - openness, regulatory focus, attitudes toward ideation and toward premature evaluation, and organizational climate. These scales will be presented shortly thereafter.

In the second step, participants experienced solving a managerial problem by using the DT-CT process and consecutively completed the scales assessing proximal variables and intentions. The second step was held at the corporate university and during the first day of participants' training session. Trainees who agree to participate were told they were about to work for fifteen minutes on an exercise that stimulates the production of creative solutions. Because divergent thinking tests on real setting problems are more predictive of applied creative performance and because validated tests assessing divergent and convergent thinking applied to management do not exist (Hakstian & Scratchley, 1995; Myszkowski et al., 2015; Okuda, Runco, & Berger, 1991), we designed a situational exercise that was specific to the organization where the study took place. We relied on the Leadership Model created and implemented in the group in 2011 in order to identify goals for leaders' practices improvement. The Leadership Model is composed of five dimensions that are leadership objectives aiming to maximize collective performance. Each of the dimensions involves for leaders to set individual goals and to question their actual behaviors. The dimensions are: *Leading by example*; *Empowering people*; *Embarking on a shared vision*; *Scoring as a Team* and *Daring to innovate*. Thus, participant are more or less familiar with the five dimensions and are supposed to seek new practices that will help them and their team improve their performance on each dimension.

The dimensions were reformulated as questions or challenges: (1) How to be an exemplary manager for your teams?, (2) How can you empower your team members? (3) How to instill a vision and share it in your team?, (4) How can you help improve team spirit?, (5) How can you encourage innovation in your team?.

Participants were asked to select one managerial challenge among the five and that they will have to find new solutions to implement for this challenge. Thirty-eight participants selected challenge 1, 51 selected Challenge 2, 32 selected Challenge 3, 79 selected Challenge 4 and 51 selected Challenge 5. Reiter-Palmon, Illies, Cross, Bulbotz and Nimps (2009) demonstrated that the type of problem-solved influences creativity. However, because participants were not constrained regarding the challenge to select, their decision mirrors their capacity to identify problems that are relevant for creative solving. Thus, we decided to not control this effect, as it would disadvantage participants with better problem identification skills. Then, for the Divergent-thinking step, they were given the instructions to write as many ideas of practices, behaviors, processes that could respond to the challenge. They had eight minutes to complete this step of divergent thinking, which has been shown to be a sufficient time to start reporting

creative ideas (Beaty & Silvia, 2012). This task was scored in terms of fluency, which was the number of ideas given by the participants.

After the eight minutes, the Convergent-Thinking step was introduced. Participants were given five minutes to find and elaborate the most creative managerial practice to solve the challenge. Giving participants explicit instructions to be creative has been found to increase their performance (Harrington, 1975; Niu & Liu, 2009). Thus, managers were given the following definition of a creative idea: “an idea that is original, new for you and your team, and adapted in the way that it answers the challenge”. Then, they were told that, in order to select the most creative idea, they had the possibility to pick one they created in the divergent thinking step, to assemble two or more previous ideas or to create a new one.

After this exercise, participants were debriefed. We informed them that the two sequences they went through are two steps of the creative process and that research found that the divergent thinking step is less visible, less promoted and rewarded in management setting. However, spending more time diverging on management related problems might help them to find more creative solutions and practices in their daily activities. Then, they were asked to complete a paper and pencil questionnaire to collect their opinions on this two-step process and their intention to use it when confronted to management problems or opportunities of enhancement. The paper questionnaire was composed of scales assessing variables of the theory of planned behavior – attitudes toward the use of DT-CT, perceived control, subjective norms and intention. These scales will be presented in the next section.

Five months after the intervention, participants were contacted by mail and asked to complete the last part of the questionnaire that assessed the adoption of the behavior and asked open questions about the contexts in which they used the two-step process and/ or the reasons why they did not use it.

## Measures

Measures of intentions, attitudes toward the use of DTCT, subjective norms and perceived behavioral control were constructed following the methodology proposed by Fishbein and Ajzen (2011; see also Francis et al., 2004) and were adapted to the specific behavior under research: “ the use of the DT-CT in daily activities in the next three months”. With the exception of Attitudes toward the use of DT-CT, each scale was composed of affirmations toward which participants were asked to give their degree of agreement on 7-point Likert scales (from 1-Totally disagree to 7-Totally agree). The validity of the scales has been tested by

means of factor analyses. We conducted principal component analyses (PCA) for every scale that were created or adapted. For these scales, parallel analyses (Horn, 1965) were performed to identify the number of factors to retain for each scale. For the scales that have been translated from English, we conducted confirmatory factor analyses (CFA) to corroborate the structure of their measures. .

#### *Dependent variables*

*The actual use of DT-CT in leaders' daily activities* was assessed by one item: "To what extent have you used the DT-CT process in your daily activity these past five months?" Participants were asked to answer on a 7-point Likert scale ranging from Not at all to Very regularly, and to provide more details by answering two open questions: "What reasons impede you to use the DT-CT process?" and "If you used it at least once, can you provide an example of problem or challenge that you solved by the using the DT-CT process?"

*Intention to use the DT-CT process* was assessed by six items. A sample item is "I intent to use the DT-CT at work when I will confronted to problems in the next three months". A PCA was conducted (KMO = .82; Bartlett's test:  $\chi^2(15) = 536.8, p < .001$ ). A single factor was identified, explaining 54% of the total variance. Factor loadings were comprised between .65 and .83. Consequently, every item was retained for further analyses.

#### *Proximal variables*

*Attitudes toward the use of DTCT* was assessed using the semantic differential technique (Osgood, 1964; Osgood, Suci, & Tannenbaum, 1970). Researcher selected ten pairs of bipolar adjectives, five reflecting cognitive attitudes and five reflecting affective attitudes. For example, managers had to rate to what extent using DT-CT in their daily activities would be "Useless" to "Useful" on a 7-point evaluative semantic differential scale. A PCA was conducted (KMO = .81; Bartlett's test:  $\chi^2(45) = 789.48, p < .001$ ). As predicted by Fishbein and Ajzen (2011), a single factor was identified, but it explained only 38% of the total variance. The three items that had positive adjectives placed on the left side of the semantic scale had negative loadings on the single factor, even after we reversed their scores. Moreover, two items had loadings inferior to .50. When removing these five items, a single factor explained 61% of the total variance and every item's factor loadings were comprised between .67 and .83 and were retained for further analyses.

*Subjective norms* was assessed using 9 items (5 items for the injunctive norms and 4 for the descriptive norms). Sample items are "Most people that are important to me in my organization would not understand if I used the DT-CT process" (reversed) for the injunctive norms, and "In

my organization, most managers use approaches similar to the DT-CT process when faced with problems” for the descriptive norms. According to a parallel analysis, two factors were necessary and explained respectively 34% and 21% of the total variance. A PCA was conducted ( $KMO = .85$ ; Bartlett’s test:  $\chi^2(36) = 594.75, p < .001$ ) with varimax rotation. Two items assessing injunctive norms were removed because they did not load on their theoretical factor. A second parallel analysis revealed that two factors were still necessary to represent our data. The two factors explained respectively 36% and 25% of the total variance. Factor loadings of the items on their factors ranged between .65 and .82 and loadings for the other factor did not exceed .36. Consequently, subjective norms will be conceived in terms of two different constructs: injunctive norms, assessed by three items, and descriptive norms, assessed by four items.

*Perceived behavioral control* was measured by four items assessing the *autonomy* facet and five items assessing the *perceived capacity* facet. A sample item for the autonomy measurement is “I am free to use the approach I want in order to solve the problems that my team and I are facing.” A sample item for the capacity measurement is “I feel able to use the DT-CT process effectively”. A PCA was conducted ( $KMO = .81$ ; Bartlett’s test:  $\chi^2(36) = 1182.63, p < .001$ ). Two factors were necessary, explaining each 33% of the total variance. After running principal component analyses with varimax rotation, the five items assessing perceived capacity were principally loading on the first factor and the four items assessing autonomy loaded on the second factor. Items’ loadings on their respective factors ranged between .56 and .93, and loadings for the other factor did not exceed .13. Consequently, perceived behavioral control will be conceived as two different constructs: perceived capacity and autonomy.

#### *Distal variables*

*Fluency.* If fluency should not be confounded with creative performance, it gives still a clue on the participants’ performance regarding divergent-thinking tests (Runco, 2008). During the second phase of the research, participants were asked to select a challenge and then were given eight minutes to write as many solutions as they could. The fluency score corresponded to the number of different ideas that participants wrote in the divergent thinking phase.

*Ratings of creative performance.* Following the Consensual Assessment Technique (Amabile, 1982), five experts rated the practices that participants presented in the convergent-thinking step. Experts were managers with a noticeable experience in the group (at least 15 years) and were familiar with their organization’s Leadership Model. Experts were asked to rate the level

of creativity for the 251 ideas produced by all participants on a 7-point Likert scale ranging from 1 – Not creative at all to 7 – Extremely creative. We assessed the consistency of raters' evaluation using the Cronbach's alpha coefficient. Because the level of alpha was good ( $\alpha = .96$ ; 95%IC [.90, .99]), experts' ratings were averaged for each idea. Thus, a score of creative performance was attributed to each participant and correspond to the average scores given by experts for his/her idea. The mean score of creative performance was 4.51 ( $Min = 2.6$ ,  $Max = 6.6$ ,  $SD = .71$ ). Participants' creative performance did not differ significantly between the different challenges,  $F(4,241) = 2.06$ ,  $p > .05$ .

*Past experiences of the use of the DT-CT process* were assessed by three items adapted from Ajzen and Fishbein's (2011) methodology. A sample item is "I used previously the DT-CT process in order to solve problems at work". A PCA was conducted ( $KMO = .60$ ; Bartlett's test:  $\chi^2(3) = 92.01$ ,  $p < .001$ ). A single factor was identified, explaining 57% of the total variance. Factor loadings were comprised between .66 and .82. Consequently, we retained every item for further analyses.

*Leaders' attitudes toward ideation and evaluation* were assessed by using the subscales *Preference for ideation* (6 items) and *Tendency to (not) evaluate prematurely* (8 items) developed by Basadur and Finkneiner (1985). We conducted a confirmatory factor analysis (CFA) to ensure that items loaded on two different latent variables in the present data. Indices of fit were acceptable only after removing two items<sup>9</sup> from the scale *Preference for ideation* and fixing a correlation between errors for two items of the scale *Tendency to (not) evaluate prematurely* ( $\chi^2 = 83.84$ ,  $df = 52$ ,  $p < .05$ ; CFI = .94; NNFI = .92; RMSEA = .05; SRMR = .06). Consequently, four items assessing attitudes toward ideation and eight items assessing attitudes toward evaluation are retained for further analysis.

*Regulatory focus* was assessed by the *Work Regulatory Focus Scale* developed by Neubert, Kacmar, Carlson, Chonko, and Roberts (2008). The 18 items that compose the scales were initially created to reflect the two regulatory focus's components as postulated by Higgins (1997). The validation study realized by these authors confirms that two dimensions composed the scale, assessing respectively Promotion (9 items assessing gains, achievement and ideals) and Prevention focus (9 items assessing security, oughts and losses). We conducted a confirmatory factor analysis (CFA) to ensure the replication of the structure of the scale for the present data. Indices of fit were acceptable only after removing two items from the promotion

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<sup>9</sup> Items that have been removed from every scale are presented in italic in Appendix 4.1.



focus dimension, and fixing seven correlated errors for items loading on the same dimension ( $\chi^2 = 185.12$ ,  $df = 96$ ,  $p < .05$ ; CFI = .92; NNFI = .90; RMSEA = .06; SRMR = .07).

*Organizational climate* was assessed by the French Organizational Climate for Creativity and Innovation Scale (OCCIS: Caroff et al., 2016, 2015; Massu et al., 2017). The questionnaire is supposed to assess a general factor loading all the 24 items, and four group factors (Encouragement and organizational support, Positive interpersonal relations, Autonomy and challenge, and Mission clarity). For the present study, a confirmatory factor analysis confirmed that the bifactor model fit the data ( $\chi^2 = 298.71$ ,  $df = 228$ ,  $p < .05$ ; CFI = .96; NNFI = .96; RMSEA = .04; SRMR = .06).

## Results

### Measurement model

We tested the reliability and validity of our measurement model by conducting a series of CFA and interpreting the factor loadings, the average variance extracted (AVE) and the composite reliabilities (CR). The first tested model included every remaining item after the selection from the PCA and CFA on the scales and postulated the different constructs under measure. Results for this first model showed an unacceptable fit with the data ( $\chi^2 = 4672.21$ ,  $df = 3261$ ,  $p < .05$ ; CFI = .80; NNFI = .79; RMSEA = .04; SRMR = .07). Based on the suggested modification indices and the standardized expected parameter change (Rosseel, 2012; Whittaker, 2012), we improved the model by removing three items assessing intentions, one item assessing attitude toward the use of DT-CT, one item assessing injunctive norms, one item assessing descriptive norms, one item assessing perceived capacity, the three items assessing past experiences, one item assessing attitudes toward ideation, five items assessing attitudes toward evaluation, four items assessing promotion focus and five items assessing prevention focus. We specified one correlated error between two items of the scale of perceived capacity. This second model shows an acceptable fit with the data ( $\chi^2 = 1913.21$ ,  $df = 1418$ ,  $p < .05$ ; CFI = .90; NNFI = .89; RMSEA = .04; SRMR = .06). Table 10 presents a summary of the variables assessed by scales in the present study, the original and final number of items. From this final selection of items, we computed the means, standard deviations and correlations among the variables that are presented in Table 11. To investigate the reliability and validity of the fifteen remaining constructs (every item of the past experiences scale was removed), we estimated the factors loading for each item on their respective construct, and calculated the CR and AVE. These

coefficients were estimated using a maximum likelihood technique (Fornell & Larcker, 1981). We also calculated the Cronbach's alphas for each construct. All these estimates are presented in Appendix 4.1.

*Table 10.* Summary of variables and number of items

Variables	Original number of items	Final number of items
Intentions	6	3
Attitudes toward DT-CT	10	4
Injunctive norms	5	2
Descriptive norms	4	3
Perceived autonomy	4	4
Perceived capacity	5	4
Past experiences	3	0
Preference for ideation	6	3
Tendency to (not) evaluate prematurely	8	3
Promotion focus	9	3
Prevention focus	9	4
Organizational climate	24	24

We looked first at the standardized coefficients for each item on their respective construct. Except for the scale of organizational climate, every item had standardized coefficients superior to .50 and loaded significantly on their underlying construct ( $p < .001$ ). Because the scale of organizational climate applies a bi-factor model, lower factor loadings on either the general or the four group factors were expected (e.g., Gonzalez & MacKinnon, 2016; Reise, 2012; Rodriguez, Reise, & Haviland, 2016). Thus, following previous examples (e.g., Jennrich & Bentler, 2011; Reise, Moore, & Haviland, 2010), we kept every item of the organizational climate scale even though they did not have high standardized coefficients.

According to criteria given by Fornell and Larcker (1981; see also Peng & Lai, 2012), values of CR should exceed .70 to conclude in favor of a sufficient reliability, and values of AVE should be greater than .50 to consider the constructs to be valid. Two scales had CR inferior to .70 (Attitudes toward ideation: .60, and Injunctive norms: .67) and the group factor Mission clarity of the organizational climate scale showed a CR of .60. Regarding the AVE<sup>10</sup>, the scales attitudes toward ideation and the subscale Prevention focus had estimates under .50

<sup>10</sup> AVE could not be computed for the general and the group factors structuring the Organizational climate scale because of its bi-factor model structure. Consequently, we only relied on the CR and the Cronbach's alphas to attest the validity of the constructs.

(respectively .33 and .48). Consequently, these four constructs were not included in further analyses. To confirm the discriminant validity of our constructs, we needed to verify that the average variances between the constructs and their items are greater than the variance shared between scales. To do so, we compared the square root of average variance extracted for each construct with its correlations with other constructs. As reported in Table 11, every square root of average variance extracted is greater than the correlations between the constructs, providing support for the discriminant validity.

Table 11. Means, standard deviations, composite reliabilities, average variance extracted, correlations and Cronbach's alphas

Variable	M	SD	CR	AVE ( $\sqrt{\text{AVE}}$ )	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Intentions	5.28	1.04	.83	.63 (.79)	(.82)																
2. Attitudes toward the use of DT-CT	5.16	0.99	.85	.58 (.76)	.48**	(.84)															
3. Perceived capacity	4.32	1.22	.74	.50 (.71)	.45**	.27**	(.84)														
4. Autonomy	5.49	1.37	.88	.64 (.80)	.24**	.04	.33**	(.87)													
5. Injunctive norms	4.50	1.26	.67	.51 (.71)	.24**	.13	.22**	.30**	(.67)												
6. Descriptive norms	3.31	1.32	.77	.53 (.73)	.19**	-.02	.22**	.09	.45**	(.77)											
7. Promotion focus	4.48	1.19	.77	.52 (.72)	.20**	.14*	.13*	-.08	.06	.13*	(.77)										
8. Prevention focus	4.45	1.09	.84	.48 (.69)	.11	.01	-.06	-.07	.06	.10	.19**	(.72)									
9. Attitudes toward ideation	4.51	1.01	.60	.33 (.57)	.28**	.14*	.15*	-.07	.04	.07	.12	.09	(.59)								
10. Attitudes toward evaluation	3.54	1.31	.77	.53 (.73)	-.03	-.05	-.13	-.18**	-.15*	.02	.06	.32**	-.15*	(.75)							
11. Fluency	9.03	3.94			.15*	.10	.30**	.19**	.15*	.01	.11	.03	.08	-.13*							
12. Creative performance	4.51	0.72			.03	-.03	.06	.12	-.01	-.11	-.11	-.17**	-.12	-.18**	.02						
13. Organizational climate	4.94	0.66	.88		.09	.05	.09	.08	.24**	.19**	.08	.02	.10	-.09	.04	-.05	(.83)				
14. Organizational support	4.24	0.95	.71		.14*	.03	.14*	.10	.23**	.27**	.11	.11	.21**	-.11	.10	-.05	.73**	(.78)			
15. Positive interpersonal relationships	5.09	0.90	.71		-.03	.01	-.04	.09	.15*	.07	.06	-.01	-.05	.03	.01	-.08	.70**	.28**	(.80)		
16. Challenge and autonomy	5.84	0.78	.72		.10	.07	.13*	.09	.12	.12	.10	-.04	.03	-.13	-.00	-.06	.76**	.43**	.42**	(.85)	
17. Mission clarity	4.57	0.93	.58		.05	.04	.03	-.04	.21**	.08	-.02	-.03	.09	-.07	.01	.03	.77**	.40**	.38**	.46**	(.74)

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < .01$ . M, SD, CR and AVE are used to represent mean and standard deviation, composite reliabilities and average variance extracted respectively. Values of Cronbach's alpha are presented in diagonal.

## Common method variance

The present data were collected at three different times for each participant and through different forms of questionnaires, which is assumed to lessen the biases associated with self-report measures (MacKenzie & Podsakoff, 2012; Podsakoff et al., 2012; Podsakoff et al., 2003). Moreover, performance in DT-CT was assessed through a task completed by the participants, which did not imply any self-report of their performance and helped break the monotony of self-report measures. We tried also to avoid the bias of inflated correlations by using negative and positive affirmations, and the biases of common scale formats and common scale anchors by using Likert scales and semantic differential scales. Consequently, potential method biases should be very limited in the present study. However, we had to make substantive modifications in order to fit the measurement model to the present data. Such a need for changes could signify that common method biases constitute nevertheless a problem for the present data. Consequently, we conducted further analyses in order to ensure that the variability we wanted to analyze was mostly due to the different constructs under study rather than the method of measurement (Podsakoff et al., 2003; Podsakoff et al., 2012).

To control the extent to which common method variance constitutes a problem for the present data, we conducted first a Harman one-factor test on every item that was selected after the final selection. This factor accounted for 13.4% of the variance, which is clearly insufficient to explain the majority of the covariance between the variables. A second one-factor analysis was conducted only for items that were assessed at time 1 through an online questionnaire. This factor accounted also for a small part of the variance (20%) and probably was insufficient to explain the covariance between the variables. However, Podsakoff et al., (2003) advised conducting further controls for common method bias. Consequently, we conducted also two CFA. The first CFA postulated that all items loaded on one single factor. Indices of fit demonstrate that such model does not fit the data ( $\chi^2 = 4389.16$ ,  $df = 1127$ ,  $p < .05$ ; CFI = .27; NNFI = .24; RMSEA = .11; SRMR = .13). A second CFA was conducted stating a two-factor model where items collected in time 1 were allowed to load on one factor and items collected in time 2 on a second factor. This model demonstrated also a poor fit to our data ( $\chi^2 = 3631.16$ ,  $df = 1126$ ,  $p < .05$ ; CFI = .44; NNFI = .41; RMSEA = .10; SRMR = .11). Based on these results and the characteristics of our study design, we feel comfortable to state that the common method variance problem may not represent an important threat for the forthcoming statistical analyses.

## Strategy of analysis

We used structural equation modeling (SEM) to test the hypotheses deriving from the predictive model of managers' intention to innovate. The use of SEM allows testing direct and indirect effects of latent constructs instead of composite scores, which reflects more correctly the relations between items and their constructs. Moreover, SEM has been acknowledged as a relevant approach for testing mediation as it helps controlling estimates biases and suppression effects (Cheung & Lau, 2008; MacKinnon, Lockwood, & Williams, 2004). Analyses were conducted with R statistical software (R Development Core Team, 2016) using the packages *apaTables* (Stanley, 2017), *lavaan* (Rosseel, 2012), *paran* (Dinno, 2012), *psy* (Falissard, 2012), *psych* (Revelle, 2017) and the *semTools* (Contributors, 2016).

Parameters of the model were estimated using maximum likelihood (Kline, 1998). Following recommendations by Hu and Bentler (1999), we used several goodness-of-fit indices to evaluate the fit of the different models: the chi-square test, the comparative fit index (CFI, Bentler, 1990), the nonnormed fit index (NNFI, Bentler & Bonett, 1980), the root-mean-square error of approximation (RMSEA), and the standardized-root-mean-square residuals (SRMR, Browne, Cudeck, & Bollen, 1993). Finally, the Monte Carlo method was used to test the statistical significance of the variables' indirect effects (2016).

## Model testing

We recall that to ensure the validity of our measurement model we removed several scales: Past experiences with the use of DT-CT, Attitudes toward ideation, Prevention focus and Injunctive norms. Consequently, hypotheses related to these variables could not be tested. Moreover, only 45 participants completed the last part of the study (20%), which constrained the possibility to test the effect of intention on the adoption of behavior. Thus hypothesis 1 was not tested. However, we were able to calculate the correlation between leaders' intentions and their reported behaviors, which was found to be very weak ( $r = .06$ ).

Nevertheless, when analyzing the answers of the 45 participants that completed the last part of the study, we found that they used the DT-CT process to a very small extent ( $Mean = 2.78$ ). Those who answered the open question "What are the reasons that have sometimes or systematically prevented you from using DT-CT?" stated primarily a lack of time ( $N = 20$ ) and a lack of opportunities or perceived problems to solve creatively ( $N = 10$ ).

We tested the predictive model presented in Figure 6 with the remaining constructs. Output from the SEM model is presented in Appendix 4.2. We specified the correlations between every distal variable. Moreover, we assessed every direct, as well as the hypothesized indirect effect of the variables on managers' intentions to use the DT-CT. Results show an acceptable fit between the model and our data ( $\chi^2 = 1441.07$ ,  $df = 1048$ ,  $p < .05$ ; CFI = .91; NNFI = .90; RMSEA = .04; SRMR = .06). The model accounted for 44.2% of explained variance for participants' intentions to use DT-CT in their daily activities ( $R^2 = .09$  for attitudes toward DT-CT,  $R^2 = .12$  for autonomy,  $R^2 = .18$  for capacity, and  $R^2 = .06$  for descriptive norms).

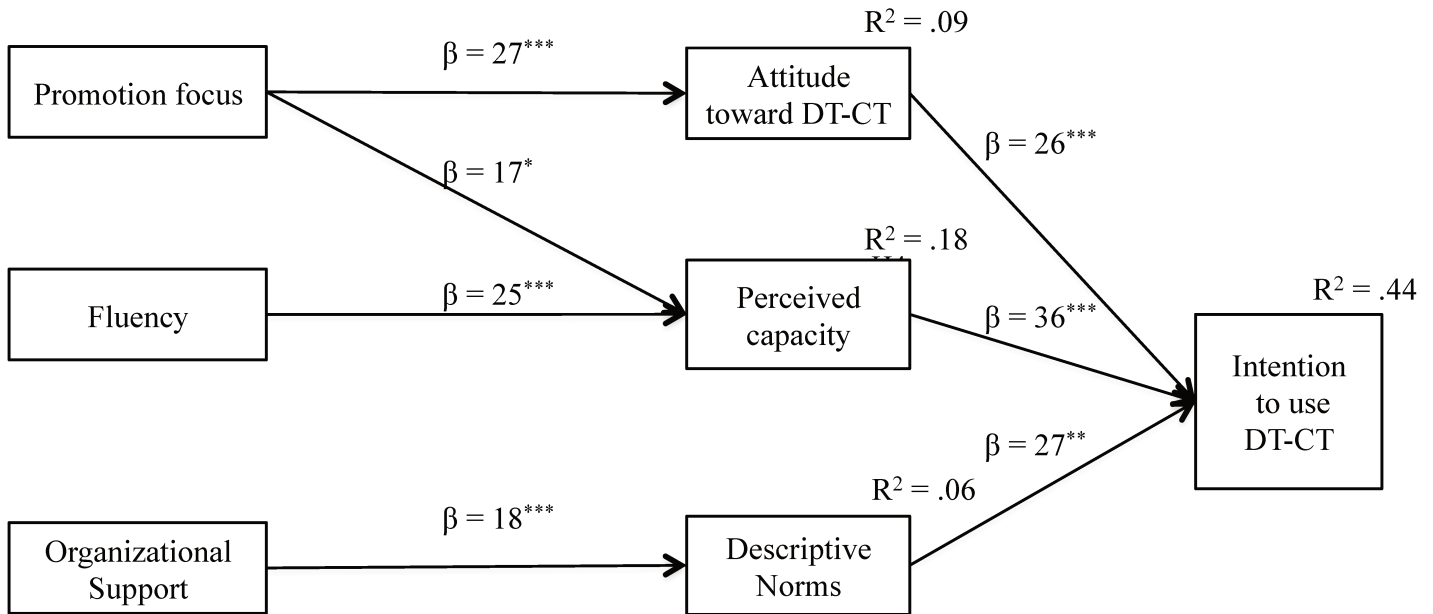
## Hypothesis testing

Figure 7 presents every significant effect for the structural part of the model. As we can see of Figure 7, none of the distal antecedents had a significant direct effect on intention to use DT-CT. Consequently, every effect of distal variables are indirect or mediated by variables that compose the sensemaking process. Intention to use DT-CT was predicted directly by attitudes toward the use of DT-CT ( $\beta = .26$ ,  $p < .001$ ), supporting hypothesis 2. Perceived capacity ( $\beta = .36$ ,  $p < .001$ ) predicted directly intention to use DT-CT but perceived autonomy did not show the expected positive and significant effect; therefore hypothesis 3 is only partially supported. Intention to use DT-CT was also directly predicted by descriptive norms ( $\beta = .27$ ,  $p < .001$ ) and the effect of injunctive norms could not be tested; thus, hypothesis 4 is only partially supported.

Hypothesis 5 stated the effects of creative performance (fluency and creative scores) on (a) attitudes toward DT-CT, (b) perceived control and (c) injunctive norms. The score of creativity rated by judges did not show any significant effects on attitudes toward the use of DT-CT, perceived control, descriptive norms nor a direct effect on intentions. Regarding fluency scores, participants had on average 9 ideas ( $Min = 2$ ,  $Max = 35$ ,  $SD = 3.94$ ). The number of ideas differs significantly according to the challenge they selected,  $F(4,225) = 2.91$ ,  $p < .05$ . Participants who selected Challenge 5 (How to encourage innovation in your team) had the greatest number of ideas ( $M = 10.2$ ) whereas participants who selected Challenge 3 (How to instill a vision and share it in your team) had the lowest number of ideas ( $M = 7.8$ ). Fluency predicted significantly perceived capacity ( $\beta = .25$ ,  $p < .001$ ). The indirect effect of fluency on intentions through perceived capacity was significant but weak ( $b = .02$ , 95% CI [.007, .040]). Thus, hypothesis 5b is supported only for the fluency predictor and the outcome perceived capacity, whereas hypothesis 5a is

completely rejected because neither fluency nor creative score predicted attitudes toward the use of DT-CT. Hypothesis 5c could not be tested because injunctive norms were not included in our predictive model.

Figure 7. Antecedents of managers' use of the Divergent-convergent thinking process



Note. \* indicates  $p < .05$ , \*\* indicates  $p < .01$ , \*\*\* indicates  $p < .001$ .

Hypotheses 6 and 7 could not be tested because the constructs of past experiences with DT-CT and attitudes toward ideation were removed from our measurement model.

Hypothesis 8 stated that attitudinal tendency to evaluate ideas prematurely predicts intentions through proximal variables. Attitudes toward evaluation significantly and negatively predicted perceived autonomy ( $\beta = -.17, p < .05$ ), which in turn did not significantly predict intentions. Consequently, hypothesis 8 is completely rejected.

Hypothesis 9 stated the effect of promotion focus attitudes toward the use of DT-CT, perceived control and subjective norms. Results show a significant effect of promotion focus on attitude toward the use of DT-CT ( $\beta = .27, p < .001$ ) and perceived capacity ( $\beta = .17, p < .05$ ). Indirect effect of promotion focus on intentions through attitudes toward the use of DT-CT was significant ( $b = .09, 95\% CI [.007, .179]$ ). Thus, hypothesis 9a is supported. Indirect effect of promotion focus on intentions through perceived capacity was also significant ( $b = .06, 95\% CI [.001, .131]$ ), supporting hypothesis 9b for the construct perceived capacity.



Hypothesis 10 could not be tested because the construct of prevention focus was removed from our measurement model.

Finally, hypothesis 11 postulated the effect of organizational climate on intentions through toward the use of DT-CT, perceived control and subjective norms. None of the dimensions of organizational climate had a significant effect on attitudes toward the use of DT-CT and perceived control. Only the organizational support dimension predicted positively descriptive norms ( $\beta = .18, p < .001$ ), which in turn predicted intentions to use DT-CT. However, this indirect effect was not significant according to Monte Carlo estimates ( $b = .06, 95\% CI [-.001, .159]$ ). Consequently, hypothesis 11 is completely rejected.

## Discussion

This study aimed to provide empirical evidence that individual and organizational characteristics affect managers' creative behaviors through a sensemaking process. Basadur (2004) highlighted that leaders apply rarely creative problem solving because they lack familiarity with the two-ministep process of *idea ideation* and *idea evaluation*. Consequently, we investigated the antecedents of managers' adoption of a divergent thinking - convergent thinking process in order to solve problems in their daily activities. First, we assessed their regulatory focus, attitudes toward ideation and evaluation and perception of the organizational climate for creativity and innovation. Then, we made them experience the use of solving managerial problem by applying first divergent thinking then convergent thinking. From there, we assessed their past experiences with the use of this process, their attitudes toward it, their perceived control over the application of divergent and convergent thinking in their activities, and subjective norms. We assessed also the extent to which they formed intentions to solve problem by applying divergent then convergent thinking. Five months later, participants were contacted and asked to report the extent to which they solved problems in their daily activities by diverging then converging on solutions.

The sensemaking process, by which managers evaluate the possibility and the effectiveness of using the DT-CT process in their daily activities was operationalized by relying on the TCP (Fishbein & Ajzen, 2011). We assessed managers' attitudes, perceived capacity, autonomy, injunctive and descriptive norms related to the specific creative action. Results showed that attitudes, perceived capacity and descriptive norms predicted managers' intentions to use DT-CT. Thus, managers form more intentions to apply DT-CT when solving problems in their daily activities when they perceive the interest of DT-CT to solve managerial problems, when

they feel capable of applying DT-CT effectively and when their colleagues are used to adopt similar practices.

Regarding the distal antecedents of managers' use of DT-CT to solve problems in their daily activities, we selected conative variables: regulatory focus and attitudes toward the steps of ideation and evaluation, cognitive variables: managers' fluency and performance in finding creative solutions, and organizational variables: the organizational climate for creativity and innovation. Results show that none of these antecedents had a direct effect on managers' intentions to use DT-CT. Consequently, antecedents that are supposed to be related to creative behaviors do not have the supposed direct influence. Instead, these antecedents help managers to make sense of the situation and the relevance of adopting DT-CT.

Regarding indirect effects of the distal variables on intentions through the sensemaking process, promotion focus, which is a tendency to be motivated by goals and future accomplishments, was found to predict indirectly managers' intentions by increasing their favorable attitudes toward the use of DT-CT and their perceived capacity to use DT-CT. Thus, when managers' behaviors are driven by their need to fulfill their goals, when they work to experience pleasure instead of to avoid difficulties and pain, they perceive more favorably the interest of solving problems by using a creative process, have more insurance in their capacities and consequently report more intentions to apply DT-CT in their daily activities when they encounter problems. At the same time, fluency, which is one of the indices of divergent-thinking performance and which consists of managers' ability to suggest numerous ideas to a given problem, was found to predict managers' perception of their capacity to solve problem in their daily-activities by adopting DT-CT. Thus, managers' fluency skills predict indirectly their intention to apply such skills in their activities by increasing their perception that they are capable of solving problems effectively if they applied DT-CT. The capacity to think rapidly to get numerous solutions appears to be a better predictor of leaders' decisions to use the DT-CT process than their abilities to produce a single creative idea. There are theoretical reasons that can explain such results. Indeed, we stated previously that one restraining factor of leaders' use of creative problem solving was their unfamiliarity and possibly negative attitudes toward divergent thinking (Basadur & Basadur, 2011; Basadur & Gelade, 2002). Moreover, Brophy (1998) stated that people with better divergent thinking skills were more motivated to solve problems creatively, but to our knowledge the psychological process explaining this effect has never been examined before. Thus, our results indicate that the difference between managers who adopt creative behaviors

compared to those adopting routine behaviors arise from their familiarity and performance with divergent rather than convergent thinking.

Surprisingly and in opposition with previous findings (e.g., Basadur et al., 2000), participants' fluency scores did not correlate with creative performance on the convergent thinking test ( $r = .02$ ). This absence of correlation between capacities of ideation and evaluation may suggest that leaders with divergent thinking skills have difficulties selecting the practice that is the most creative. But this suggestion opposes Basadur, Runco and Vega's (2000) statement that people with high divergent thinking skills have more opportunity to exercise convergent thinking skills. Another possibility is that judges did not assess the level of creativity as depending on the level of originality. Indeed, divergent thinking increases the possibility to find more original solutions and we demonstrated in study 3 that judges took mostly into account the level of adaptation in their assessment of managerial creative productions. Moreover, Blair & Mumford (2007) demonstrated that original ideas tend to be rejected by individuals who did not create them but are asked to evaluate them. It is thus possible that leaders with high performance on the divergent-thinking tasks suggested ideas that were more original but that judges did not value such aspects or under evaluated ideas that were highly original.

Finally, only the group factor organizational support of the organizational climate was found to influence descriptive norms, which consequently predicted leaders' intentions. This indirect effect was not significant. However, it demonstrates that organizational support is taken into account by the sensemaking process.

The statistical treatment of the data has some limitations. Structural equation modeling has been highlighted as one of the most relevant analyses to test mediation effects (Cheung & Lau, 2008; MacKinnon et al., 2004). However, it is also associated with limitations. Pearl (2001) highlighted that the use of SEM on cross-sectional data can hardly provide strong evidence of causation. Moreover, SEM limits also the validity of indirect effects estimates because the underlying complete causal model is different from specific indirect models (Danner, Hagemann, & Fiedler, 2015). In the present research, we made every effort to ensure the validity of our findings: causal order of variables were theoretically justified; constructs were assessed in separated times, with antecedent variables assessed first; measurement model validity was demonstrated, and SEM stipulated direct as well as indirect effects of distal variables on intentions simultaneously. Alternatives analyses, such as hierarchical regression analyses could add empirical validity to the present results, but also imply

numerous limitations (e.g., the necessity to analyze the effects of observed variables by creating mean scores of items composing a scale instead of latent constructs). Another limitation concerns the measure of adoption of the DT-CT process. One item and open questions were used to assess the adoption of the DT-CT process and its context, which presents reliability issues. Further research should try to overcome the difficulty of creating several items to measure the behavior adoption following the methodology established by Fishbein and Ajzen (2011) in order to construct a more reliable measure.

Regarding the practical implications of the present results, we suggest that organizations should emphasize the value of seeking original rather than only adaptive ideas. Also, organizations seeking to increase managerial creativity and innovation should focus on the identification and selection of leaders with high promotion focus as it appears to be a stable trait that positively influences managers' sensemaking process leading to creative actions. Moreover building a climate supporting creativity and innovation seems to increase the perception that managers' environment are solving problem creatively and these norms on creative action increase directly leaders' intention to solve problem by diverging then converging in order to find more creative solutions.

Finally, this study sought to stay close to leaders' real settings in order to capture the antecedents of leaders' decision to apply more divergent and convergent thinking when solving problems. The very weak correlation between intentions and adoptions of DT-CT could lead us to suppose that individual or organizational characteristics influence the path from intentions to adoptions of creative problem solving. In order to reflect as close as possible leaders' real problems and reasons to solve them creatively, we asked leaders to find solutions to challenges that were part of their professional goals. However, we know from Runco and Okuda (1988) that presented problems and discovered problems have different levels of intrinsic motivation. Thus, leaders may react differently when they are not asked to solve a specific problem in a creative manner. For example, we cannot insure that leaders will identify problems or opportunities of enhancement that are worth solving creatively and that they will process their decision to adopt the DT-CT process in the same manner as in the present study. In fact, when analyzing the answers of the 45 participants that completed the last part of the study, we found that they used the DT-CT process to a very small extent because they lack of time or of perceived opportunities or problems to solve creatively. Thus, having experienced problem solving through the use of divergent-thinking, convergent-thinking process does not necessarily imply that managers will want or will be able to identify

problems and opportunities that are worth solving with creative and innovative solutions. The next study examines the antecedents and the sensemaking process leading to managers' intention to respond creatively to a problem.

## **Study 5. Problem recognition: Intentions to innovate in a change context**

The impetus for managers' intention to innovate can be found in situations in which managers are confronted with ill-defined problems, threats or opportunities of enhancement in their team or organization. Such situations encourage them to create new and adapted solutions (Birkinshaw et al., 2008; Volberda, Van Den Bosch, & Mihalache, 2014). Among these situations that may potentially result in managerial innovation, Birkinshaw et al. (2008) assert that management creativity and innovation can emerge when managers are confronted with organizational changes. In such situations, managers have the possibility to react with active innovative behaviors or with passive, resistant behaviors (Kunz & Linder, 2013; Volberda et al., 2013). Because the implementation of an organizational change has the potential to trigger different reactions, we seek to investigate which individual differences lead to a greater intention to innovate compared to other reactions.

Ettlie and O'Keefe (1982) recommended studying the emergence of innovative behaviors within specific organizational contexts. Indeed, participants asked about their intention to innovate in a general way may have a strong tendency to respond positively only because they consider that being designated as an innovative manager is socially desirable in organizations (Elder & Johnson, 1989). Thus, contextualizing the request for such an intention may insure that managers will project themselves in a more concrete situation where their choice to either accept or refuse to engage in an innovative process may be justified by the circumstances.

In the present research, we used the implementation of telework as a specific organizational change because it has the potential to impact managerial practices and represents a potential trigger for managers' intention to innovate. The practice of telework has expanded greatly in this last decade. However, in certain European countries, such as France, telework is not yet a standard practice in large companies (Greenworking, 2012; Messenger et al., 2017).

This low progress in the development of telework is partially due to managers' difficulties to adapt their managerial practices (Greenworking, 2012; Lister & Harnish, 2009; Peters & Heusinkveld, 2010). Indeed, telework entails numerous implications for management practices (for a review, see Orengo, Zornoza, & Peiró, 2011). For example, the physical distance between teleworkers and their supervisors requires managers to, at least, adapt their existing behaviors in order to avoid the impoverishment of the relationship with their collaborators (Golden & Veiga, 2008; Wiesenfeld, Raghuram, & Garud, 1999). Moreover, it questions the traditional and inflexible management style that is currently in use in most large organizations (Amado, Faucheux, & Laurent, 1991; Greenworking, 2012; Musa, Brčić, & Hladnik, 2002).

A second explanation for this lack of development of telework is managers' unfavorable opinion on telework (Greenworking, 2012; Lister & Harnish, 2009; Peters & Heusinkveld, 2010). Pérez, Sánchez, and Carnicer (2003) showed that managers' perception of telework entails a large panel of beliefs about its benefits (e.g., increase productivity) and pitfalls (e.g., teleworker isolation). Such beliefs influence managers' attitudes and subsequently their behaviors toward telework. In fact, favorable attitude toward telework and its implications for managerial activity have previously showed a positive effect on innovativeness toward telework (Ellis & Webster, 1998). Thus, telework offers an interesting challenge regarding managers' perceptions of this specific organizational change and their possible intention to innovate (Peters & Heusinkveld, 2010). Therefore, the present research investigates the antecedents of French managers' intention to innovate when they are confronted with an ill-defined or complex situation such as the implementation of telework.

## Proximal antecedents of managers' intention to innovate

The first objective of the present research is to verify that favorable attitudes toward creating innovative behaviors to implement telework and perceived behavioral control on the adoption of innovative behaviors will predict managers' intention to innovate while implementing telework. As mentioned previously, this research contextualizes managerial intention to innovate in a situation of telework implementation. In this specific situation, subjective norms, as defined in the TPB (Fishbein & Ajzen, 2011), seem to be elusive. Indeed, we selected participants who never implemented telework before. Thus, they may have great difficulties picturing what people who are important to them would think if they decided to innovate in their practices in order to implement telework. Subsequently, we excluded

subjective norms from our predictive model. Based on TPB, the present research will test first the following hypothesis:

Hypothesis 1: Attitudes toward innovative behaviors and perceived behavioral control positively predict managers' intention to innovate if they were required to implement telework.

Furthermore, the present study will investigate how these proximal variables constitute a sensemaking process that mediates the effect of specific variables on managers' intention to innovate while implementing telework. Such specific variables will be presented in the next part and referred to as the distal variables.

## Distal antecedents of managers' intention to innovate

When confronted with any organizational change, managers do not always create innovative behaviors. One possibility is that they might not perceive the change as a problem or an opportunity for them to be innovative. Such perception of change refers to attitudes toward change (Oreg, Michel, & By, 2013). More specifically, attitudes toward organizational change relate to the positive or negative beliefs toward a specific change initiative and the emotional perception of change (Piderit, 2000). Attitudes have been studied under different constructs (e.g., Readiness for change, Commitment to change; see Bell, Lee, & Yeung, 2011). For all these variables, research showed direct or indirect effects on individual's intentions and behaviors toward specific changes, and more specifically on how members of the organizations will modify their behaviors in appropriate ways to ensure successful changes (Oreg et al., 2013).

Attitudes toward telework have previously shown a positive direct effect on Information Systems managers' willingness to innovate (Ellis & Webster, 1998). Thus, we postulate that managers who hold positive attitudes toward telework will have more favorable attitudes toward the creation of innovative behaviors in order to implement it; and thus will express greater intention to innovate. Moreover, Michel and González-Morales (2013) noticed that individuals who appraised positively the characteristics of organizational change reported a stronger perception of their capacity to implement and benefit from the change. Thus, attitudes toward telework may enhance also managers' perceived behavioral control over the creation of innovative behaviors in order to implement telework.

Hypothesis 2: Positive attitudes toward telework will predict managers' intention to innovate; but this effect will be mediated by (a) attitudes toward innovative behaviors and (b) perceived behavioral control

Another possible factor encouraging managers to innovate could be found in their attitudes toward the different steps that compose the innovation process. Indeed, managers who decide to address a problem or opportunity through creativity need to engage themselves in a multiple stage process that requires their capacity to use divergent thinking – the generation of multiple ideas without judgment, and convergent thinking – the evaluation and selection of ideas that lead to the newest and seemingly most adapted solution (Birkinshaw et al., 2008).

For Basadur et al. (1982), people in organizations are mostly rewarded for their capabilities to select ideas (the evaluation step of the innovation process) and thus are more familiar with this step. For this reason, they are likely to find it easier than the ideation step (i.e., the generation of new ideas). Thus, one barrier to managers' intentions to innovate might concern this lack of familiarity with this ideation step of the creative and innovative process. Basadur and co-authors (Basadur & Finkneiner, 1985; Basadur & Hausdorf, 1996; Basadur et al., 1999) tackled the perception of ideation by studying attitudes toward ideation and their effect on creative and innovative behaviors. They stated that, “unless the ideation-evaluation process is accepted attitudinally, then the process will not likely occur” (Basadur et al., 2000, p. 81). Thus, managers who are favorable to the ideation step of the innovation process might have more positive attitudes toward innovative behaviors and consequently have a greater intention to innovate.

Hypothesis 3: Positive attitudes toward ideation will predict managers' intention to innovate; but this effect will be mediated by attitudes toward innovative behaviors.

Furthermore, in organizational contexts, several dimensions of the organizational climate showed a consistent influence on individuals' creative and innovative behaviors (Hunter, Bedell, & Mumford, 2005, 2007). Climate refers to employees' perceptions of, or experiences in, their immediate work environment (Mathisen & Einarsen, 2004). The present research focuses on the organizational and supervisory support and encouragement for creativity-related activities<sup>11</sup>. Encouragement for creativity had been identified as one of the principal dimensions of the work environment enhancing creative behaviors and willingness to

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<sup>11</sup> This study took place when the validation of the Organizational Climate for Creativity and Innovation Scale (Massu, Caroff, & Lubart, 2017) was at an intermediate step. Consequently, only the dimension Organizational support was selected for the present research.



innovate in organizations (Amabile, Conti, & Coon, 1996; Scott & Bruce, 1994; Yuan & Woodman, 2010). More precisely, Yuan and Woodman (2010) showed that perceived support for innovation predicted positively individuals' specific attitudes toward the adoption of innovative behaviors (e.g., expected image gains and expected positive performance outcomes), which consequently predicted innovative behaviors.

Moreover, some scholars have also shown that social support on creative behaviors enhanced individuals' self-efficacy and perceived control (Choi, 2004; Mathisen, 2011). Thus, we expect that managers who interpret their environment as supportive for innovative actions will develop positive attitudes toward innovative behaviors as well as a strong perceived behavioral control over innovative behaviors and consequently will report a greater intention to innovate in order to implement telework.

Hypothesis 4: Organizational support will predict managers' intention to innovate; but this effect will be mediated by (a) their attitudes toward ideation and consequently their attitudes toward innovative behaviors and through a second path, by (b) their perceived behavioral control.

In summary, we identified distal variables such as attitudes toward organizational change and toward ideation, and organizational support as potential predictors to managers' intention to innovate while implementing telework. Moreover, we postulate indirect effects of these variables through their respective mediator variables – attitude toward the creation of innovative behaviors and perceived behavioral control.

## Method

### Participants

Participants were French managers from various organizations contacted by email and asked to complete an online questionnaire created on Limesurvey<sup>®</sup>. In all, 117 managers completed the questionnaire. After removing 26 participants who answered that they had already implemented telework in their organization, our final sample was composed of 91 managers (57.1% male) aged from 25 to 64 years ( $M = 43.15$ ;  $SD = 10.05$ ). Their professional experience as managers varied from 6 months to 35 years ( $M = 11.49$ ;  $SD = 9.1$ ) and they supervised between 2 and 270 collaborators ( $M = 21.12$ ;  $SD = 38.37$ ).

## Material and procedure

The first part of the questionnaire concerned demographic questions (sex, age, previous experience in telework, years of managerial experience and number of collaborators actually under their supervision). The second part was composed of items assessing respectively participants' intention to innovate in their managerial practices to implement telework, and the two proximal variables: attitude toward innovative behaviors and perceived behavioral control. The last part of the questionnaire was composed of items assessing the three distal variables: attitude toward telework, attitude toward ideation, and organizational support for creativity and innovation.

For the second part of the questionnaire, all the items were constructed following the methodology proposed by Fishbein and Ajzen (2011; see also Francis et al., 2004) and were adjusted to the behavior under evaluation. In the present research, the behavior is the action to innovate in their managerial practices in response to the hypothetical situation where they were asked to implement telework.

We conducted principal component analyses (PCA) for every scale that were created or adapted from existing ones. For each scale, the number of factors to retain was identified from results of parallel analyses (Horn, 1965). To check the validity of the scales that had been translated into French, we conducted confirmatory factor analyses (CFA).

Managers' *intention to innovate in their managerial practices to implement telework* was measured by three items. A sample item is "Supposing that you are asked to implement telework, would you have the intention to innovate in your managerial practices to do it?" From a PCA analysis ( $KMO = .75$ , Bartlett's test:  $\chi^2(3) = 211.76$ ,  $p < .001$ ), a single factor was identified, explaining 87% of the total variance. Factor loadings ranged between .91 and .95. Consequently, every item was kept for further analyses.

Managers' *attitude toward innovative behaviors* was assessed using six pairs of bipolar adjectives. For example, managers had to rate to what extent modifying their behaviors to implement telework was "useless" to "useful" on a 7-point scale. We conducted a PCA ( $KMO = .85$ , Bartlett's test:  $\chi^2(15) = 274.08$ ,  $p < .001$ ). A single factor was identified, explaining 61% of the total variance. One item had a weak loading on the factor (.50) and was subsequently removed. As every other factor loadings ranged between .69 and .90, all the other items were kept for further analyses.

*Perceived behavioral control* is a construct composed of two facets according to Fishbein and Ajzen (2011): capacity and autonomy. However, the authors stipulate that it is not necessary to distinguish them in construct assessment. Thus, two items were constructed to measure managers' perceived capacity. The correlation between participants' ratings for these two items was significant ( $r = .59$ ;  $p < .001$ ). Two other items measured managers' perceived autonomy. For these two items, participants' ratings also correlated significantly ( $r = .80$ ;  $p < .001$ ). Results from a PCA (KMO = .54, Bartlett's test:  $\chi^2(6) = 141.78$ ,  $p < .001$ ), indicate a two factors solution; they explain respectively 45% and 40% of the total variance. After running a varimax rotation, the two items assessing perceived capacity were principally loading on the first factor and the two items assessing autonomy loaded on the second factor. Factor loadings on their respective factors were comprised between .88 and .96, and loadings on the other factor did not exceed .21. Consequently, perceived behavioral control will be conceived as two different constructs: perceived capacity and autonomy.

The third part of the questionnaire was composed of items assessing the three distal variables from the predictive model.

*Attitude toward organizational change*, which concerns telework implementation, was measured with items constructed following the methodology proposed by Fishbein and Ajzen (2011). We used the same six bipolar adjectives as those measuring attitude toward the creation of innovative behavior. For example, managers had to rate if implementing telework in their teams was, in their opinion, "harmful" or "beneficial" on a 7-point scale. We conducted a PCA (KMO = .87, Bartlett's test:  $\chi^2(15) = 414.28$ ,  $p < .001$ ). A single factor was identified, explaining 71% of the total variance. One item had a weak loading on the factor (.52) and was subsequently removed. The other factor loadings ranged between .87 and .92 and were kept for further analyses.

Two existing scales were translated into French and used to measure the other exogenous variables in the predictive model.

Managers' *attitude toward ideation* was assessed by the subscale *Valuing New Ideas* (18 items) from the *Divergent-Thinking Attitudes questionnaire* (Basadur & Hausdorf, 1996). We conducted a CFA to check if the assessment from the scale was truly unidimensional for the present data. Indices of fit were acceptable only after removing three items<sup>12</sup> and fixing three correlated errors between items ( $\chi^2 = 102.86$ ,  $df = 74$ ,  $p < .05$ ; CFI = .97; NNFI = .96; RMSEA = .06; SRMR = .05).

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<sup>12</sup> Removed items are presented in Appendix 4.3. in italic.

*Organizational support for creativity and innovation* was assessed with 8 items from a questionnaire which had been developed in earlier research (Caroff et al., 2015)<sup>13</sup>. We conducted a PCA (KMO = .93, Bartlett's test:  $\chi^2(28) = 442.99, p < .001$ ). A single factor was identified, explaining 64% of the total variance. Factor loadings varied between .69 and .87. Consequently, every item was kept for further analyses.

For the two last parts of the questionnaire, participants answered all the items on 7-point rating scales. For two of the attitude constructs, attitude toward innovative behaviors and attitude toward telework, the scales presented bipolar adjectives respectively at both ends; for example, "useless" (1) - "useful" (7) or "harmful" (1) - "beneficial" (7). For all other constructs assessed, response scales were presented in a Likert format ranging from 'Totally disagree' (1) to 'Totally agree' (7).

## Results

### Measurement model

We conducted a series of CFA to test the reliability and validity of our measurement model. The first model included every remaining item after the deletion from the PCA and CFA analysis conducted for every scale independently. This model postulated six different latent variables. Results for this first model showed an unacceptable fit with the data ( $\chi^2 = 1136.67$ ,  $df = 719$ ,  $p < .05$ ; CFI = .85; NNFI = .84; RMSEA = .08; SRMR = .08). Based on the suggested modification indices and the standardized expected parameter change (Rosseel, 2012; Whittaker, 2012), we improved the model by removing the two items assessing autonomy, four items from the scale of attitude toward ideation, one item from the scale of attitude toward organizational change and one item from the scale of attitude toward innovative behaviors<sup>14</sup>. We stipulated also one correlated error between two items from the scale of attitude toward ideation. The second version of model shows an acceptable fit with the data ( $\chi^2 = 589.48$ ,  $df = 448$ ,  $p < .05$ ; CFI = .93; NNFI = .92; RMSEA = .06; SRMR = .07). From this final deletion of items, we computed the means, standard deviations and correlations among the variables (see Table 12). To investigate the reliability and validity of the six remaining scales, we estimated the factors loading for each item on their respective

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<sup>13</sup> This study took place when the validation of the Organizational Climate for Creativity and Innovation Scale (Massu, Caroff, & Lubart, 2017) was at an intermediate step. The dimension Organizational support was assessed by 8 items at this time. Two of them were removed during the next steps of the scale validation.

<sup>14</sup> Removed items are presented in Appendix 4.3. in italic

construct, and calculated the average variance extracted (AVE) and composite reliabilities (CR). These coefficients were estimated using a maximum likelihood technique (Fornell & Larcker, 1981). Cronbach's alpha was also calculated for each construct. These estimates are presented in Appendix 4.3, and CR and AVE are reported in Table 12.

We looked first at the standardized coefficients for each item. Two items composing the scales of attitude toward ideation had loadings slightly inferior to .60 (.56 and .59). Other standardized coefficients from items to their factors ranged from .60 to .96. Moreover, each item loaded significantly on its underlying construct ( $p < 0.001$ ).

Second, the composite CR ranged between .75 and .93 and the AVE ranged between .54 and .80. Such estimates are considered acceptable and confirm the convergent validity of our constructs (Fornell & Larcker, 1981; Peng & Lai, 2012). To confirm the discriminant validity between our constructs, we verified that the average variances extracted for each construct are greater than the variance shared between scales. To do so, we compared the square root of average variance extracted of each construct with its correlations with other constructs. As reported in Table 12, every square root of average variance extracted is greater than the correlations between the constructs, providing support for discriminant validity.

*Table 12.* Means, standard deviations, composite reliabilities, average variance extracted, Pearson correlations and Cronbach's alphas

Variable	M	SD	CR	AVE ( $\sqrt{\text{AVE}}$ )	1	2	3	4	5	6
1. Intention	5.36	1.37	.92	.93 (.96)	(.92)					
2. Attitude toward innovative behaviors	4.91	1.31	.85	.59 (.77)	.49**	(.84)				
3. Perceived capacity	4.41	1.55	.79	.66 (.81)	.45**	.26**	(.75)			
4. Attitude toward ideation	5.19	1.04	.92	.54 (.73)	.56**	.35**	.42**	(.92)		
5. Attitude toward telework	4.38	1.56	.93	.76 (.87)	.36**	.50**	.41**	.18	(.93)	
6. Organizational support	4.55	1.19	.92	.60 (.77)	.24*	.22**	.27**	.36**	.10	(.92)

*Note.* \* indicates  $p < .05$ ; \*\* indicates  $p < .01$ . M, SD, CR and AVE are used to represent mean and standard deviation, composite reliabilities and average variance extracted respectively. Values of Cronbach's alphas are presented in diagonal.

## Common method variance

The present data were collected at one time for each participant and through the same questionnaire and thus implies numerous potential sources of common method biases (Common rater effects, Item characteristics effects, Item context effects, Measurement context effects, Podsakoff et al., 2003). We tried to avoid the bias of artifact relationships by

using negative and positive affirmations, and avoid the biases of common scale formats and common scale anchors by balancing Likert scales and semantic differential scales in the same questionnaire. However, further analyses are needed in order to ensure that the different correlations we want to analyze are essentially due to the different constructs under study rather than the method of measurement (Podsakoff, et al., 2003; Podsakoff, et al., 2012).

To control the extent to which common method variance constitutes a problem on the present data, we conducted first a Harman one-factor test on every item that was kept. This factor accounted for 31% of the variance, which is not weak but insufficient to explain the majority of the covariance between the variables. However, Podsakoff et al., (2003) advised to conduct further control for common method bias. Consequently, we conducted also a CFA loading every item on one single factor. Indices of fit demonstrate that such solution does not fit the data ( $\chi^2 = 1598.73$ ,  $df = 464$ ,  $p < .05$ ; CFI = .44; NNFI = .40; RMSEA = .16; SRMR = .17). Moreover, none of the items showed a significant loading on the single factor.

A last verification of the common method bias consisted of conducting a CFA that replicated the second measurement model and partialled out a general factor score. Thus, every item was allowed to load on their respective theoretical latent construct and also on a general latent common method factor. This last model showed also an acceptable fit with our data ( $\chi^2 = 533.90$ ,  $df = 417$ ,  $p < .05$ ; CFI = .94; NNFI = .93; RMSEA = .06; SRMR = .06). However, this last model is less parsimonious and significantly worse than the second measurement model ( $\Delta\chi^2 = 55.58$ ,  $\Delta df = 31$ ,  $p < .01$ ). Moreover, none of the standardized coefficients for each item on their theoretical constructs decreased notably. Therefore, we conclude that the following findings are less likely to be attributed to common method variance.

## Analytic strategy

We used structural equation modeling (SEM) to test the hypotheses deriving from the predictive model of managers' intention to innovate. SEM were conducted using the *lavaan* package (Rosseel, 2012) of R statistical software (R Development Core Team, 2016). As stated in the previous study, the use of SEM allows testing direct and indirect effects of latent constructs instead of composite scores, which reflects more correctly the relations between items and their constructs. Moreover, SEM has been acknowledged as a relevant approach for testing mediation as it helps controlling estimates biases and suppression effects (Cheung & Lau, 2008; MacKinnon et al., 2004).

Parameters of the model were estimated using maximum likelihood (Kline, 1998). Following recommendations by Hu and Bentler (1999), we used several goodness-of-fit indices to evaluate the fit of the different models: the chi-square test, the comparative fit index (CFI, Bentler, 1990), the nonnormed fit index (NNFI, Bentler & Bonett, 1980), the root-mean-square error of approximation (RMSEA), and the standardized-root-mean-square residuals (SRMR, Browne, et al., 1993). Finally, the Monte Carlo method was used to test the statistical significance of the variables' indirect effects (Tofighi & MacKinnon, 2016). These significance tests were generated using the *SemTools* package (Contributors, 2016) of R statistical software (R Development Core Team, 2016).

## Predictive model testing

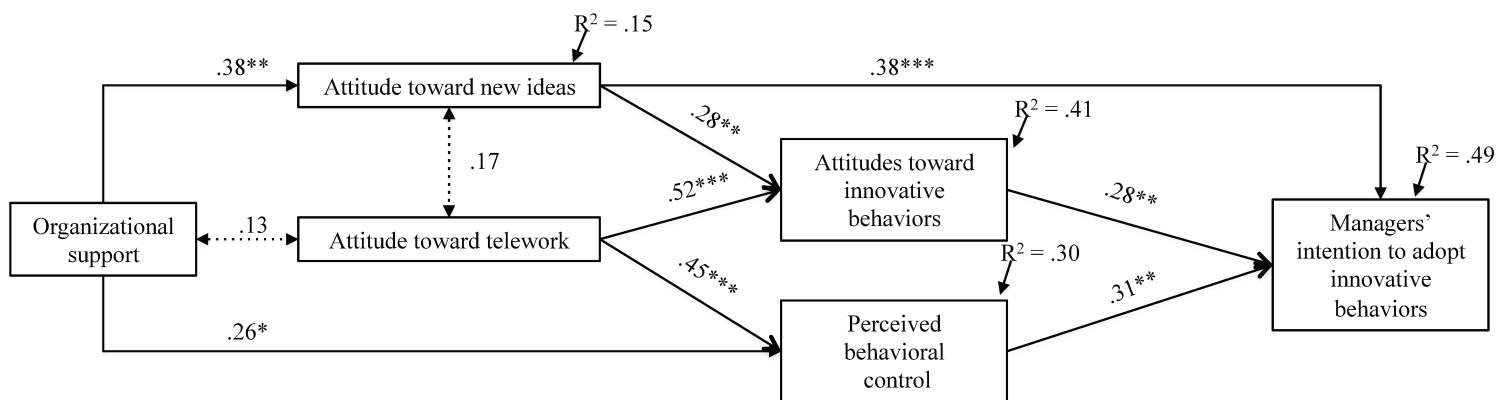
First, the predictive model (model 1) was tested. This model tested every hypothesized indirect effect between the latent constructs and included two correlations between attitude toward telework and respectively organizational support and attitude toward ideation. Results showed an acceptable fit of this model except for the estimate of the standardized-root-mean-square residuals ( $\chi^2 = 619.51$ ,  $df = 454$ ,  $p < .05$ ; CFI = .92; NNFI = .91; RMSEA = .06; SRMR = .10). To improve the fit between our model and data, we considered the suggested modification indices. They suggested that the model could significantly improve by adding a direct effect of attitudes toward ideation on managers' intention to innovate to implement telework. The general assumption that all distal variables are related to managers' intention to innovate only by full mediation effects is therefore rejected.

Consequently, we tested a second model (model 2) that included all parameters presented in the predictive model, the direct effect of attitude toward ideation on intention, and the two correlations between attitude toward telework and respectively organizational support and attitude toward ideation. Indices of fit obtained for this last model were better than for the first predictive model ( $\chi^2 = 606.68$ ,  $df = 453$ ,  $p < .05$ ; CFI = .92; NNFI = .92; RMSEA = .06; SRMR = .08), and the chi-square difference between these two models was significant ( $\Delta\chi^2 = 12.83$ ,  $\Delta df = 1$ ,  $p < .001$ ). Output from this SEM model is presented in Appendix 4.4. The percentages of explained variance for each endogenous variable were acceptable ( $R^2 = .49$  for intention,  $R^2 = .41$  for attitude toward innovative behaviors,  $R^2 = .30$  for perceived behavioral control and  $R^2 = .15$  for attitude toward ideation). Figure 8 presents the results for the postulated effects between the latent variables. To facilitate the comprehension of the results, we only present the structural part of the model in Figure 8.

## Hypotheses testing

Values of estimated parameters allowed testing all hypotheses based on the predictive model. First, results supported hypothesis 1 because managers' intentions were significantly predicted by attitude toward innovative behaviors ( $\beta = .28, p < .01$ ) and perceived behavioral control ( $\beta = .31, p < .01$ ).

Figure 8. Antecedents of managers' intentions to adopt innovative behaviors while implementing telework: Model 2 testing results



Note.  $^{**}p < .01$   $^{***}p < .001$ . Sum of indirect effects:  $\beta = .62$ , 95% CI [.455, 1.349]; Total effect:  $\beta = .99$ , 95% CI [.940, .1,957].

Hypothesis 2 to hypothesis 4 proposed several mediation effects. Table 13 presents a synthesis of statistical results for these mediation effects. The second hypothesis stated a mediated effect of attitude toward telework on intention by the two proximal variables. First, results showed that attitude toward telework predicted significantly attitude toward innovative behaviors ( $\beta = .52, p < .001$ ) and perceived behavioral control ( $\beta = .45, p < .001$ ). The Monte Carlo test revealed that the indirect effects of attitude toward telework on intention to innovate were significant. These results supported hypothesis 2a and 2b.

Hypothesis 3 stated that the positive effect of attitude toward ideation on intention is mediated by attitude toward innovative behaviors. The direct effect of attitude toward ideation on managers' intention was still significant ( $\beta = .38, p < .001$ ) after controlling for the mediator variable. Nevertheless, attitude toward ideation significantly predicted attitude toward innovative behaviors ( $\beta = .28, p < .01$ ), which in turn significantly predicted intention ( $\beta = .28, p < .01$ ). This indirect effect was significant (see Table 13). Results supported



partially hypothesis 3 as attitude toward innovative behaviors partially mediated the effect of attitude toward ideation on intention.

*Table 13.* Indirect pathways from distal variables to managers' intention using Monte Carlo test

Indirect effects	b	95% CI	
		Lower	Upper
<i>Hypothesis 2</i>			
(a) Attitude Twk →AIB →Intention	.21	.051	.393
(b) Attitude Twk→PBC→Intention	.19	.052	.381
<i>Hypothesis 3</i>			
Attitude ideation →AIB→Intention	.10	.015	.221
<i>Hypothesis 4</i>			
(a) Support→ Attitude ideation→AIB→Intention	.04	.005	.103
(b) Support→PBC→Intention	.11	.012	.250

*Note.* Twk = telework, AIB = Attitude toward innovative behaviors, PBC = Perceived behavioral control, Support = Organizational support, b = Unstandardized path coefficients, CI = confidence interval.

Hypothesis 4 stated that organizational support predicted managers' intention through two mediation effects. The first one is composed of two sequential mediating variables: attitude toward ideation and attitude toward the creation of innovative behaviors. Results showed that organizational support predicted significantly attitude toward ideation ( $\beta = .38, p < .01$ ) and that the indirect effect of organizational support on intention through the two sequential mediators was weak but significant. In addition, the second mediation effect implied perceived behavioral control as the mediating variable. As expected, organizational support predicted significantly perceived behavioral control ( $\beta = .26, p < .05$ ). The related indirect effect was significant. Thus, results partially support hypothesis 4a because attitude toward ideation still has a direct effect on intention and support hypothesis 4b.

As the third model includes a direct effect that has not been hypothesized between attitude toward ideation and intention, we tested the unforeseen indirect effect of organizational support on intention via attitude toward ideation (without including attitude toward the creation of innovation behavior). The indirect effect was significant (Indirect effect = .20, 95% CI [.065, .380]). Finally, neither the correlation between attitude toward ideation and

attitude toward telework ( $r = .17$ , *ns*), nor the correlation between organizational support and attitude toward telework ( $r = .13$ , *ns*) were significant.

## Discussion

The present study investigated the effects of individual predispositions and organizational variables on managers' intention to innovate when they are facing a specific organizational change: the implementation of telework. Results supported our main hypotheses, with the exception that the effect of attitude toward ideation had an unexpected direct effect on managers' intention to innovate.

Present results confirm Goepel et al.'s (2012) assumption that the TPB is a relevant theoretical framework for studying intentions to innovate in an organizational context. Confirming Ellis and Webster's (1998) findings, managers' positive attitudes toward telework predict intention to innovate while implementing telework. Moreover, by building on the TPB (Fishbein & Ajzen, 2011), our results provide further explanation regarding the nature of this effect. Indeed, managers' positive attitude toward telework increases respectively their favorable attitude toward innovative behaviors, and their perceived control over innovative behaviors. In turn, these two variables predict intention to innovate.

Organizational support for creativity and innovation shows several indirect positive effects on managers' intention to innovate while implementing telework. These results are in line with the substantial previous researches (e.g., Amabile et al., 1996; Scott & Bruce, 1994). On the one hand, the effect of organizational support is mediated by managers' perceived behavioral control, which corroborates previous findings (Choi, 2004; Mathisen, 2011). On the other hand, this effect is the subject of a double mediation by managers' attitude toward ideation and attitude toward the creation of innovative behaviors in order to implement telework. To our knowledge, no research found previously such effects.

An unexpected result is that, after controlling for attitude toward the creation of innovative behaviors, attitude toward ideation predicted still manager's intention to innovate. Thus, managers can have unfavorable attitudes toward the creation of innovative behaviors in order to implement telework; but for different motives, they report still their intention to innovate. If this interpretation is valid, we may suppose that the motives to innovate may come from their general proclivity toward the generation of new ideas and practices rather than a perceived necessity to innovate in order to implement telework.

Moreover, the absence of correlations between attitude toward telework and respectively organizational support and attitude toward ideation confirm the distinction between the two attitudinal constructs and justify that they were both supposed to affect intention through different paths. Moreover, this result supports the assertion that the practice of telework in itself does not necessarily require creativity, contrary to its implementation (Illegems & Verbeke, 2004).

## Limitations

For theoretical and practical reasons stated above, we chose to focus specifically on managers' intention to innovate rather than their innovative performance or their actual capacity to innovate. However, this decision puts some limits on the interpretation and generalizability of our results for at least two main reasons.

First, intention is the principal but not the unique determinant of the adoption of the subsequent behavior (Fishbein & Ajzen, 2011). Indeed, the extended TPB model (Ajzen, 2012) suggests that perceived behavioral control or previous adoptions of the behavior could have a direct effect on the adoption of the behavior, independently from the subjects' reported intention.

Second, Fishbein and Ajzen (2011) point out that the TPB model applies to a large panel of behaviors, provided these behaviors are volitional. For the purpose of this research, we asked managers to report their intention to innovate in a hypothetical situation that confronted them with the challenge of implementing telework in their team. After controlling that participants were not confronted with implementing telework in their actual organization, their reported intention to innovate seems to result exclusively from their willingness to do so. Nevertheless, we cannot predict that every organization gives managers the autonomy to adopt managerial practices of their own choice, or to create innovative ones.

Although the present results need to be carefully interpreted with regard to such limitations, some avenues for future research can be identified. For example, our study could be replicated with managers who are actually confronted to the implementation of telework in their team. Moreover, a study with a longitudinal design could offer the possibility to assess actual innovative behaviors and their potential specific predictors.

Another important limitation concerns the possibility to generalize the present results to other situations in which managers would intend to engage in innovative behaviors. Indeed, in the present research, we chose to contextualize managers' intention to innovate in a specific

situation of telework implementation for two reasons that we mentioned previously. First, scholars consider telework as a significant departure from traditional working conditions, a challenge to standard managerial practices and thus a situation where managers have the opportunity to create innovative managerial practices (Ellis & Webster, 1998; Felstead, Jewson, & Walters, 2003). This provides a concrete opportunity to test our hypotheses about what determines managers' intention to innovate.

Second, by contextualizing managers' reports on intentions in such a concrete context, we sought to limit the tendency to indicate greater intentions only because it can be socially desirable for some participants to be perceived as innovative managers. If such operationalization was, in our point of view, necessary to capture tangible intentions, it hinders however the possibility to define clearly the extent to which our results are generalizable.

Thus, we expect that future studies could replicate the present research by adapting the current predictors of innovative behaviors in response to different contexts of organizational change. In this way, we would be able to delineate whether we should interpret the present results only regarding the implementation of telework, or if we could generalize them to the implementation of any change or even to managers' intention to innovate regardless of the context.

## Conclusion

The present study clarifies how the organizational climate, individuals' predispositions and organizational change triggering innovation interact to influence managers' intention to innovate. We believe that organizations seeking to motivate their managers' intentions to innovate in the context of telework implementation need to play an active role. First, managers' attitudes toward organizational change seems to depend greatly on the organization's level of communication about the change, as well as the organization's decision to require managers' participation and involvement during the strategic phase of change implementation (Michel & González-Morales, 2013). Second, we noticed that managers showed a greater predisposition toward creativity and consequently stronger intention to respond innovatively to telework implementation when they perceived that their organization and supervisors supported their creativity. Organizations need to act as if change and innovation are part of their culture. They need to convey to managers that they appreciate managerial creative propositions and that they are willing to experiment and implement them

(Kanter, 1983). Another possibility for organizations is to give managers' access to an appropriate training on how to engage the creative process in an organization because such trainings previously demonstrated effects on managers' attitudes toward ideation (Basadur & Finkneiner, 1985; Basadur et al., 1982).

Finally, our results highlight the necessity for managers to feel capable to be creative in order to innovate. The potential lack of perceived capacity may be caused by the fact that technological innovations are generally more valued in organizations than managerial innovations (Birkinshaw et al., 2008). Consequently, managers may not perceive that their organizations expect them to be creative and thus are not used to assert their creative and innovative capacities and do not feel the need to develop them. Organizational and supervisory encouragements are therefore key to creative and innovative behaviors.

## **Chapter 5: General conclusion**

The present chapter aimed to investigate the antecedents of managers' engagement in specific creative actions. Results of the two studies presented in this chapter confirm the assumptions of Ford (1996) and Drazin et al. (1999) that individual and organizational characteristics influence individual creativity through a sensemaking process. Indeed, except for attitudes toward ideation in Study 5, every postulated factor influenced managers' intention to act creatively through their evaluation of the appropriateness and effectiveness of specific creative actions (Study 4) in specific situations (Study 5).

Furthermore, the two present studies confirm the appropriateness of the TPB as a framework to capture how managers interpret individual and organizational characteristics to conclude on the appropriateness of creative actions. The TPB has been previously applied to identify the antecedent and the decision-making process leading to creative behaviors (e.g., Choi, 2012; Cloutier & Leroux, 1998; Goepel et al., 2012; Seligman, 2006). A major interest of the TPB is that it constitutes a framework applicable to different types of specific behaviors. Thus, it enables investigating how individual and organizational characteristics are differently processed according to specific creative actions. For example, further research should investigate how subjective norms have more or less influence on managers' decision to adopt behaviors of idea generation or idea implementation.

In the present studies, we investigated the antecedents of two types of creative behaviors that are perceived as underrepresented in managers' activities: the recognition of a problem that

should be solved creatively and the opportunities to use of divergent and convergent thinking (Basadur, 2004; Basadur & Basadur, 2011). Results such as the strength of the influence of each antecedent cannot be compared across behaviors because they were contextualized with regards to the behavior and assessed by different scales. However, it is worth noting some similarities regarding the different path from antecedents to managers' intentions.

First, the strength of the effect of attitudes toward new ideas on managers' intentions demonstrate the relevance of assessing attitudinal factors to discriminate managers that are more or less willing to act creatively. This effect shows that managers who value the interest of suggesting new ideas in an organizational context have more intentions to act creatively. Consequently, we could infer that managers' desire and motivation to find original solutions are still key elements that spark creative acts regardless of the type of behaviors and the situation. In fact, some managers tend to support most of their collaborators' creative initiatives and would make every activity an opportunity to do things differently. If we had ever interacted with these leaders, we perceived that they would have acted the same way in different organizations and toward different problems. And they may not succeed every time, but they still engage in creative actions. In this sense, these results confirm also the assumption raised by Seligman (2006) that the sensemaking process constitutes a major predictor of organizational behaviors but does not capture every influencing factor. Indeed, leaders with a general predisposition toward openness to experience and new ideas had more intentions to act creatively, regardless of the question of whether or not it was appropriate and effective. One limit of the two studies is that engagement in creative behaviors was only inferred by managers' reported intentions to act in the future or in a hypothetical situation. Even though the effect of intention on the adoption of behavior is not questioned anymore, Fishbein and Ajzen (2011) postulated that perceived behavioral control could affect directly the adoption of specific behaviors. Thus, present results would need to be replicated on managers' actual engagement in creative actions.

Second, it is worth noting that organizational support influenced indirectly managers' engagement in creative behaviors but that this effect took different paths depending on the type of behavior. Overall, organizational support influenced the three factors pertaining to the sensemaking process, mediated by either past experiences or attitudes toward ideation. Thus, organizational support contributes to influence managers' engagement in creative action by increasing their perception that it would be appropriate and effective if they decided to act creatively in their organization.

One interest of the present research is that it focused on managers' intentions to engage in creative actions rather than on their creative performance. In study 4, we postulated that creative performance would actually predict leaders' intentions to act creatively in their organizational environment and on managerial related tasks. But further research could explore the following effect of leaders' intentions on their performance. Choi (2004) demonstrated that student's intentions to express creativity during a class predicted their creative performance, rated by the instructors. However, in a study conducted in 2012 by the same author, this effect was not significant (Choi, 2012). We could postulate that intentions resulting from different sensemaking processes may yield in more or less performance. For example, managers who are more driving by their attitudes toward creativity and who omit to integrate their capacity or the norms in their decision-making process could subsequently show less performance than managers who assimilated control and norms before intending to adopt creative behaviors. Thus, future research could investigate how the sensemaking process impacts differently leaders' engagement in creative actions and creative performance. Moreover, we could postulate that antecedents of the sensemaking process play a new role when intentions are transformed into actions and on the probability of successful implementation of these actions. Demonstrating the influence of individual and organizational characteristics during the different phases on the innovation process, from the sensemaking phase to the successful implementation of new managerial practices, would require a longitudinal design and managers' extensive dedication but could remarkably contribute to enrich scientific knowledge on the antecedents of managerial creativity and innovation.

# Chapter 6: Fit or misfit?

## Introduction

In this chapter, we investigate the joint influence of managers and organizational factors on managers' adoption of innovative behaviors. Managerial creativity requires mostly questioning organizational practices and receiving the necessary support to implement new practices that might impact the structure and climate of the organization. Consequently, we postulate that managers may be affected more than any other actor of the organization by the extent to which they correspond to their work environment on several aspects. The extent to which outcomes are caused by the degree of similarity between an individual and his/her environment is examined under the concept of Person-Environment (PE) fit. The PE fit approach is now considered as a core concept in organizational research (Chatman, 1989; Edwards, 2008; Kristof, 1996). Numerous outcomes of PE fit have been investigated and notably in organizational research such as job satisfaction, organizational commitment, strain and intention to quit (Kristof-Brown et al., 2005). In organizational settings, fit can be apprehended in terms of person-job, person-group or person-organization (Werbel & Gilliland, 1999) and can be regarded in terms of numerous characteristics. As stated in the general introduction, fit can either pertain to a complementary perspective, where individuals have the ability to fulfill organizational demands (demands-abilities fit) or where individuals' needs are fulfilled by organizational supplies (supplies-needs fit), or to a supplementary fit, addressing the degree of similarities between the person and the organization. The two studies presented in this research will respectively address these two last perspectives.

To our knowledge, O'Reilly and Chatman (1986) were among the first to apprehend the effect of fit on extra-role behaviors. They demonstrated that individuals' internalization and identification to organizational values predicted prosocial behaviors. Later, Chatman (1989) postulated that the congruence between individual and organizational values can increase extra-role behaviors but highlighted that extremely high levels of fit could lead to ineffective behaviors such as conformity and reduced innovation. Since, numerous authors examined the link between fit and creativity (see p.65-66 of the present document for a brief presentation of existing research on fit and creativity). Afsar, Badir, and Khan (2015) demonstrated a general



effect of perceived adequacy between an individual and his/her job or his/her organization on innovative behaviors. Other research investigated PO fit in terms of climate (Choi, 2004; Livingstone et al., 1997), problem-solving styles (Puccio et al., 2000) or values (Sarac et al., 2014; Spanjol et al., 2014). Each of these studies demonstrated significant effects of PO fit on creativity or innovative behaviors and highlighted the need to further research in this perspective.

PO fit can be apprehended from an objective or subjective approach. An objective view attempts to diminish the perceptual component in individual responses. To do so, it focuses on tangible characteristics, such as the actual and desired amount of pay, the actual and desired number of days of vacation (e.g., Edwards et al., 1999). In contrast, subjective fit depends on how a person perceives himself/herself and his/her environment. From the beginning, the present research emphasizes an individual approach, focusing on individuals' conceptions of creativity, perception of abilities and environment, and sensemaking process. Consequently, we are primarily interested in applying a subjective approach to investigate how individuals perceive their characteristics and those of their environment and how the adequacy of such perceptions influences their innovative behaviors.

Furthermore, studying the joint influence of managers and organizational factors by applying a PO fit approach enables us to investigate the effects of fit on creativity but also the effects relative to misfit. Indeed, most past research on fit and creativity postulated that congruence effects increased creativity but we can take the analysis further and examine how misfit influences creativity and how such effects differ when the person's characteristics exceed the organization's characteristics or vice versa. In study 6, we investigate how supplies-needs fit on organizational climate for creativity affect managers' innovative behaviors. The main objective of this study is to demonstrate that managers express different levels of needs depending on the type of supplies and that the greater amounts of supplies do not linearly increase creativity as the effect is modulated by managers' needs. From a review of past research, we were able to formulate hypotheses that investigate the effects of fit and misfit in specific directions. To test such hypotheses, we based our methodology on an *atomistic* approach (Edwards, Cable, Williamson, Lambert, & Shipp, 2006). This approach consists of measuring separately individual factors and individuals' perception of environmental factors and then combining these measures to build a PO fit representation (Edwards, 1996; Edwards et al., 2006). This approach is opposed to two other methods used to assess PO fit: a *molecular* approach that consists of asking respondents directly the degree of discrepancy

between them and their organization; and a *molar* approach that assesses directly the perceived match between a person and his/her environment (*ibid.*)

The last study of this research (Study 7) examines how the degree of discrepancy between managers and organizations' values constitute a situation that triggers the adoption of innovative behaviors as a way for managers to adopt adequate practices given their values. This study builds on Chatman's (1989) assumption that value fit may increase conformity and impede innovation. Consequently, we wish to test how value misfit may lead to managers' dissatisfaction with the prescribed practices, which activates their desire to create new practices. Although we did not formulate hypotheses regarding the direction of misfit, we still applied an *atomistic* methodological approach in order to be able to explore how specific directions of misfit affect managers' dissatisfaction and consequently innovative behaviors.

## Study 6. Supply-Need fit

### Introduction

The two previous studies aimed at examining organizational creativity by applying an interactionist perspective and integrating individual predispositions and organizational climate in predictive models of innovative behaviors (Amabile, 1988; Amabile & Gryskiewicz, 1989; Amabile & Pratt, 2016; Anderson et al., 2004; Scott & Bruce, 1994; West, 2002; Woodman et al., 1993). In these studies, and as in most previous research, it was postulated that organizations need to provide as much creativity-related resources as possible for leaders to innovate (e.g., Bunce & West, 1995; Imran, Saeed, & Fatima, 2010; Isaksen & Akkermans, 2011; Scott & Bruce, 1994; Shanker, Bhanugopan, van der Heijden, & Farrell, 2017; Tesluk et al., 1997). However, some previous research suggested that more is not always better. Indeed, Amabile (1998) assumed that resources can either promote or kill creativity, depending on the amount. Taking the example of time, she argued that time pressure on a specific project could increase the perception of a certain challenge and increase intrinsic motivation, leading to boost creativity. However, repetitive tight deadlines increase negative affects toward the organization, stress and decrease motivation. Also, creativity necessitates time for exploration. Thus, time pressure should be well balanced between spending time during idea exploration and minimizing the delay during the implementation phase. Consequently, the optimal level of resources should be considered wisely. For Amabile

(1998), “when it comes to project resources, again managers must make a fit. They must determine the funding, people, and other resources that a team legitimately needs to complete an assignment” (p.82). Following this approach, the next study emphasizes the effect of the confluence between the individual and the environment related to the dimensions of the organizational climate on leaders’ innovative behaviors. More specifically, we examine how the fit between leaders’ needs to be creative and available organizational resources can affect leaders’ innovative behaviors.

## Theoretical framework: a Person-environment fit approach

For the present research, we relied on the conceptual approach of the person-environment (PE) fit. More precisely, the present study adopts a needs-supplies (NS) fit approach that examines situations where individuals have needs to perform or adopt specific behaviors and organizations fulfill more or less these needs by supplying the necessary resources (Edwards, 2007a; Kristof, 1996; Livingstone et al., 1997). More precisely, by relying on a NS fit approach; we wish to examine how the adequacy between leaders’ needs to be creative and organizational supplies predicts leaders’ innovative behaviors.

A needs-supplies fit approach has been previously used to investigate the effect of the adequacy between organizational climate and individuals’ needs on creative and innovative behaviors (Choi, 2004; Livingstone et al., 1997; Livingstone & Nelson, 1994). Choi (2004) examined the effect of NS fit on management students’ creative behaviors during an introductory course. He adapted the Work Environment Inventory (Amabile & Grysiewicz, 1989) in order to assess separately the current and desired climate for creativity in the class. He found that creative behaviors increased when the current climate in class approached the students’ desired climate, but students’ innovative behaviors started to decline when the current climate exceeded the desired climate. He noticed also that creative behaviors were higher when both current and desired climates were high than when they were low. Livingstone, Nelson, and Barr (1997) examined the effects of NS fit regarding the creative climate on employees’ strain, job satisfaction, commitment and performance. They used an experimental design similar to Choi (2004). They found that strain and job satisfaction were predicted primarily by organizational supplies. Even though these two studies contribute significantly to understand better the effects of NS fit on creative behaviors, three limitations should be addressed.

First, none of these studies focused on managers and their organizations. However, several arguments highlight the need to distinguish the effect of climate on managers and non-managers' creativity. Indeed, previous research demonstrated that managers hold different and more positive perceptions regarding the creative climate than non-managers (Kwasniewska & Necka, 2004). Such difference can be due to the fact that managers both perceive and influence the organizational climate for creativity (Ekvall, 1996) and that they have access to more resources than non-managers (Kwasniewska & Necka, 2004). Moreover, management innovation may not require the same resources as technological innovation. For example, managers may need more autonomy to experiment their ideas than engineers whose jobs consist of creating new products as being part of a team. Thus, managers may express different needs to be creative than non-managers (Kwasniewska & Necka, 2004).

Second, though Livingstone, Nelson, and Barr (1997) suggested exploring the fit on specific environmental conditions, both existing studies on SN fit (Choi, 2004; Livingstone et al., 1997) examined fit from a general conception of creative climate and, for that reason, used unidimensional constructs to assess SN fit, even though organizational climate for creativity has been extensively studied as a multidimensional concept (e.g., Amabile et al., 1996; Ekvall, 1996; Hunter et al., 2005, 2007; West, 1990). Therefore, it is necessary to investigate how SN fit could differ for the different dimensions of the creative climate and, if it is the case, how these different kinds of fits could affect innovative behaviors. Moreover, there are reasons to believe that leaders may have different needs regarding the resources to be creative. For example, the dimension *Mission clarity*, which refers to the awareness of goals and expectations, is mostly perceived as an enhancing factor of innovative behaviors (e.g., Hunter et al., 2005, 2007; Thamhain, 2003). Nevertheless, some research showed that situations of uncertainty can stimulate organizational creativity (Pierce & Delbecq, 1977) or innovation (West, 2002). Thus, we believe that individual differences exist regarding the needs for mission clarity. Depending on individuals and situations characteristics, managers may prefer to have a certain degree of unpredictability in their job in order to be creative. Similarly, positive interpersonal relationships have been found to predict positively innovative behaviors (e.g., Bunce & West, 1995; Choi, 2012; Farmer, Tierney, & Kung-mcintyre, 2003; Hunter et al., 2005, 2007; Madjar, Oldham, & Pratt, 2002). However, creative people are mostly characterized as individualistic (Amabile, 1988; Gough, 1979; Joy, 2004; Sternberg, 1985). Thus, we could imagine that leaders with a high level of individualism do not place the same emphasis on the need for positive interpersonal relationships to be creative than leaders with lower individualism. In addition, the level of

adequacy between supplies and needs regarding the *Interpersonal positive relationships* dimension could differently influence innovative behaviors as a function of their level of individualism. Hence, the present study aims at investigating the effects of SN fit for each specific dimension of organizational climate on leaders' innovative behaviors.

Third, previous studies sought to establish the link between SN fit and creativity but only one attempted to identify the process relating the adequacy of supplies and needs to innovative behaviors. Afsar, Badir, and Khan (2015) studied the effect of person-organization fit on innovative behaviors. Three items asking the extent to which individual and organizational values matched operationalized PO fit. The authors demonstrated that the effect of PO fit on innovative behaviors was mediated by individuals' perception of trust regarding the support they can receive from their colleagues when suggesting new ideas. Aside from this research, every study postulated a direct link between the fit on individual and organizational characteristics and creative outcomes. Having the necessary resources to be creative can be seen as a necessary but not sufficient condition to increase leaders' adoption of innovative behaviors. Consequently, the process through which SN fit leads to innovative behaviors is worth investigating. Livingstone, Nelson, and Barr (1997) stated that organizational factors influence innovative behaviors while producing cognitive (e.g., performance) and non-cognitive (e.g., commitment) characteristics to the situation. They tested further the effect of a fit between supplies and needs for creativity on strain, job satisfaction, commitment and job performance, but they did not attempt to explain how they were part of the mechanism by which NS fit influenced innovative behaviors.

The present study extends previous research on SN fit and creativity by addressing three issues: (a) it focuses on leaders, (b) it investigates the fit for different dimensions that constitute the organizational climate for creativity, and (c) it examines for four potential explanations of how fit influences leaders' innovative behaviors.

## Theory development and hypotheses

### Direct effects of SN fit on innovative behaviors

As stated previously, from the taxonomy proposed by Hunter, Bedell, & Mumford (2005, 2007), we developed a model for organizational creative climate (Caroff et al., 2016; Massu et al., 2017). This model is composed of a general factor that represents broadly a favorable atmosphere in the organization toward creativity and innovation, and four group factors that depict more specific aspects of the environment that are supposed to facilitate the emergence

of innovative behaviors: Organizational and supervisory support for creativity, Positive interpersonal relationships, Challenge and autonomy, and Mission clarity. In the next section we will present the hypotheses we made regarding the effect of fit for the general factor and each group factor. For each dimension, hypotheses will focus first on situations of congruence: When needs (N) and supplies (S) are at similar levels ( $N = S$ ), and second on the effects of situations of incongruence: When needs exceed supplies ( $N > S$ ) or supplies exceed needs ( $N < S$ ).

#### *Organizational climate*

The general factor reflects an environment conducive to creativity in the organization. Following the findings of Choi (2004) and Livingstone, Nelson, and Barr (1997), we postulate that managers will report more innovative behaviors as organizational supplies increase and are congruent with their needs. Thus, when supplies and needs fit, there is a linear relationship between SN fit and innovative behaviors.

Hypothesis 1.a: The more needs and supplies on organizational climate for creativity are both high and congruent, the more leaders will adopt innovative behaviors.

Situations where organizational supplies for the general factor do not fit managers' needs entail two types: when supplies exceed needs and when needs exceed supplies. Leaders who evolve in an environment supporting creativity more than they need should still be motivated to adopt innovative behaviors. Whereas, when leaders' needs for a supportive organizational climate exceed their actual organizational climate, it might hinder their engagement in innovative behaviors.

Hypothesis 1.b: For the general factor of organizational climate, innovative behaviors do not decrease when supplies exceed needs but they decrease when needs exceed supplies.

#### *Organizational support*

Organizational support reflects the encouragement, resources, recognition and rewards that the organization can provide to develop creativity and innovation. Effects of organizational support on creative performance and innovative behaviors have been studied extensively and show a stable positive effect (see Anderson et al., 2014 for a review). Similar to hypothesis 1.a and 1.b, we assume that when leaders' needs and organization' supplies are high and

congruent; leaders are in an optimal situation to adopt innovative behaviors. Nevertheless, innovative behaviors decrease when leaders' needs exceed supplies.

Hypothesis 2.a: The more needs and supplies on organizational support are both high and congruent, the more leaders will adopt innovative behaviors.

Hypothesis 2.b: Innovative behaviors do not decrease when supplies on organizational support exceed needs but decrease when needs exceed supplies.

#### *Positive interpersonal relationships*

Positive interpersonal relationships reflect the cohesion, intellectual stimulation, transparent communication and absence of conflicts among colleagues and teams. Leaders who express high needs for positive interpersonal relationships to be creative and who work with a cohesive and harmonious environment might perceive that their colleagues are more sympathetic to their creative initiatives, and thus might be more inclined to suggest and experiment new managerial practices. Thus, we hypothesize a linear relationship between SN fit for positive interpersonal relationships and innovative behaviors.

Hypothesis 3.a: The more needs and supplies on interpersonal relationships are both high and congruent, the more leaders will adopt innovative behaviors.

However, developing the cohesion and the communication of the team is part of leaders' activities (Yukl, 1989). Organizational climate and support are dimensions that managers experience but they have few opportunities to readjust. In contrast, positive interpersonal relationships is a dimension that managers can act upon, for example by suggesting and experimenting team building practices. Thus, a lack of positive interpersonal relationships among leaders' teams could constitute a problem that is worth solving by expressing creativity. Indeed, Caroff and Lubart (2012) noticed that managing conflict and team building were the managerial activities that explained most variance in managers' expression of creativity. Thus, leaders expressing needs toward positive interpersonal relationships to be creative may seek new solutions and practices in order to improve their current team situation. Consequently, regardless the level of supplies, managers can act creatively because they have more positive interpersonal relationships than they need - so their needs are fulfilled - or because they seek to improve the current the relationships with their team and supervisors.

Hypothesis 3.b: Leaders' with high needs for interpersonal positive relationships adopt innovative behaviors regardless the level of supplies.

### *Challenge & autonomy*

The dimension Challenge & autonomy refers to leaders' perception that their job and tasks are interesting, complex and challenging, and that they have the necessary freedom to perform them in the way they want. Regarding these aspects, the current level of challenge and autonomy on the task affects leaders, but they have also the possibility to craft their job by creating new practices and setting new objectives in order to improve these levels of challenge and autonomy. Thus, similar to the hypotheses assumed for the Positive interpersonal relationship dimension, we expect that a congruency between leaders' needs and organizational supplies regarding challenge and autonomy will increase leaders' innovative behaviors. However, when leaders express high needs for challenge and autonomy, a lack of current supply may constitute a possibility of enhancement toward which leaders will respond by adopting innovative behaviors.

Hypothesis 4.a: The more needs and supplies for challenge and autonomy are high and congruent, the more leaders will adopt innovative behaviors.

Hypothesis 4.b: Leaders' with high needs for challenge and autonomy adopt innovative behaviors regardless the level of supplies.

### *Mission clarity*

Mission clarity refers to the perception that the organization and the individual have a clear vision on their role, precise objectives but also explicit procedures to achieve these objectives. On this particular dimension, individual differences may lead to preferences for either clear or unclear instructions on the job in order to be creative. When a clear vision is set, leaders might perceive that they have the necessary context to create new practices that are adapted to this vision. However, when procedures to achieve objectives are too definite, leaders may not find opportunities to create innovative practices. Thus, we postulate that SN fit for mission clarity and innovative behaviors do not have a linear relationship.

Hypothesis 5.a: A congruence between needs and supplies on mission clarity (either high or low) is related to innovative behaviors.

Moreover, similar to the previous dimensions, leaders who need higher clarity than the actual supplies may express creativity to change the current situation. In the opposite situation, when leaders need uncertainty and imprecision to be creative but their organizations assigned very specific and clear procedures to achieve their objectives, they will not experience the necessary freedom to express creativity.



Hypothesis 5.b: Innovative behaviors is not lower when needs exceed supplies on mission clarity but is lower when supplies exceed needs.

#### Indirect effects of NS fit to innovative behaviors

As demonstrated by Livingstone et al. (1997), congruence between needs and supplies for organizational climate influences several outcomes that such as job satisfaction and commitment. We postulate that these variables reflect the process through which NS fit might predict managers' engagement in innovative behaviors. To what extent could this process be regarded as sensemaking? In the sense of Ford (1996) and Drazin et al. (1999), job satisfaction of organizational commitment could be perceived as antecedents rather than components of the sensemaking process of creativity. However, Harris (1994) postulated that affective commitment toward the organizational reflected a form of attachment that resulted from an agreement between the self and others in organizations, and that this attachment could make proactive behaviors relevant for the individual. For Weick (1995), commitment is part of the sensemaking process as it entailed motivational consequences. He stated "What is distinctive about commitment is that it highlights the importance of action, visibility, volition, and irrevocability in the formation and persistence of meanings" (Weick, 1995, p.162). In this sense, positive appreciations of the job or the organization are factors that can lead to individuals' positive appraisals of innovative behaviors in order to contribute to improve the job or the organization. Consequently, we wish to test the effects of several factors as part of the sensemaking process that might improve the relevance of innovative behaviors in different situations of fit.

#### *Job satisfaction*

Job satisfaction has been identified as the principal outcome of the global congruence between a person and his/her professional environment (Kristof-Brown et al., 2005). When organizations provide supplies that fulfill individuals' needs, employees report more satisfaction toward their jobs and organizations (Cable & Edwards, 2004; Edwards & Cable, 2009; Edwards, Caplan, & Harrison, 1998). The same effects have been found in studies that examine the PE fit about creativity (Choi, 2004; Livingstone & Nelson, 1994; Spanjol et al., 2014). Previously, Livingstone, Nelson and Barr (1997) showed that the more organizations provided resources for creativity, the greater was job satisfaction. The level of satisfaction was highest when the needs of the individual and the resources were high and congruent. In another study, Spanjol, Tam and Tam (2014) explored the effect of adequacy or inadequacy

between individual and organizational values for environmental issues. They assumed that an organizational climate supporting creativity increases the creativity of employees (Shalley et al., 2004) and that this climate of support predicts job satisfaction (Podsakoff, MacKenzie, & Bommer, 1996). Their results show a partial mediation of PE fit effects on creative behavior through job satisfaction. Following the conclusion from these studies, we hypothesize that the more individuals have resources at their disposal that meet their needs, the more they will express satisfaction and thereby the more creative behaviors they will adopt. Nevertheless, several authors postulated an inverse effect of job satisfaction on creativity. For example, Goepel, Hölzle, and zu Knyphausen-Aufseß (2012) proposed that dissatisfaction with the status quo predicts positive attitudes towards innovation and consequently a higher propensity to adopt innovative behaviors. Similarly, George and Zhou (2001) have shown that when individuals are dissatisfied with their job but feel committed to their organization, they report more creative behaviors. Consequently, we can assume the alternative hypothesis regarding the effect of job satisfaction on creative behaviors. Thus, we postulate that SN fit predicts positively job satisfaction but we cannot statute on whether job satisfaction increases or decreases innovative behaviors.

Hypothesis 6: SN fit is related to leaders' job satisfaction that consequently influences (positively or negatively) their adoption of innovative behaviors.

#### *Organizational affective commitment*

Organizational commitment is defined as the identification and involvement of an individual toward his/her organization (Mowday, Steers, & Porter, 1979). According to Meyer and Allen (1991), commitment can be of three different natures. *Normative commitment* reflects a sense of the obligation to remain in the organization. *Continuance commitment* concerns the awareness of the cost associated with the decision to leave the organization. *Affective commitment* reflects individuals' emotional attachment to the organization. A meta-analysis conducted by Kristof-Brown et al. (2005) revealed that organizational commitment was amongst the principal outcomes of PE fit (e.g., Choi & Price, 2005; Edwards, 2007a; Livingstone et al., 1997). Meyer and Allen (1991) suggested that affective commitment emerged when individuals perceived that their needs were fulfilled by their work experiences. Thus, leaders who perceive that their needs regarding the organizational climate for creativity are fulfilled should experience more affective commitment. Furthermore, affective commitment has been identified as the type of commitment that has a stronger influence than the two other components on individuals' performance and well-being (Meyer & Maltin,

2010). Previous research demonstrated also the positive influence of organizational commitment on creativity and innovation (e.g., Hou, Gao, Wang, Li, & Yu, 2011; Madjar et al., 2011) and more specifically affective commitment (Ng, Feldman, & Lam, 2010).

Hypothesis 7: SN fit is related to leaders' affective commitment that consequently influences their adoption of innovative behaviors.

Job satisfaction and organizational commitment have been extensively studied together as predictors or outcomes. Every possible causal relationship between the two variables has been postulated. Currivan (1999) tested four possible relationships between job satisfaction and organizational commitment. His results supported the absence of causal relationships but highlighted the necessity to control the covariance between the two variables. Thus, the present theoretical model does not test any causal relationship between job satisfaction and organizational commitment but will examine only the correlation between both.

#### *Creative self-efficacy*

Organizations that provide support for individuals' creativity influence how the individuals perceive themselves as able to perform creatively (Tierney & Farmer, 2002). Such "belief that one has the ability to produce creative outcomes" refers to the construct of creative self-efficacy (Tierney & Farmer, 2002, p. 1138). Employees' creative self-efficacy has been identified as a predictor of creative performance and innovative behaviors (Puente-Díaz, 2015; Tierney & Farmer, 2002, 2011) and a mediator between organizational factors and creative performance (Shin & Zhou, 2007). Moreover, Yu and Davis (2016) recently demonstrated the effect of SN fit for organizational values on job self-efficacy. Regarding more specifically SN fit and creative self-efficacy, Choi (2004) postulated that immediate psychological predictors of creativity, such as creative self-efficacy, might mediate the effects of fit on creative behaviors. However, to our knowledge the author did not test such hypothesis. Thus, the adequacy between leaders' needs to be creative and organizational supplies should increase leaders' creative self-efficacy, which leads consequently to higher innovative behaviors.

Hypothesis 8: SN fit is related to leaders' creative self-efficacy that consequently influences their innovative behaviors.

#### *Risk-taking*

As stated previously, adopting innovative behaviors requires that leaders are willing to take risks. Dewett (2006) noticed that the effect of organizational support on creative behaviors

was mediated by individuals' willingness to take risks. Moreover, willingness to take risks increases when individuals have a high self-efficacy (Dewett, 2007; Krueger & Dickson, 1994) but, to our knowledge, this effect has not been tested with the construct of creative self-efficacy. Regarding managerial settings, García-Granero, Llopis, Fernández-Mesa and Alegre (2015) noticed that managers' propensity to take risks in their activities had a direct effect on the firm's innovation performance. Thus, we assume that when leaders perceive that organizational climate provides the necessary resources to fulfill their needs to be creative, they will be more willing to take risks in the managerial activities and consequently will adopt more innovative behaviors. Moreover, we assume that leaders in a SN-fit situation have higher creative-self efficacy and consequently feel more capable of handling the potential negative consequences of managerial risky behaviors.

Hypothesis 9: SN fit is related to leaders' risk-taking in their activities that influences consequently their innovative behaviors.

Hypothesis 10: The effect of SN fit on leaders' risk-taking in their activities is mediated by leaders' creative self-efficacy.

Finally, we postulate that the adequacy between supplies and needs in order to be creative will have a greater influence when leaders are familiar with managerial creativity. Following Tierney and Farmer (2011), we identify that creative role identity and organizational expectations toward creativity could reflect leaders' familiarity with managerial creativity. Creative role identity refers to the importance that leaders placed on creativity to their self-description and identity at work (Farmer et al., 2003; Karwowski, 2014; Tierney & Farmer, 2011). Creative role identity was found to increase individuals' creative self-efficacy (Farmer et al., 2003; Tierney & Farmer, 2011). According to Petkus (1996), creative role identity leads individuals to prioritize activities that are related to creativity and consequently to a greater involvement in creativity engagement. Thus, creative role identity leads individuals to emphasize organizational and job aspects that are related to creativity. Consequently, we postulate that for leaders who have a strong creative role identity, the adequacy between their needs and supplies to be creative have a stronger effect on their job satisfaction, affective commitment, creative self-efficacy and innovative behaviors.

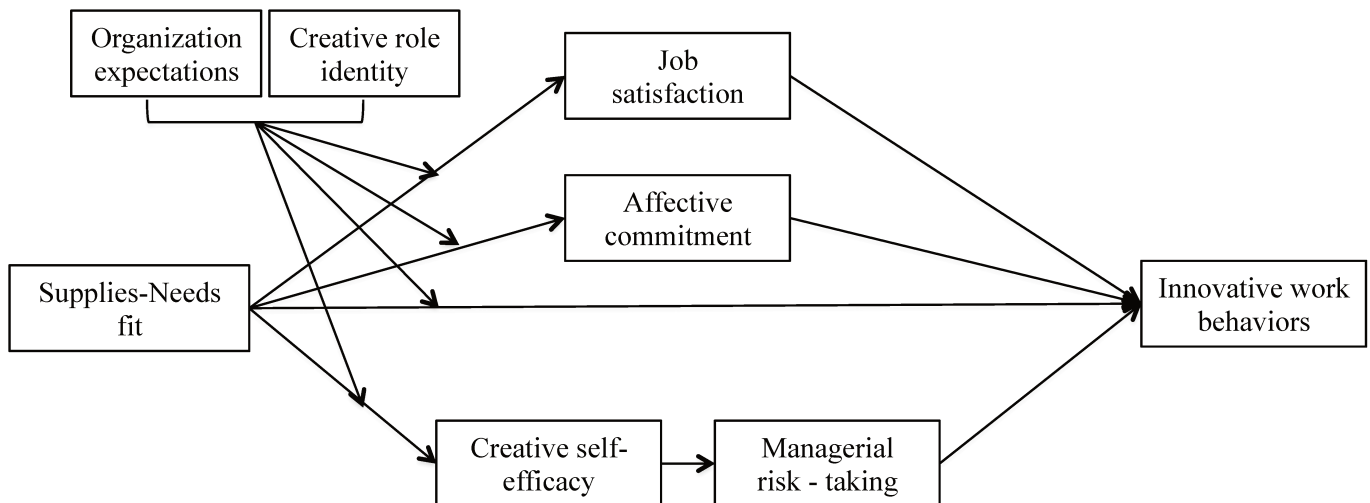
Hypothesis 11: Creative role identity moderates the effect of SN fit on job satisfaction, organizational commitment, creative self-efficacy, managerial risk-taking and innovative behaviors.

Similarly, previous studies demonstrated that organizational creativity expectations influenced creative self-efficacy (Tierney & Farmer, 2004), creative involvement (Carmeli & Schaubroeck, 2007), creative performance (Gilson & Shalley, 2004; Shalley, 1991) and innovative behaviors (Scott & Bruce, 1994; Yuan & Woodman, 2010). Unsworth, Wall and Carter (2005) noticed the lack of research on organizational requirement for creativity and demonstrated the direct effect of this variable on employee creativity, and that creativity requirement accounted for much of the variance in the relationship between traditional work factors and creativity. However, creative expectations should necessarily be accompanied by support, resources and feedback, otherwise, it deteriorates job satisfaction and can decrease long term creativity (Gilson & Shalley, 2004; Shalley et al., 2009). To go further, we postulate that leaders' satisfaction, commitment, self-efficacy and creativity will be more influenced by the adequacy of supplies and needs when their organization expected them to be creative. For example, we could easily envision that a manager who perceives that he/she is lacking the necessary resources to be creative will be less satisfied or committed toward his/her organization if he/she is expected to act creatively rather than if he/she is not.

Hypothesis 12: Organizational creativity expectations moderate the effect of SN fit on job satisfaction, organizational commitment, creative self-efficacy and innovative behaviors.

The present study will test the theoretical model presented in Figure 9. This model will be tested separately for each dimension of the organizational climate for creativity. It incorporates four explanatory variables. Two variables are general potential outcomes of a fit between leaders' needs and organizational supplies: Job satisfaction and Affective commitment. The two others are more specific to leaders' creativity: Creative self-efficacy and Managerial risk-taking. Moreover, we postulate that creative role identity and organizational creativity expectations will moderate the effects of NS on the mediating and dependent variables. These mediating and moderating variables have been selected after a review of the literature regarding effects of NS fit and antecedents of innovative behaviors. Empirical foundations of our mediation and moderation hypotheses will be presented shortly later. The following assumptions apply to each dimensions of the organizational climate.

Figure 9. Theoretical model explaining the effects of Needs-Supplies fit



## Method

### Participants

In order to test the hypotheses and the overall predictive model, we created an online questionnaire on Limesurvey<sup>®</sup> aiming to assess the different constructs and collect sociodemographic data for the participants. French managers completed the questionnaire between May and October 2016. Respondents were principally working in the industrial sector (around 80%). They were contacted on their professional email addresses and invited to click on a link to complete the questionnaire. We posted also the link on an intern platform of one company where managers participated in a massive open online course (MOOC) on management. The message accompanying the link stipulated that the anonymity of the respondents and the confidentiality of their answers would be strictly respected. Three hundred and ten managers accessed the questionnaire, among which 191 completed it (62% of completion). Demographic characteristics for the final sample of 191 managers are presented in Table 14.

Table 14. Descriptive statistics [Mean  $\pm$  SD or N(%)] for the final sample

Variable	Participants (N = 191)
Sex (Male)	140 (73.3)
Age (years)	42.5 $\pm$ 9.4
Position:	
Line manager	105 (55)
Project manager	46 (24.1)
Senior manager	40 (21)
Professional experience (years)	19.1 $\pm$ 9.6
Managerial experience (years)	10.15 $\pm$ 8.57
Number of collaborators	21 $\pm$ 64.5

## Measures

### Needs-Supplies fit

The procedure applies an atomistic approach (Edwards et al., 2006) and consists of asking participants to rate separately their needs and the supplies they perceive from their environment. This indirect measurement approach to PE fit requires that measures of needs and supplies are commensurate for the dimensions under study and items that compose the assessment tools (Edwards et al., 1998). Thus we planned to create two commensurate measures in order to assess respectively individual needs toward the organizational climate and organizational supplies.

*Organizational supplies.* To assess the extent to which organizations provided resources to develop leaders' creativity, we used the Organizational Climate for Creativity and Innovation Scale (OCCIS: Caroff et al., 2016, 2015; Massu et al., 2017) that we presented previously and used in Study 4. The scale assesses a bi-factorial model composed of a general factor loading all the items, and four group factors (Encouragement and organizational support, Positive interpersonal relations, Autonomy and challenge, and Mission clarity). The questionnaire is composed of 24 items that allow assessing a bi-factorial model of creative climate. This kind of model allows the separation between the high-order and first-order factors, facilitating their independent interpretations. The present model is composed of five uncorrelated factors: a general factor loading all the items, and four group factors (Encouragement and organizational support, Positive interpersonal relations, Autonomy and challenge, and Mission clarity). Instructions presented to participants were the following: "We will present

you proposals on several aspects of the working environment. Please indicate to what extent these proposals correspond to your perception of your work environment". To answer, participants used Likert scales ranging from 1 for "Not at all" to 7 for "Extremely". A sample item for the dimension Mission clarity is "The instructions given by my managers are always clear." A sample item for the dimension Challenge is "My work is stimulating". A confirmatory factorial analysis showed that the bifactorial model fit the data for the present study at an acceptable level ( $\chi^2 = 381.81$ ,  $df = 221$ ,  $p < .05$ ; CFI = .94; NNFI = .92; RMSEA = .06; SRMR = .06).

*Individual needs.* This second dimension of the fit refers to leaders' assessment of the extent to which they need specific psychological and practical resources in order to be creative and innovative in their work. We are aware that creativity and innovation may require different resources, but due to the fact that these two aspects cannot be studied separately in the context of this research, a global approach will be adopted, which will involve questioning the participants about the resources they need to be both creative and innovative. To encompass the general needs across the different phases of the innovation process, we asked leaders about their needs to be creative and innovative. We presented the OCCIS (Caroff et al., 2016, 2015; Massu et al., 2017) a second time to participants but with different instructions: "To answer this part of the questionnaire, *you should not consider your current position but your personal needs to be creative and innovative*<sup>15</sup>, whatever your working environment is. For each aspect, please indicate to what extent you need it to be creative or innovative at work". Participants used Likert rating scales ranging from 1 for 'Not at all' to 7 for 'Extremely'. The commensurate items with the ones presented above for organizational supplies is "To be creative and innovative, I need that the instructions given by my managers are always clear", and "To be creative and innovative, I need to be stimulated by my work". We conducted a confirmatory factor analysis to confirm the structure of the measure of organizational needs. Unfortunately, based on Hu and Bentler's (1999) criteria, the bi-factor structure tested by a confirmatory factorial analysis did not fit the data at an acceptable level when items were adapted to assess individual needs ( $\chi^2 = 467.09$ ,  $df = 221$ ,  $p < .05$ ; CFI = .91; NNFI = .88; RMSEA = .08; SRMR = .07).

As we needed the two scales similarly composed and structured (i.e., composed of items loading strictly on the same dimensions whether they assess needs or supplies), we decided to remove from both scales items that had low loadings on their postulated dimensions. We

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<sup>15</sup> Italic added



ensured that items were removed on both needs and supplies scales. The final scales respectively assess a bifactorial model and are composed of 13 items (3 items assessing organizational support, 4 assessing Positive interpersonal relationships, 3 assessing Challenge & Autonomy, and 3 assessing Mission clarity). In the dimension Challenge & Autonomy, the three removed items assessed the original facet autonomy. Thus, the dimension now refers exclusively to Challenge, as defined by Hunter, Bedell, and Mumford (2005). Fit indices showed that the shorter versions of the scales fit the data in the present study (for Organizational supplies:  $\chi^2 = 64.02$ ,  $df = 53$ ,  $p > .05$ ; CFI = .99; NNFI = .99; RMSEA = .03; SRMR = .04; and for Individual needs:  $\chi^2 = 89.86$ ,  $df = 53$ ,  $p > .05$ ; CFI = .96; NNFI = .95; RMSEA = .06; SRMR = .05). Participants' scores were the computed estimated values for the latent variables in the model using the function *lavPredict* in the *lavaan* package. Because of the way these scores are computed, they are mean-centered which hinders the possibility to present the descriptive means in Table 15.

## Outcomes

*Job satisfaction.* This concept was measured using Brayfield and Rothe's (1951) six-item scale and Fricko and Beehr's (1992) two-item scale. By aggregating these two scales, we have 8 items that measure not only the emotional aspects of job satisfaction, but also a component representing the intentions to stay in the satisfying job. A sample item composing the scale is "I like my job better than the average person". A PCA (KMO = .86, Bartlett's test:  $\chi^2(28) = 619.63$ ,  $p < .001$ ), with parallel analysis (Horn, 1965) indicates one dimension (50% variance explained) to retain for the 8 items. A CFA confirmed the unidimensional structure of the scale ( $\chi^2 = 22.12$ ,  $df = 15$ ,  $p > .05$ ; CFI = .99; NNFI = .98; RMSEA = .05; SRMR = .04).

*Affective commitment.* This concept was measured using Allen and Meyer's (1990) eight-item scale. A sample item is "I would be very happy to spend the rest of my career with this organization". A confirmatory factor analyses confirmed the unidimensionality of the scale ( $\chi^2 = 23.8$ ,  $df = 19$ ,  $p > .05$ ; CFI = .99; NNFI = .99; RMSEA = .04; SRMR = .04).

*Creative self-efficacy.* Six items measured this concept. Three items are borrowed from Tierney and Farmer's (2002) scale, and we decided to create three new items in order to assess creative self-efficacy for the different stages of the innovation process. Therefore, the six aggregated items cover the four stages of the innovation process (Dorenbosch et al., 2005): problem identification, idea generation, idea promotion and idea implementation. The

contents of the six items were revised to address a population of managers. A sample item created to assess creative self-efficacy related to the stage of idea promotion is “I trust my ability to mobilize my colleagues to implement my and their ideas”. A PCA was conducted to test the measurement structure (KMO = .66, Bartlett’s test:  $\chi^2(15) = 222.5$ ,  $p < .001$ ). A parallel analysis indicated that two dimensions could be retained. After a varimax rotation, one item had a negative loading on the first factor (-.26) and every other factor loading ranged between .42 and .83 on the first factor. A second PCA was conducted on the five items that had a positive loading on the first factor. One dimension was retained, explaining 48% of the variance. Factor loadings ranged between .55 and .75. The five items were retained for further analysis.

*Managerial risk-taking* was measured by a four-item scale created by García-Granero, Llopis, Fernández-Mesa and Alegre (2015). This scale was developed to reflect the extent to which managers are willing to take risks to ensure the competitiveness of their business. A sample item is “As a manager, when I am confronted with decision-making situations involving uncertainty, I...(1) adopt typically a cautious, “wait-and-see” posture in order to minimize the probability of making costly decisions...(7) adopts typically a bold, aggressive posture in order to maximize the probability of exploiting potential opportunities”. A CFA indicated negative covariances between the items, and that the four items did not load on a single latent construct ( $\chi^2 = 156.07$ ,  $df = 97$ ,  $p < .05$ ; CFI = .00; NNFI = -1.06; RMSEA = .22; SRMR = .12). We conducted a PCA to identify the dimensionality of the scale (KMO = .41, Bartlett’s test:  $\chi^2(6) = 30.21$ ,  $p < .001$ ). A parallel analysis revealed that three dimensions were needed. Two items loaded on the same dimension but had a low correlation ( $r = .28$ ). Due to the weakness of the scale psychometric properties, we were not able to measure the construct and thus we removed the variable from our model.

*Creative role identity.* We created 8 items based on the definition of creative role identity from Tierney and Farmer (2011) and Karwowski (2014) to reflect creative identity in the managerial role (see Appendix 5.1). Sample items are “Creativity is a subject that concerns me more than other managers” and “I think it is not necessary to be creative to be a good manager” (reversed). A PCA (KMO = .78, Bartlett’s test:  $\chi^2(28) = 339.1$ ,  $p < .001$ ) revealed the existence of two dimensions. In order to create a unique score of creative role identity, the two items that had greater loadings on the second dimension were removed. A CFA confirmed that the six items loaded significantly on a single factor ( $\chi^2 = 10.39$ ,  $df = 9$ ,  $p < .05$ ; CFI = .99; NNFI = .99; RMSEA = .03; SRMR = .03).

*Organizational creative expectations* were assessed using the scale of Tierney and Farmer (2004). The scale is composed of 3 items. A sample item is “Creativity is required in my daily work”. We conducted a PCA (KMO = .72, Bartlett’s test:  $\chi^2(3) = 289.45, p < .001$ ). A single factor was identified, explaining 81% of the total variance. Factor loadings were comprised between .87 and .92. Consequently, we kept every item for further analyses.

*Innovative behaviors* were assessed using the scale of Dorenbosch, Engen, Van, and Verhagen (2005). This scale is composed of 16 items that are supposed to load on two dimensions reflecting respectively creativity or innovation oriented behaviors (*ibid.*). Sample items, for respectively each dimension, are “To what extent do you generate new solutions to old problems?” and “To what extent do you get to transform new ideas in a way that they become applicable in practice?” A CFA testing these two dimensions show a poor fit of the model to our data ( $\chi^2 = 318.62, df = 103, p < .05$ ; CFI = .89; NNFI = .87; RMSEA = .11; SRMR = .06). Consequently, we conducted a PCA to identify the number of dimensions to retain (KMO = .94, Bartlett’s test:  $\chi^2(120) = 1881.31, p < .001$ ). A single factor was identified, explaining 53% of the total variance. Factor loadings ranged between .52 and .80. Every item was kept for further analysis and assumed to assess a unique construct.

## Results

### Measurement model

Data were screened for assumptions of linearity, normality, homogeneity and multicollinearity (Tabachnick & Fidell, 2001). Ten respondents were identified through Mahalanobis distance as multivariate outliers ( $\chi^2(121) = 179.6, p < .001$ ), and were subsequently deleted from our sample. The sample used for the final analyses is composed of 181 managers.

We conducted a series of CFA to test our measurement model. Scales assessing personal needs and organizational supplies applied a bifactor model. To retrieve such structure, we computed composite scores by weighting items with their relative contribution to the general and their specific factor (DeMars, 2013). Thus, measures of needs and supplies for organizational climate were already under the form of scores for each dimension. Consequently, we did not conduct CFA only on items that represented the mediating and dependent constructs. The first model included every item selected from the PCA and CFA analyses conducted for every scale independently. It postulated that items would load

distinctively on six latent variables. Results for this first model showed an unacceptable fit with the data ( $\chi^2 = 1825.98$ ,  $df = 974$ ,  $p < .05$ ; CFI = .82; NNFI = .80; RMSEA = .07; SRMR = .08). Based on the suggested modification indices and the standardized expected parameter change (Rosseel, 2012; Whittaker, 2012), we improved the model by removing four items of the scale assessing job satisfaction, four items of the scale assessing affective commitment, three items assessing Creative role-identity and the entire construct of creative self-efficacy. We stipulated also several correlated errors between items loading on the construct of innovative behaviors (see Appendix 5.2). The second version of model shows an acceptable fit with the data ( $\chi^2 = 608.86$ ,  $df = 380$ ,  $p < .05$ ; CFI = .93; NNFI = .92; RMSEA = .05; SRMR = .06). The output of this final CFA is presented in Appendix 5.2. From this final selection of items, we computed the means, standard deviations and correlations among the variables that are presented in Table 15. To investigate the reliability and validity of the five remaining scales, we estimated the factors loading for each item on their respective construct, average variance extracted (AVE) and composite reliabilities (CR). These coefficients were estimated using a maximum likelihood technique (Fornell & Larcker, 1981). We calculated also the Cronbach's alphas. All these estimates are presented in Appendix 5.1.

We looked first at the standardized coefficients for each item. Two items composing the scales of innovative work behaviors and one item composing the scale of job satisfaction had loadings slightly inferior to .60 (respectively .46, .59 and .55). Other standardized coefficients from items to their factors ranged from .60 to .92. Moreover, each item loaded significantly on its underlying construct ( $p < .001$ ). At this point, every item was kept to test our hypotheses.

Table 15 shows overall means and standard deviations for each variable except for the constructs assessing organizational supplies and personal needs, which have been previously scaled to create composite scores; it also presents CR, AVE, Cronbach's alphas for each construct and the correlations between the different measures.

For each construct assessed in the questionnaire, the composite reliabilities ranged between .75 and .92. Moreover, Cronbach's alphas range from .75 to .92. These values argue in favor of acceptable reliabilities for the different construct assessed. The average variance extracted ranged between .50 and .71. Such estimates are considered acceptable and confirm the convergent validity of the measures (Fornell & Larcker, 1981; Peng & Lai, 2012). To confirm the discriminant validity, we verified that the average variances between the constructs and

their items are greater than the variance shared between scales. To do so, we compared the square root of average variance extracted of each construct with its correlations with other constructs. As reported in Table 15, every square roots of average variance extracted is greater than the correlations between each construct and the others, providing support for the discriminant validity. Table 15 shows that the correlations between the mediating variables and innovative behaviors were all significant and positive.

Table 15. Means, standard deviations, and correlations. Cronbach's alphas are presented in the diagonal

Variable	M	SD	CR	AVE ( $\sqrt{\text{AVE}}$ )	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16
1. S. Climate	0.00	1.00																	
2. N. Climate	0.00	1.00			.24**														
3. S. Support	0.00	1.00			.24**	.03													
4. N. Support	0.00	1.00			.01	.12	-.13												
5. S. Relations	0.00	1.00			.27**	.18*	-.35**	.00											
6. N. Relations	0.00	1.00			.03	.33**	-.06	-.15*	.14										
7. S. Challenge	0.00	0.84			.25**	.10	-.15*	.27**	-.23**	-.13									
8. N. Challenge	0.00	0.86			.23**	.23**	.02	.03	.04	-.23**	.18*								
9. S. Clarity	0.00	1.00			.24**	-.09	-.18*	.00	-.18*	.01	-.24**	.02							
10. N. Clarity	0.00	1.00			.10	.25**	.20**	-.03	.04	-.29**	.04	-.09	-.15*						
11. Satisfaction	5.21	1.06	.82	.54 (.73)	.69**	.16*	.04	.08	.13	-.01	.49**	.19**	.11	-.02	(.82)				
12. Commitment	4.78	1.25	.80	.50 (.71)	.54**	.26**	.25**	.04	.04	-.03	.30**	.17*	.04	.12	.60**	(.80)			
13. Role identity	5.50	1.05	.75	.51 (.71)	.29**	.16*	.00	.29**	.07	-.03	.32**	.19**	-.07	-.08	.28**	.16*	(.75)		
14. Orga. Expectations	3.99	1.37	.88	.71(.84)	.49**	.24**	.39**	.05	.02	-.01	.07	.12	-.02	.08	.33**	.38**	.38**	(.88)	
15. Innovative behaviors	4.78	0.97	.92	.50 (.71)	.44**	.33**	.32**	.12	.06	.06	.24**	.22**	-.16*	.07	.34**	.34**	.48**	.47**	(.92)

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < .01$ . M, SD, CR and AVE are used to represent mean and standard deviation, composite reliabilities and average variance extracted respectively. Values of Cronbach's alphas are presented in diagonal. S = Supplies, N = Needs.

## Common method variance

The present data were collected at one time for each participant and through the same questionnaire and thus implies numerous potential sources of common method biases (Podsakoff et al., 2003). We tried to avoid the bias of artifact relationships by using negative and positive affirmations. Moreover, we wish to study the nonlinear relations between supplies, needs and innovative behaviors and the effects of interactions between S-N fit and respectively organizational expectations and creative role identity on commitment, satisfaction and innovative behaviors. Evans (1985) demonstrated that common method variance is unlikely to induce factual and interactive relations between constructs. Thus, in the present study, investigating indirect and moderated effects of SN fit may little be affected by common method variance (Edwards, 1996).

Nevertheless, we conducted two analyses to identify the extent to which common method variance threatened the analyses for the present data. We conducted first a Harman one-factor test on every item that was kept, including items that constituted the measures of organizational supplies and personal needs. This factor accounted for 24.8% of the variance, which is not weak but insufficient to explain the majority of the covariance between the variables. We conducted also a CFA loading every item on one single factor (Podsakoff et al., 2003). Indices of fit demonstrate that this solution does not fit the data ( $\chi^2 = 3135.73$ ,  $df = 819$ ,  $p < .05$ ; CFI = .50; NNFI = .47; RMSEA = .13; SRMR = .13). We conclude therefore that the following results are not likely to be come from method variance.

## *Strategy of analysis*

Analyses were conducted with R statistical software (R Development Core Team, 2016) using the packages *apaTables* (Stanley, 2017), *lavaan* (Rosseel, 2012), *lm.beta* (Behrendt, 2014), *paran* (Dinno, 2012), *psych* (Revelle, 2017), *RSA* (Schönbrodt, 2016) and *rsm* (Lenth, 2009). Results were tested and will be presented in the following order: (1) Direct effects of SN fit on innovative behaviors, (2) mediating effects of job satisfaction and organizational affective commitment, and (3) moderation effects of creative role identity and organizational creativity expectations.

## Polynomial regressions

For several decades, research on the effect of the fit between two variables used differences scores to assess the degree of fit. For example, several authors relied on the squared difference between supplies (S) and needs (N) (e.g., Caplan, Cobb, French, Harrison, & Pinneau, 1975), expressed by the function:

$$Z = b_0 + b_1(S - N)^2 + e \quad (1)$$

In this case, a positive sign of  $b_1$  indicates that the greater the difference between the variables S and N (whatever the direction of this difference), the more the dependent variable (Z) increases. As Edwards demonstrated in several studies (Edwards, 1994, 1995, 2001, 2007b; Edwards & Parry, 1993), the use of differences scores implies several limitations that polynomial regressions help to overcome in the analysis of the fit between two variables. In particular, and in contrast to difference scores, polynomial regressions enable to study the extent to which each of the scores predicts individually the dependent variable or in what sense the incongruence between the two predictors leads to an increase in the dependent variable.

Thus, using polynomial regressions and response surface analyses (RSA) allows investigating the extent to which the adequacy of two independent and commensurate variables predicts dependent variables (Edwards, 2007b; Shanock, Baran, Gentry, Pattison, & Heggstad, 2010). More precisely, polynomial regressions and RSA allow us to study (1) whether and how the fit between needs and supplies predicts innovative behaviors, (2) whether and how the degree of incongruence predicts innovative behaviors, and (3) how the direction of incongruence predicts innovative behavior. For example, our analysis could yield a result such that: managers report more creative behaviors when there is a gap between their needs for challenge and the perceived current challenge of their tasks, but only when this gap is expressed in the sense that needs exceeds supplies. The polynomial regressions are expressed by the following equation:

$$Z = b_0 + b_1S + b_2N + b_3S^2 + b_4SN + b_5N^2 + e \quad (2)$$

where Z is a dependent variable, S and N are the two predictors (respectively, supplies for creativity and needs for creativity). Thus, the dependent variable is regressed on each of the two predictors (S and N), their interaction (SN) and each of the squared predictors ( $S^2$  and  $N^2$ ). If the variance of the dependent variable explained by the regression equation ( $R^2$ ) differs significantly from zero, then the result of this regression is used to show graphically, and in a

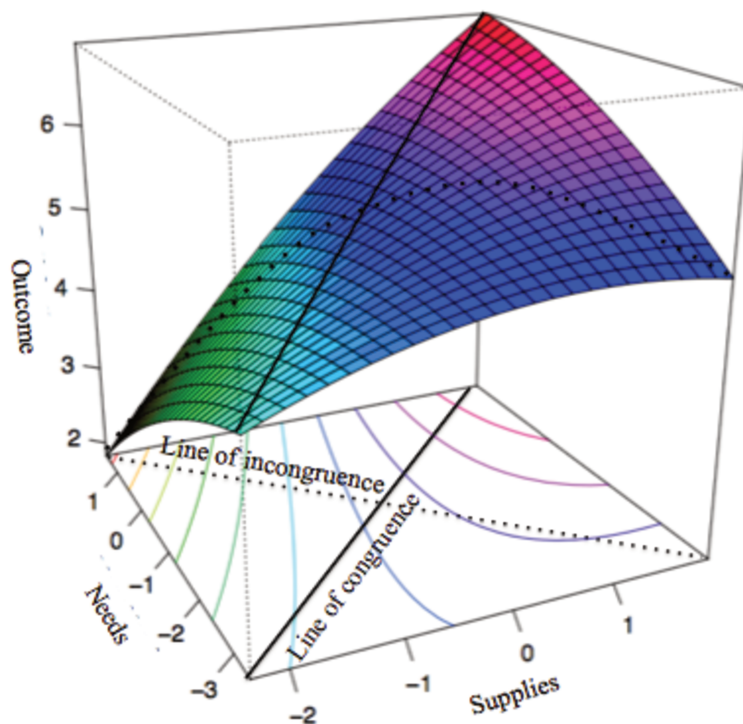


three-dimension space, the effect of the predictors on the dependent variable. The values of slopes and the shape of the curves from the response surface make it possible to interpret these effects.

## Response surface methodology

Response surface analyses facilitate the interpretation of the effects of SN fit on innovative behaviors. Coefficients from the polynomial regression analyses are used to plot in a three-dimension space and examine the response surface patterns (Edwards, 1994; Shanock et al., 2010). An example of surface response is presented in figure 10.

*Figure 10.* Example of response surface depicting the effects of supplies and needs



First, we are interested in the adequacy between supplies and needs expressed by the line of congruence where  $S = N$ . On figure 10, the line of congruence is represented on the floor, as well as its projection on the response surface. Along this line, a positive and significant slope for the response surface indicates that, in the case of congruence between predictors, the greater the needs and the supplies, the greater is the dependent variable. In figure 11, we can see that the outcome slightly increases on the line of congruence as we move from the front of the figure to the back. Except for the dimension Mission clarity, we postulated a similar effect for every dimension of organizational climate. If a visual interpretation leads us to infer that there is a slope for the response surface above the line of congruence, we can verify this result

by calculating an estimate of the slope and testing its significance. The slope of the response surface above the congruence line is calculated by adding the unstandardized coefficients of resources ( $b_1$ ; see equation 2) and needs ( $b_2$ ). Thus,  $a_1 = b_1 + b_2$ .

Above the same line of congruence, we can also look at the curve of our response surface. A significant curve indicates a nonlinear relationship between the adequacy of predictors and the dependent variable. In this case, if the effect is positive, the curve has a convex form (the dependent variable is more important for the extreme values of the predictors when they are congruent). Whereas, if the effect is negative we obtain a concave form (the dependent variable is more important for the average values of the predictors when they are congruent). A non-significant curve indicates a linear relationship. Except for the dimension Mission clarity, we assumed a linear and positive relationship. The curve on the line of fit is calculated by adding the non-standardized coefficients of supplies squared ( $b_3$ ; see equation 2), of the interaction between supplies and needs ( $b_4$ ) and of needs squared ( $b_5$ ). Thus,  $a_2 = b_3 + b_4 + b_5$ .

Second, we are interested in the inadequacy between supplies and needs expressed by the line of incongruence where  $S = -N$ . On figure 10, the line of incongruence is represented by the dotted line on the floor and on its projection on the response surface. Along this line, the slope indicates the direction in which the gap between supplies and needs predicts a higher dependent variable score. If the dependent variable has a higher score when supplies exceed needs than when needs exceed supplies, then the slope is significant and positive ( $S > N$ ). Conversely, a significant and negative slope indicates the dependent variable has a higher score when the needs exceed the supplies ( $S < N$ ). On figure 10, we can see that the outcome increases on the line of congruence as supplies exceed needs. The slope on the incongruence line is calculated by subtracting the unstandardized coefficient from needs ( $b_2$ ) to the non-standardized coefficient of supplies ( $b_1$ ). Thus,  $a_3 = b_1 - b_2$ .

The curve of the line of incongruence shows how the degree of inadequacy predicts the dependent variable. When the outcome is greater in situations of congruence rather than incongruence, the curve takes a concave form. In contrast, a convex form would indicate that the outcome increases as supplies and needs differ in one of the two directions. The curve above the incongruence line is calculated by the unstandardized coefficient of supplies squared ( $b_3$ ) to which is subtracted the unstandardized coefficient of the product of supplies and needs ( $b_4$ ), to which is added the unstandardized coefficient of needs square ( $b_5$ ). Thus,  $a_4 = b_3 - b_4 + b_5$ . It is required that  $a_4$  is significant to interpret that the degree of congruence influences the outcome. Thus, a positive and significant  $a_4$  indicates a convex curve

representing that the more inadequate the predictors, the higher the dependent variable. In contrast, a negative and significant  $\alpha_4$  indicates a concave form and represent that the more predictors are in inadequacy, the lower the dependent variable. The negative and significant line of incongruence curve makes it possible to conclude that the level of adequacy is a better predictor of the dependent variable than the level of inadequacy. For example, we could identify that leaders adopt more innovative behaviors when the needs and supplies are in adequacy rather than when one predictor is superior to the other. The significance of the slopes and curves of the surface responses were evaluated using a T-test (following the method evoked by Shanock et al., 2010). Table 16 presents all the information necessary for the interpretation of surface responses.

## Direct effects of SN fit on innovative behaviors

The results of the polynomial regressions and surface analyses that correspond to hypotheses 1 to 5 are presented in Table 17. Estimates and standard errors were computed with the *RSA* package (Schönbrodt, 2016) by applying a maximum likelihood estimation method. Because squared and interaction terms do not follow a normal distribution, the RSA function uses the Satorra-Bentler test (Satorra & Bentler, 1988) and robust standard errors (Schönbrodt, 2016).

Table 16. Response surface interpretation

Line	Effect	Calculation	Significant effect	Positive effect	Negative effect
S = N	Slope (a <sub>1</sub> )	b <sub>1</sub> + b <sub>2</sub>	Levels of X and Y in fit predicts the DV	The more X and Y increase, the more the DV increases	The more X and Y increase, the more the DV decreases
	Curve (a <sub>2</sub> )	b <sub>3</sub> + b <sub>4</sub> + b <sub>5</sub>	Non linear relationship between X=Y and the DV	Convex shape: the DV increases when X=Y is high and/or low	Concave shape: the DV increases when X=Y has an intermediary value
S = -N	Slope (a <sub>3</sub> )	b <sub>1</sub> - b <sub>2</sub>	Misfit between X and Y in a specific sense predicts the DV	The more X exceeds Y, the more the DV increases	The more Y exceeds X, the more the DV increases
	Curve (a <sub>4</sub> )	b <sub>3</sub> - b <sub>4</sub> + b <sub>5</sub>	The degree of fit predicts the DV	Convex shape: the more the misfit between X and Y, the more the DV increases	Concave shape: the more the fit between X and Y, the more the DV increases

Note. DV = Dependent variable

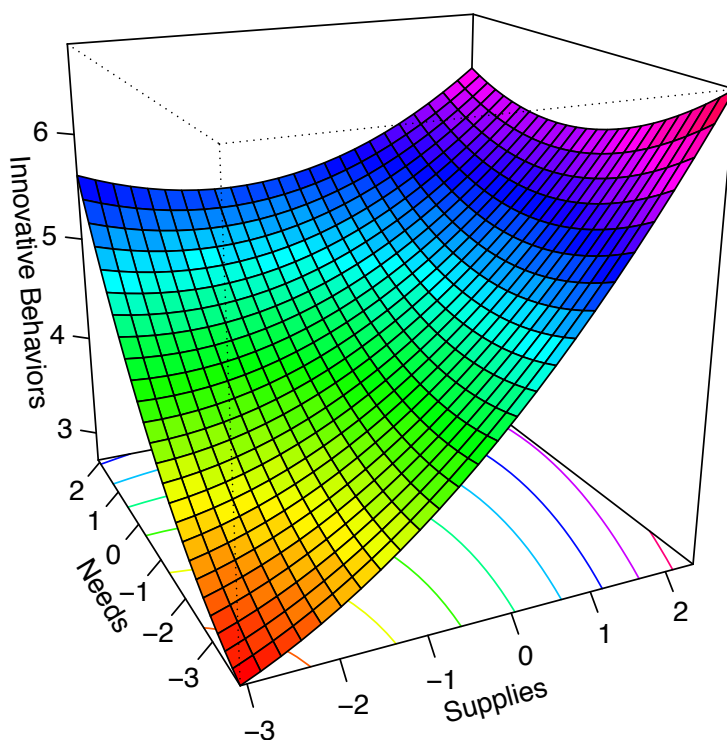
Table 17. Results for polynomial regression expressing direct effects of organizational supplies and individual needs for creativity on innovative behaviors.

Dimensions	Constant	S	N	S <sup>2</sup>	SN	Y <sup>2</sup>	S = N line		S = -N line		R <sup>2</sup>	ΔR2
	b <sub>0</sub>	β <sub>1</sub>	β <sub>2</sub>	β <sub>3</sub>	β <sub>4</sub>	β <sub>5</sub>	a <sub>1</sub> : b <sub>1</sub> + b <sub>2</sub>	a <sub>2</sub> : b <sub>3</sub> + b <sub>4</sub> + b <sub>5</sub>	a <sub>3</sub> : b <sub>1</sub> - b <sub>2</sub>	a <sub>4</sub> : b <sub>3</sub> - b <sub>4</sub> + b <sub>5</sub>		
Organizational climate	4.67***	.41***	.26***	.11	-.16*	.10	.65***	.02	.14	.23*	.27***	4.74**
Organizational support	5.01***	.26***	.11	-.15*	-.05	-.17*	.36***	-.28**	.14	-.19*	.18***	4.19**
Positive interpersonal relationships	4.76***	.06	.06	.01	-.02	.02	.12	.00	-.01	.04	.01	0.15
Challenge	4.9***	.18*	.12	-.11	-.13†	-.10	.35**	-.30***	.07	.01	.15***	4.37**
Mission clarity	4.8***	-.07	.05	.08	.20*	-.04	-.01	.20	-.12	-.15*	.06	1.47

Notes. S = Supplies, N = Needs. Table entries are standardized coefficients. The column R<sup>2</sup> indicates the variance explained by the five quadratic terms. The column ΔR<sup>2</sup> corresponds to the difference test for the R<sup>2</sup> values of the constrained model (S-N)<sup>2</sup> and the unconstrained model (S + N + S<sup>2</sup> + SN + N<sup>2</sup>): F-Test, DF = 4. \* indicates  $p < .05$ , \*\* indicates  $p < .01$ , \*\*\* indicates  $p < .001$ .

Hypothesis 1 predicted that innovative behaviors (a) increases as supplies and needs for organizational climate increase in congruence and (b) decreases only when needs exceeds supplies. Because the polynomial regression contributes to explain a significant part of the variance of innovative behaviors, hypothesis 1 can be tested. Figure 11 depicts the results regarding the effect of organizational climate fit on innovative behaviors.

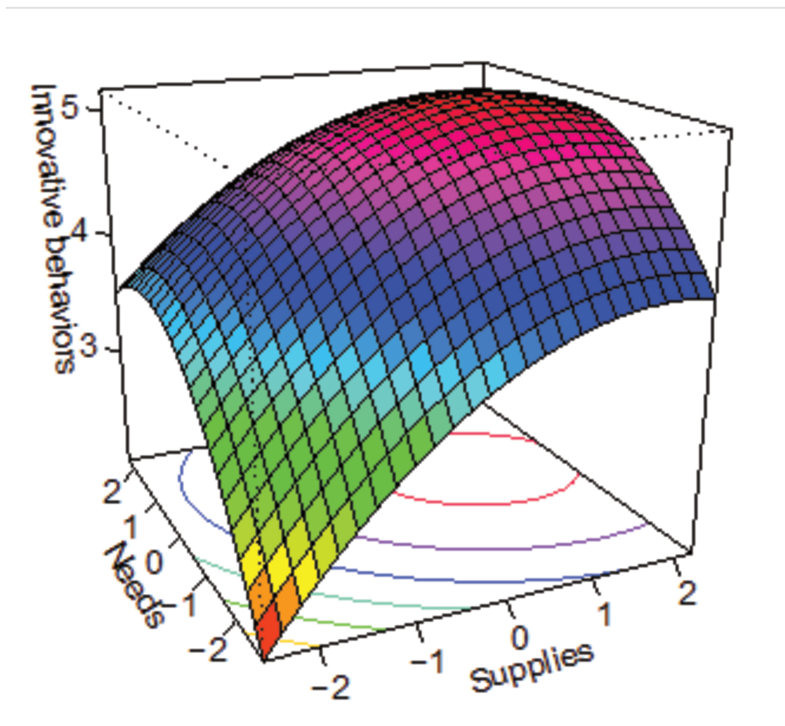
*Figure 11.* Estimated surface relating SN fit of organizational climate on innovative behaviors



The linear additive relationship along the line of congruence related to innovative behaviors is expressed by a significant and positive  $a_1 = .65$  ( $p < .001$ ) and a non-significant  $a_2 = .02$ . Thus when both supplies and needs for organizational climate are congruent and increase, innovative behaviors increase significantly, supporting hypothesis 1.a. An  $a_4 = .23$  ( $p < .05$ ) that is significant and positive signifies that innovative behaviors increases as the discrepancy between supplies and needs increase. The  $a_3 = .14$  will indicate the direction of the discrepancy. As it is positive, innovative behaviors increase when supplies exceeds needs for organizational climate. However,  $a_3$  is not significant. Thus innovative behaviors do not increase significantly more when supplies exceed needs than when needs exceed supplies. Thus, hypothesis 1.b is supported. Overall results suggest that leaders adopt more innovative behaviors when the organization provides a positive climate for creativity that exceed leaders' needs than when supplies meet needs (see figure 11).

Hypothesis 2 predicted that innovative behaviors (a) increases as supplies and needs for organizational support increase in congruence and (b) decreases only when needs exceed supplies. The related polynomial regression accounted for a significant part of the variance of innovative behaviors, allowing us to test the hypothesis (see Table 17). Figure 12 depicts the results regarding the effect of organizational support fit on innovative behaviors. On the line of congruence, a positive and significant  $a_1 = .36$  ( $p < .001$ ) indicates that as supplies and needs are congruent and increase, innovative behaviors increases. However, the significant  $a_2 = -.28$  ( $p < .01$ ) indicates the relation between SN fit for organizational support and innovative behaviors is not linear.

*Figure 12.* Estimated surface relating SN fit of organizational support on innovative behaviors



A negative value for  $a_2$  indicates a concave shape; meaning that, above the line of congruence, innovative behaviors increase as SN fit increases then decreases when values of supplies and needs are too high. As hypothesis 2.a postulated a linear and positive effect, it is therefore not supported. An  $a_4 = -.19$  ( $p < .05$ ) that is significant and negative signifies that innovative behaviors increases as the congruence between supplies and needs increase. The  $a_3 = .14$  indicates that innovative behaviors increase when supplies exceeds needs for organizational climate but not significantly compared to the reversed misfit situation. Because  $a_4$  is negative and  $a_3$  is not significant, we cannot conclude that innovative behaviors

decreases only when needs exceed supplies. Thus, hypothesis 2.b is also not supported. Overall results suggest that leaders adopt more innovative behaviors when the organization provides support that fit with leaders' needs and, at the same time, when the level of support is moderate to high (see figure 12).

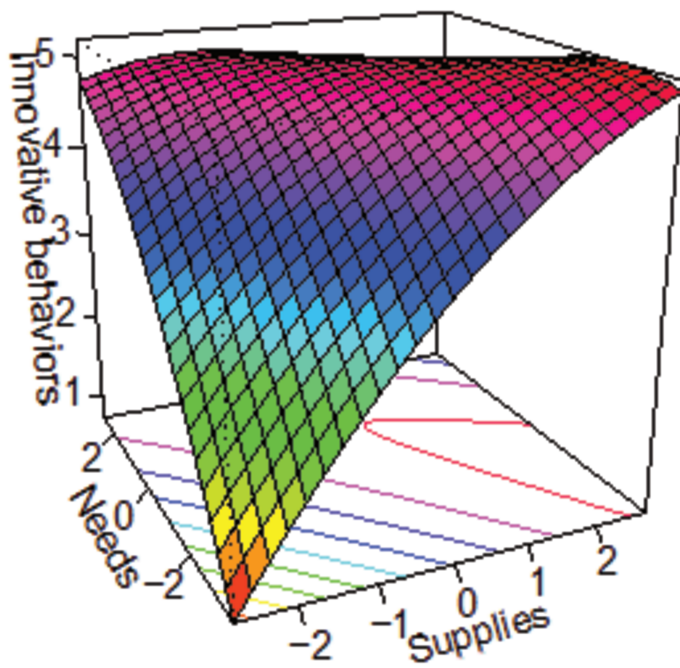
Hypothesis 3 predicted that innovative behaviors increases (a) when supplies and needs for positive interpersonal relationship increase in congruence and (b) when needs are high and exceed supplies. The related polynomial regression did not explain a significant part of the variance of innovative behaviors. The needs and supplies for positive interpersonal relationships, or their interaction did not influence innovative behaviors. Therefore hypothesis 3 is completely rejected.

Hypothesis 4 predicted that innovative behaviors (a) increases as supplies and needs for challenge increase in congruence and (b) when needs are high and exceed supplies. The related polynomial regression explained a significant part of the variance of innovative behaviors, allowing us to test the hypothesis. Figure 13 depicts the results regarding the effect of challenge fit on innovative behaviors. Above the line of congruence, a positive and significant  $a_1 = .35$  ( $p < .001$ ) indicates that as supplies and needs increase, innovative behaviors increase. The significant  $a_2 = -.30$  ( $p < .001$ ) indicates the relation between SN fit for organizational support and innovative behaviors is non-linear. The negative value of  $a_2$  indicates a concave shape; meaning that, above the line of congruence, innovative behaviors increase as SN fit increases then decrease when values of supplies and needs are too high.

Hypothesis 4.a supposed a linear and positive effect and is therefore not supported. The  $a_4$  estimate (.01) is non-significant signifying that the degree of discrepancy between supplies and needs for challenge has no effect on innovative behaviors.

The  $a_3 = .07$  indicates that innovative behaviors increase slightly, but not significantly, when supplies exceeds needs for challenge. As we can see on the figure 13, in the case where leaders have high needs for challenge, they adopt more innovative behaviors when the organization does not supply the desired level of challenge. Also, the degree of discrepancy does not influence innovative behaviors, meaning that needs exceeding supplies predicts innovative behaviors as much as an SN fit. Therefore we can conclude that hypothesis 4.b is supported. An effect that we did not predict, because of a lack of theoretical groundings, is the increase of innovative behaviors as supplies exceed needs for challenge.

Figure 13. Estimated surface related SN fit of challenge on innovative behaviors



Hypothesis 5 stated that innovative behaviors increases (a) when needs and supplies on mission clarity are congruent (either high or low) and (b) do not decrease when needs exceed supplies on mission clarity but decrease when supplies exceed needs. The related polynomial regression did not explain a significant part of the variance of innovative behaviors. Innovative behaviors were influenced only by the interaction between supplies and need ( $\beta = .20, p < .05$ ). Therefore hypothesis 5 is completely rejected.

## Theoretical model testing

The SN fit of the general dimension and two sub-dimensions (organizational support and challenge) influenced innovative behaviors. Consequently, we tested different theoretical models that investigate the moderated and mediated effect of SN fit for these three dimensions of climate on innovative behaviors. The first step consisted of testing the effect of SN fit on the mediating variables. To do so, we conducted polynomial regressions analyses where the five terms of fit ( $S$ ,  $N$ ,  $S^2$ ,  $SN$ ,  $N^2$ ) for one dimension were entered simultaneously as predictors of either job satisfaction or affective commitment. Thus, three regression analyses – one for each dimension of the organizational climate (the general dimension, organizational support and challenge) – were conducted on each mediator separately (job satisfaction and affective commitment). We considered that SN fit for each dimension predicted significantly job satisfaction or affective commitment when the variance explained



( $R^2$ ) by the five terms was significant. Results of the polynomial regression analyses and response surface analyses are presented in Appendix 5.3. Except for the effect of SN fit for organizational support on job satisfaction, every other analysis resulted in a significant part of variance explained. Consequently, job satisfaction was not included in the model we tested further for the dimension organizational support.

The second step consisted of testing the joint effects of SN fit and mediating variables on innovative behaviors. To do so, we estimated regression equations for innovative behaviors that included the five terms of the polynomial regressions plus the mediating variable(s). For example, the joint effects of organizational climate, job satisfaction and affective commitment on innovative behaviors was tested by the following equation:

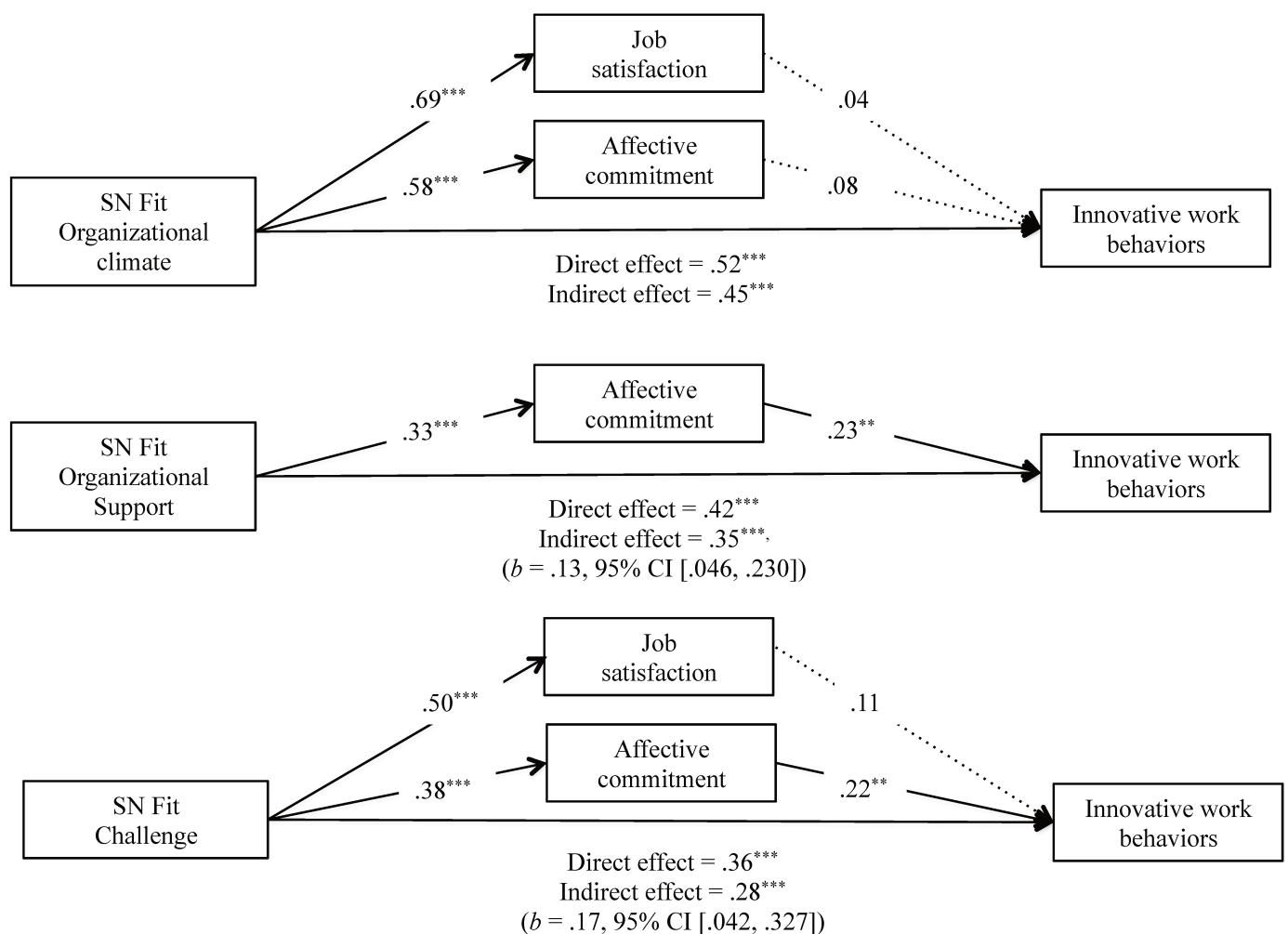
$$IWB = b_0 + b_1S + b_2N + b_3S^2 + b_4SN + b_5N^2 + b_6JS + b_7AC + e \quad (3)$$

where IWB represents innovative work behaviors, S corresponds to supplies for organizational climate, N to needs for organizational climate, JS to job satisfaction and AC to affective commitment. This equation was applied to test the effects of the three dimensions of organizational climate separately. Because SN fit for organizational support did not predict significantly job satisfaction, this latter variable was not included in the regression equation testing the joint effect of SN fit for organizational support and affective commitment to innovative behaviors. Therefore, hypothesis 6 that stated that job satisfaction mediated the effect of SN fit on innovative behaviors was rejected for the group factor organizational support.

To obtain path coefficients relating the fit to the mediating (job satisfaction and affective commitment) and the dependent variable (innovative work behaviors), we needed to transform the five terms entered in polynomial regressions into a unique independent variable. To do so, we created block variables (Cable & Edwards, 2004; Heise, 1972; Igra, 1979; Marsden, 1982). A block variable is constructed by weighting each of the five predicting variables entered (S, N,  $S^2$ , SN, and  $N^2$ ) in the regression by their related unstandardized coefficients ( $b_1$ ,  $b_2$ ,  $b_3$ ,  $b_4$  and  $b_5$ ) and then summing the five terms. For example, the block variable associated with the previous equation equals  $b_1S + b_2N + b_3S^2 + b_4SN + b_5N^2$ . Block variables were created to estimate the paths from SN fit (for each dimension respectively) to affective commitment, job satisfaction (for the factors organizational climate and challenge only) and to innovative behaviors. Next, we replaced the five terms by the block variables in each equation and re-estimated the coefficients of the regression equations. The part of variance explained did not change between equations with the five terms and equations with the block variables. Ultimately, we were able to obtain standardized coefficients for the

effects of SN fit. Moreover, in regressions testing the joint effect of SN fit and mediating variables on innovative behaviors, the coefficients of job satisfaction and affective commitment on innovative behaviors were unaffected by the transformation of the five terms in block variables. Standardized coefficients from the regression analyses are presented in figure 14.

*Figure 14.* Results of regression analyses testing the direct and indirect effect of SN fit for the three dimensions of organizational climate on job satisfaction, affective commitment and innovative behaviors



Hypothesis 6 postulated that job satisfaction mediates the effect of SN fit on innovative behaviors. Results for the general dimension organizational climate showed that job satisfaction is predicted positively by SN fit ( $\beta = .69, p < .001$ ) but did not predict significantly innovative behaviors ( $\beta = .04, p > .05$ ). Hypothesis 6 is therefore rejected for the group dimension organizational climate and was previously rejected for the group factor

organizational support. Results for the sub dimension challenge showed that SN fit positively predicted job satisfaction ( $\beta = .50, p < .001$ ), which in turn did not predict innovative behaviors ( $\beta = .11, p > .05$ ). Consequently, hypothesis 6 was also rejected for the group factor challenge.

Hypothesis 7 stated that affective commitment mediates the effect of SN fit on innovative behaviors. Results for the general dimension organizational climate showed that SN fit predicted significantly affective commitment ( $\beta = .58, p < .001$ ), which in turn did not predict significantly innovative behaviors ( $\beta = .08, p > .05$ ). Regarding the dimension organizational support, SN fit predicted significantly affective commitment ( $\beta = .33, p < .001$ ), which in turn predicted innovative behaviors ( $\beta = .23, p < .01$ ). Monte Carlo simulations were used to assess the estimate and confidence intervals of the indirect effect of SN fit for organizational support on innovative behaviors through affective commitment (Tofighi & MacKinnon, 2016). Based on 10,000 Monte Carlo replications, the results confirmed that the indirect effect was significant ( $b = .13, 95\% \text{ CI } [.046, .230]$ ). Consequently, hypothesis 7 is supported for the organizational support dimension. Results for the challenge dimension showed that SN fit predicted affective commitment ( $\beta = .38, p < .001$ ) that, in turn, predicted innovative behaviors ( $\beta = .22, p < .01$ ). Based on 10,000 Monte Carlo replications, the subsequent indirect effect was significant ( $b = .17, 95\% \text{ CI } [.042, .327]$ ), supporting hypothesis 7 for the challenge dimension.

Hypothesis 8, 9 and 10 stating the mediation effects of creative-self efficacy and risk-taking could not be tested because the constructs did not show acceptable validity.

Hypothesis 11 stated that creative role identity would moderate the effect of SN fit on job satisfaction, affective commitment and innovative behaviors. Moreover, hypothesis 12 stated that organizational expectations regarding managers' creativity would also moderate the effect of SN fit on the three outcomes. Moderation effects on job satisfaction were not tested because job satisfaction did not have the expected mediated effects in the previous results. Moderation effects on affective commitment were only tested for the organizational support and challenge dimensions because we obtained the expected mediation effects for these group factors only. Finally, moderation effects on innovative behaviors were tested for the three factors separately. To test the moderation effects on affective commitment, creative role identity and organizational expectations were entered simultaneously in regression equations with the block variable representing SN fit and the interactions between SN fit and respectively the two moderators. In regression analyses testing the moderating effects on innovative behaviors, we added organizational commitment for the organizational support and

challenge dimensions. Results for each specific factor are presented in Appendix 5.4. Creative role identity did not predict significantly affective commitment when entered in regression equations with block variables of SN fit for the three factors. Furthermore, creative role identity predicted significantly innovative behaviors when entered in regression equations with each of three factors. However, none of the interactions between creative role identity and block variables representing SN fit for each dimensions showed a significant effect on innovative behaviors. Therefore hypothesis 11 is rejected for the three dimensions of organizational climate. Regarding hypothesis 12, organizational expectations showed always a positive and significant effect on affective commitment and innovative behaviors. However, none of the related interactions significantly predicted the outcomes. Therefore, hypothesis 12 is also rejected for the three factors of organizational climate.

## Discussion

Drawing on the person-organization-fit perspective, this study investigated the effects of supplies-needs fit on managers' adoption of innovative behaviors. Supplies-needs fit referred to the congruence between managers' needs for psychological resources to be creative and their perception of the extent to which their organization supplied the necessary resources. Such resources pertain to the organizational climate for creativity and innovation that is composed of a general dimension and four group dimensions: organizational support for creativity, positive interpersonal relationships, challenge, and mission clarity. As expected, results demonstrated different pattern of responses for each dimension.

Results of this study are generally consistent with past research on organizational climate and innovative behaviors (e.g., Hammond, Neff, Farr, Schwall, & Zhao, 2011; Scott & Bruce, 1994). Indeed, greater supplies almost always indicated an increase of leaders' innovative behaviors. However, focusing on specific dimensions makes it possible to highlight the importance of leaders needs for creativity resources. For example, when supplies for organizational support exceed leaders' needs, it starts to loose its positive influence on leaders' innovative behaviors. Thus, when organizations provide too much support and encouragement, leaders can perceive it as an overly strong injunction to which they will not respond.

With regard to the challenge dimension, it appears that leaders' adopt more innovative behaviors in three different situations: when supplies and needs are congruent and at a moderate level, when needs exceed supplies and when supplies exceed needs. Given the

extent to which these situations trigger innovative behaviors, we can postulate that they entail different types of motivation to adopt innovative behaviors. For example, the situation of SN fit can increase innovative behaviors, as leaders are intrinsically motivated to create and are in the optimal circumstance to do so. Situations where managers need more challenges in their task than what they currently experience could lead to innovative behaviors that aim to stimulate the manager on more difficult and uncertain tasks. Whereas, situations in which leaders experience more challenge than what they need can lead to innovative behaviors because leaders are intrinsically motivated by the task and seek to address the current challenges by finding new and adapted solutions. The positive effect of supplies exceeding needs was unexpected. If such effect is highlighted by the present results, we may postulate that it reflects a reaction that may not be stable across time. Indeed, relying on the job demands-resources model (Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001), Huhtala and Parzefall (2007) discussed the extent to which demands and challenges can drive employees' innovativeness in the short-term but as the stress increases in time, too much challenge would necessarily influence negatively creativity and innovation in the long term. Thus, practical implications of the results should not emphasize organizations' tendency to provide more challenging tasks than what leaders would need.

The dimension Positive interpersonal relationships and Mission clarity did not demonstrate any fit effect on leaders' adoption of innovative behaviors. An absence of evidence is not an evidence of absence, however, it suggests that these dimensions do not constitute a necessary condition for management innovation.

Moreover, results demonstrated that SN fit for the "Organizational climate" and "Challenge" dimensions influenced leaders' job satisfaction and that leaders' affective commitment was influenced by these two dimensions and Organizational support. Thus, building a climate supporting creativity and innovation demonstrates also positive side effects on managers' well-being and engagement in the organization. Additionally, affective commitment was found to mediate partially the effect of SN fit for organizational support and challenge on affective commitment. Thus, when organizations provide resources that fulfill managers' needs, affective commitment for the organization increases and in turn triggers innovative behaviors. SN fit seems to be the necessary condition whereas affective commitment constitutes an additional reason for managers to adopt innovative behaviors. Indeed, innovative behaviors require more efforts than routine practices (Ford, 1996), but feeling committed to an organization constitutes a reason to adopt extra-role behaviors (e.g., Becker & Kernan, 2003; S. MacKenzie, Podsakoff, & Ahearne, 1998).

## Limitations

One limitation of the present study is that we assessed supplies using the organizational climate for creativity and innovation scale. However, organizational climate, in opposition with the organizational culture, is founded on individuals' perception of their environment. Such perception refers to a subjective interpretation of how organizational practices and policies are meaningful and make sense for the individual (Rentsch, 1990). It can be seen as the interaction between the organization (its structure, culture, practices) and the individual that will judge if the organization provide resources that are satisfying regarding its own needs and expectations (Forehand, 1962). Thus, independently from the actual resources that organizations provide, leaders can form different evaluations of the dimensions of organizational climate. These evaluations are based on whether or not the resources underlying the climate dimensions are satisfying their expectations. Isaksen & Kaufmann (1990) tested the assumption that leaders working in the same groups and organizations might perceive differently the organizational climate because they assign different meanings to their work environment. They showed that leaders with different cognitive styles (adaptors and innovators) perceived differently the dimensions Challenge and Conflict of the Creative Climate Questionnaire (Ekvall, Arvonen, & Waldenström-Lindblad, 1983). A follow-up study conducted by Isaksen and Lauer (1999) extended these differences in perceptions of the dimensions Dynamism and Risk-taking. Thus, leaders evolving in organizations with similar characteristics form different perceptions of the extent to which these characteristics are present. Starting from this premise, scales of organizational climate for creativity could be considered as assessment of the fit between the amount of organizational characteristics that are supposed to affect creative behaviors, and the extent to which the amount is satisfying for the individual. In such case, the measure of supply is not entirely independent from the measure of needs. In the present study, correlations between supplies and needs were significant for three dimensions (organizational climate, challenge and mission clarity) and negative for two dimensions (organizational support and mission clarity). To counteract this effect, instructions should state that the questionnaire assesses separately supplies and needs for creativity. In addition, a more objective measure of supplies could be collected by averaging scores of managers from the same department.

A second limitation concerns the interpretation of the four group factors. The Organizational Climate for Creativity and Innovation Scale (Caroff et al., 2016; Massu et al., 2017) assesses a bi-factorial model. Consequently, the four group factors reflects the variance that remains to

be explained after the part of common variance has attributed to the general factor. Several research stressed the difficulty to interpret group factors in bi-factor models (Reise, 2012; Reise et al., 2016; Rodriguez et al., 2016). Do they still assess their theoretical constructs? We can ensure, at least, that they reflect partially their construct, without being able to identify this specific part. Do they reflect a part of the constructs that has no relationship with the creative climate and thus with individual creativity? This second question seems dispelled in the present study because organizational support and challenge has a positive direct effect on managers' innovative behaviors. Yet, we cannot guarantee that organizational support or challenge would lead to the same results if they were assessed by different scales.

The third limitation concerns the methodology used in this study. To ensure the validity of our measures, constructs of creative self-efficacy and managerial risk taking had to be removed. The link between risk-taking and creativity or innovative behaviors has been the subject of numerous studies (e.g., Dewett, 2006, 2007; Madjar et al., 2011; Tyagi et al., 2017). However, there is a lack of empirical support on this link and the relationship between risk-taking and creativity has been found to be domain-specific (Tyagi et al., 2017). To our knowledge, only García-Granero et al., (2015) proposed a scale assessing managerial risk-taking. They demonstrated the discriminant and convergent validity of the scale, which was not reproduced in the present data. The reasons underlying such differences could be due to the translation of the items, a cultural difference between their Spanish and Italian sample and our sample of French managers, or the fact that, in their study, the scale was completed by CEOs who rated their managers' tendency to take risk whereas we used the scale as a self-report measure. In fact, risk-taking might be a construct that is complex to measure via self-reports notably because it entails two different aspects: the propensity to perceive specific behaviors as risky and the propensity to engage in risky behaviors (Blais & Weber, 2006). Thus, when managers report their tendency to act in a specific way that researchers considered as the risky option it does not necessarily evoke the same risk to every manager. As a matter of fact, we could easily consider that managers who adopted specific risky behaviors previously and who performed well these behaviors are subsequently diminishing the propensity of risk that these behaviors entails. Thus, future research may need to develop scales assessing leaders' risk perception and risk-taking simultaneously. Moreover, studying the relationship between managers' risk perception, risk-taking and creativity could demonstrate that managers who are the more creative are actually the ones that have a lower perception of risk propensity and thus who adopt more behaviors that others consider risky. Finally, the link between managerial creativity and risk may be more or less important

depending on the phase of the process. Indeed, we can easily picture that thinking of new ideas is less risky than suggesting or implementing them.

Regarding the scale of creative self-efficacy, we were not able to establish its discriminant validity. After consideration, we believe that creative role-identity and creative self-efficacy might have been operationalized in a way that confounded the constructs. Yet, they were supposed to reflect two concepts that are theoretically distinct. Indeed, creative self-efficacy refers to the self-perception “that one has the ability to produce creative outcomes” (Tierney & Farmer, 2002, p. 1138), whereas creative role-identity refers to an “individual’s identification with conducting creative work” (Tierney & Farmer, 2011, p. 278). Thus the first concept implies that if managers had to act creatively, they perceive that they would perform well, whereas the second concept focuses on the importance managers attribute to acting creatively in their activities. Tierney and Farmer (2011) studied previously the relationship between creative role identity and creative self-efficacy. They established the discriminant validity of the two constructs and demonstrated that employees’ creative role identity predicted their creative self-efficacy. Thus, issues that arose in the present study may be due to the scale we used rather than the possibility that the two concepts overlapped each other.

## Practical and theoretical implications

Results demonstrated that the dimensions of organizational climate should not always be supplied to the maximal extent, particularly regarding support for creativity and challenge. Indeed too much support can be perceived as a pressure to create and hinder leaders’ adoption of innovative behaviors. Similarly, too much challenge can increase managers’ adoption of innovative behaviors but may be detrimental in the long term (Huhtala & Parzefall, 2007). Organizations should invest considerable efforts in identifying and understanding leaders’ specific needs before supplying them resources to be creative. Moreover, a lack of perceived needs often predicted a lack of innovative behaviors. Having managers with no need for psychological resources to be creative does not imply that they will be able to innovate with no support or resources. On the contrary, a lack of need might be the sign of a lack of motivation to innovate. Consequently, organizations should focus on identifying managers who are well aware of their needs to be creative as it could be the sign that they are willing to suggest and experiment new practices. Moreover, managers who express high needs for creativity might be able to adopt innovative behaviors in situations where they do not have the necessary supplies. Thus, expressing more needs is almost always synonym of acting creatively, regardless the supplies provided.



Results of this study highlighted principally the need to conceptualize and assess the organizational climate for creativity as a multidimensional construct. Indeed, SN fit for each dimension of the organizational climate showed different effects on job satisfaction, affective commitment and mostly innovative behaviors. This call has been expressed previously (Amabile et al., 1996; Anderson, Potocnik, et al., 2014; Anderson & West, 1998; Hunter et al., 2005, 2007). It finds an echo in the latest research that followed an interactionist approach (e.g., Blomberg & Kallio, & Pohjanpää, 2017; Shanker et al., 2017) but was never applied in a fit perspective (e.g., Choi, 2004; Livingstone et al., 1997; Livingstone & Nelson, 1994).

The second most important implication is that the present research demonstrates the benefit from taking into account both needs and supplies when studying the effect of organizational climate. Most research studies only the effect of supplies. However, except for Interpersonal positive relationship and mission clarity, results demonstrated that individual needs relative to each dimension plays a significant role on innovative behaviors. Research in the field of organizational creativity have started recently to adopt a fit approach (Choi, 2004; Isaksen & Aerts, 2011; Livingstone et al., 1997; Livingstone & Nelson, 1994; Sarac et al., 2014; Sen, Acar, & Cetinkaya, 2014; Spanjol et al., 2014) and we are convinced that addressing the antecedents of organizational creativity in terms of degree of adequacy between individuals' predispositions or needs and their environment rather than the sum of individual and organizational factors can contribute to develop current knowledge.

## Avenues for future research

We stressed in the introduction the importance to conceptualize the organizational climate in a multidimensional approach. However, the present study assessed the effect of the different dimensions of the organizational climate separately. Consequently, further research should aim to investigate simultaneously the relative effects of SF fit for each dimension on innovative behaviors. Moreover, we could postulate that the effects of SN fit for each dimension may interact. The present results showed that when tasks are more challenging than what managers expect, it could be perceived as a demand toward which managers will respond by adopting innovative behaviors. Martin, Salanova and Peiró (2007) demonstrated that employees have the ability to cope with high demands by adopting innovative behaviors if they feel supported by their organization. Consequently, further research could investigate the extent to which the influence of a misfit situation (for challenge for example) on innovative behaviors could be moderated by a SN fit for organizational climate or support.

Following previous research (e.g., Binnewies & Gromer, 2012), we believe that the dimensions of the organizational climate and their level of fit have different influences on specific creative behaviors. For example, we could postulate that SN fit for interpersonal positive relationship has a greater influence on behaviors that are related to the steps of idea promotion and idea implementation than on idea generation. To assess innovative behaviors, we selected a scale that was supposed to demonstrate a multidimensional structure and that could have allowed us to test such effects. Unfortunately, we were not able to retrieve more than one general dimension of innovative behaviors in the present study. By selecting scales that are specific to ideation (e.g., RIBS, Runco, 2008) or promotion and implementation (e.g., Howell et al., 2005), future research could attempt to demonstrate that SN fit for different dimensions of organizational climate have different effects on the specific phases of the innovation process.

Also, the present research focused on leaders' innovative behaviors. We postulated based on theoretical reasoning that effects of SN fit on organizational climate would differ from managers to non-managers (e.g., Kwasniewska & Necka, 2004). Future research could compare these two actors of the organization in order to help distinguishing the specificities regarding the emergence of management and technological innovations.

Finally, we suppose that when innovative behaviors increase as a cause of SN misfit (e.g., as in the case for the dimension challenge), innovative behaviors can be oriented toward finding solutions to access a greater fit between their needs and supplies. To verify this statement, future research could adopt a longitudinal design. In this way, scholars could identify if fit and misfit situations lead to similar innovative behaviors; or if innovative behaviors in misfit situations enable an improvement in a sense of better congruence between supplies and needs.

# Study 7. Value misfit

## Introduction

The starting point of the last study is the effect of job dissatisfaction on innovative behaviors. The triggering effect of dissatisfaction on creativity or management innovation has been previously highlighted but has not been a topic for advanced research (Birkinshaw & Mol, 2006; Zhou & George, 2001). When leaders experience job dissatisfaction, they can respond in four ways: they can stay and comply, they can exit the company or, they can also voice their dissatisfaction (Rusbult, Farrell, Rogers, & Mainous, 1988). Voices surface when leaders are dissatisfied but decide to remain in their organization. In such cases, they can actively try to improve the current situations by searching for new practices and advocating changes that aim to improve their working conditions. From that perspective, Zhou and George (2001) investigated the conditions that could possibly lead from job dissatisfaction to creativity. They found that creativity could intervene as an expression of voice when individuals were dissatisfied and had a high continuance commitment toward their organization. However, Rusbult et al. (1988) showed that innovative behaviors were not the only possible response to dissatisfaction. In the present study, we wish to investigate if dissatisfaction that results from specific situations have the possibility to trigger an active response: innovative behaviors, rather than a passive response: compliance. Thus, contrary to Zhou and George (2001), the present study seeks to investigate the potential sources of job dissatisfaction and their mediated effect on innovative behaviors.

## Heterogeneity: a source of dissatisfaction and creativity

Organizations attract and select individuals that are similar (Schneider, 1983). As a consequence, the workforce becomes more homogenous in terms of values, practices and personalities (*ibid.*). Meanwhile, individuals who do not fit in the organization eventually leave (Schneider, 1987). Such results have been investigated through a fit approach. Indeed, Chan (1996) demonstrated that a misfit of problem-solving styles, assessed by the Kirton Adaption-Innovation scale (Kirton, 1976, 1989), predicted employee' turnover.

In research on the homogeneity of managers' personality, Schneider, Smith, Taylor and Fleenor (1998) found that managers had relatively similar personalities within organizations and relatively different personality profiles between organizations. Such homogeneity leads to

a better stability for the organization, more job satisfaction and commitment for collaborators, and to a better agreement regarding the norms, the culture and consequently the behaviors to adopt (Schneider, Goldstein, & Smith, 1995). Based on this attraction-selection-attrition theory (Schneider, 1983, 1987), Chatman and her colleagues (Chatman, 1989; O'Reilly, Chatman, & Caldwell, 1991) demonstrated that a fit between individuals and organizational values predicted commitment, job satisfaction, performance and employees' retention. However, if a supply-value fit between the manager and his/her organization leads to numerous positive consequences, it could also lead to some disadvantages. For example, homogeneity negatively impacts leaders' adaptability, flexibility, ability to change, creativity and innovativeness (Bretz, Ash, & Dreher, 1989; Pech, 2001; Schneider et al., 1998; Schneider et al., 1995). In contrast, diversity and heterogeneity in teams and organizations has been found to enhance individuals' ability to question the status quo, to diverge on new ideas and to express creative ideas (Chatman, Polzer, Barsade, & Neale, 2007; McMillan-Capehart, 2005).

Consequently, scholars have become interested in the positive effects of misfit. For example, Simmering, Colquitt, Noe, and Porter (2003) demonstrated that employee development, which refers to "a self-initiated, self-directed means by which employees improve their competencies and work environment" (London, 1989; London & Smither, 1999; cited in Simmering et al., 2003, p. 954) is initiated by a misfit between their needs for autonomy and the related organizational supplies.

Nevertheless, research on the effects of misfit focused mainly on job crafting, which is conceived as "the physical and cognitive changes individuals make in the task or relational boundaries of their work" (Wrzesniewski & Dutton, 2001, p. 179). Several researchers postulated that job crafting was a potential response in misfit situations that had the potential to counteract the negative effects of misfit because employees take actively and positively initiatives in improving their job and role in the organization (Demerouti, 2014; Tims & Bakker, 2010). Creativity and job crafting are interrelated when creativity is focused on one's job improvement (Berg, Dutton, & Wrzesniewski, 2008; Wrzesniewski & Dutton, 2001). As stated by Wrzesniewski and Dutton, "job crafting theory resembles role innovation theory in that there is an assumption that employees can act upon the job to create a better fit." (2001, p. 188). Thus, assumptions about job crafting as a positive response to misfit may apply to innovative behaviors. Moreover, job crafting is assumed to be a result from a misfit between an individual and his/her organization, and at the same time, a solution to reduce this misfit.

Assumptions about the effects of misfit on job crafting have not been empirically tested. Vogel, Rodell, and Lynch (2016) studied the moderation effect of job crafting on the effects of a misfit between individual and organizational values. Their results show that job crafting can help counteracting the negative effect of the incongruence between the values of an individual and his/her organization. Such findings opposed the attraction-selection-attrition theory (Schneider, 1983, 1987) by demonstrating that value incongruence does not necessarily lead to turnover. However, previous research highlighted that value misfits could predict job crafting (Demerouti, 2014; Tims & Bakker, 2010; Wrzesniewski & Dutton, 2001) and further studies are needed to demonstrate such effects.

More specifically, concerning creativity, Jones, Svejenova, and Strandgaard (2011) asserted that individuals in organizations could feel constrained by the existing norms, which drives them to engage in creative actions that aim to challenge some of the existing rules. Individuals who engage in innovation because of such dissatisfaction are referred to as mavericks. Authors advised future research to investigate this specific process that unfolds from constraints on organizational innovation.

In organizations, existing norms are derived from the culture and the values that are highlighted as the common foundation for every employee (Schein, 1992). Thus, the present research will seek to identify how individuals whose values differ from those of their organization can express creativity as a way to improve their work situation. More precisely, we expect that value misfit predict leaders' dissatisfaction with prescribed practices, which in turn activates the adoption of innovative behaviors.

## Individual and organizational values

For Schwartz (1992, 1999), values are the concepts or beliefs that transcend specific situations and that guide the way individuals, such as leaders, select and evaluate behaviors. In the organization, values determine the culture, which in turn affect partially leaders' evaluation and adoption of specific practices (Schein, 1992). Thus, leaders' practices are predicted by both his/her personal and organizational values (Sagiv & Schwartz, 2007). When these values are congruent, leaders are expected to comply, as they are satisfied with the prescribed practices. The main goal of the present study is to investigate if, when values that are important for leaders differ from the organizational ones, leaders can actively engage in innovative behaviors in order to achieve a more satisfying situation. Thus, we adopt a supplementary fit approach that investigates effects of similarities or dissimilarities between

individuals and organizations, but we focus more specifically on the extent to which values incongruence can predict innovative behaviors.

Several studies examined previously the effect of value congruence on different outcomes, such as job satisfaction, intent to stay, organizational commitment, work attitudes (e.g., Chatman, 1989; Edwards & Cable, 2009; Finegan, 2000; Kalliath, Bluedorn, & Strube, 1999; Kristof, 1996; Ostroff & Judge, 2007; Posner, 1992; Vandenberghe & Peiro, 1999). In reviews on Person-Organization (PO) fit research, Kristof (Kristof-Brown et al., 2005; Kristof, 1996) found that PO fit was predominantly studied regarding individual and organizational values. Effects of PO values fit on job satisfaction and organizational commitment have been extensively demonstrated (Kristof-Brown et al., 2005). Conversely, job dissatisfaction has been highlighted as a consequence of person-organization value misfit (Wheeler, Gallagher, Brouer, & Sablinski, 2007), but to our knowledge specific outcomes such as creativity and innovation have never been tested. From previous conceptions of misfit effects on job crafting, we postulate that incongruence between leaders and organizations values will predict leaders' innovative behaviors. Moreover, because misfit decreases job satisfaction (Wheeler et al., 2007) and, in turn, dissatisfaction enhances innovative behaviors (Zhou & George, 2001; see also Study 6 in the present document), we postulate that dissatisfaction mediates the effect of value misfit on leaders' innovative behaviors.

## Schwartz's theory of universal values

Schwartz's theory of universal values has been extensively validated in several cross-cultural settings (Schwartz, 1992, 1999; Schwartz & Bilsky, 1990). Schwartz identified ten motivationally distinct groups of values and established the dynamic relationships between them (Bardi & Schwartz, 2003; Schwartz, 1992, 2006; Schwartz & Boehnke, 2004). More precisely, the theory describes a theoretical structure of values based on the compatible or antagonistic relations between them (see Figure 15). Thus, the ten groups of values can be organized around two bi-polar dimensions. A first bi-polar dimension opposes Self-transcendence that comprises the values of Universalism and Benevolence, to Self-enhancement that encompasses the values of Power and Achievement. The second bi-polar dimension opposes Openness to change, comprising the values of Self-direction, Stimulation and Hedonism, to Conservation that covers the values of Conformity, Tradition and Security. These values are organized in a circle that constitutes a continuum of different sources of motivation. On this circle, the closer values are, the more they entail similar sources of motivation even though they belong to different dimensions (e.g., Self-direction and

Universalism). Conversely, the farthest values are, the more they entail antagonistic sources of motivation (e.g., Self-direction and Security). Finally, each group of values entails numerous values, leading to 50 single values distributed across the ten group values. For example, the group value Self-direction encompasses the values Freedom, Creativity, Independent, Curious...

*Figure 15.* Theoretical structure of value types and dimensions. Reprinted from Sagiv and Schwartz (1995, p.439).



Motivation, as conceived in Schwartz' theory, can refer to a specific type called identified motivation (Kasof et al., 2007). Identified motivation concerns the relative importance that an individual gives to specific values and the integration of such importance as a component of his self (Burton, Lydon, D'Alessandro, & Koestner, 2006; Deci & Ryan, 2000). Identified motivation is conceived as a self-determined extrinsic motivation (Deci & Ryan, 2000). It is assumed that individuals are motivated to adopt specific behaviors because such actions will lead to consequences that are in adequacy with the values they regard as especially important. Unlike intrinsic motivation, identified motivation drives individuals to engage in potentially costly behaviors, provided that these behaviors are necessary in order to respect or enact their

values (Koestner & Losier, 2002). Intrinsic motivation entails adopting innovative behaviors as an end in itself. Thus, leaders can be intrinsically motivated to adopt innovative behaviors when they give importance to values of openness to change (Kasof et al., 2007). Identified motivation entails that leaders adopt behaviors as a means to achieve an objective that corresponds to one's values (Kasof, et al., 2007). In such a case, innovative behaviors are part of the process, not the end in itself. Thus, every value can be a trigger of innovative behaviors if leaders have a high identified motivation and as long as it enables them to find better practices to enact their values.

## From value incongruence to leaders' innovative behaviors

The main objective of the present study consists of investigating how a misfit between individual and organizational values that guide managerial practices can predict innovative behaviors. In this approach, leaders' adoption of innovative behaviors does not necessarily originate from the importance they give to specific values as guiding principles of their managerial practices but arises from a necessity to regulate their dissatisfaction with managerial practices that are prescribed by their organization (Vogel et al., 2016; Zhou & George, 2001). In such cases, we postulate that the more leaders and organizations give differential importance to specific values that guide managerial practices, the more leaders will be dissatisfied by the practices that the organizations expect him/her to adopt.

Hypothesis 1. Leaders' dissatisfaction with prescribed managerial practices increases as the discrepancy between their values and those of their organization increases.

Moreover, as stated previously, employees who experience dissatisfaction can react by adopting passive (loyalty or neglect) or active (exit or voice) behaviors (Rusbult et al., 1988; Whitey & Cooper, 1989). Thus, dissatisfaction can activate leaders' motivation to engage in active behaviors. Such motivation has been tackled by the concepts of readiness for organizational change (Morrison & Phelps, 1999). In the present study, we contextualized the change as the adjustment regarding the practices that are prescribed by the organization in order for leaders to adopt practices that are more respectful of their values. At the individual level, readiness for change is conceived as "a demonstrable need for change, a sense of one's ability to successfully accomplish change (self-efficacy)" (Cunningham et al., 2002, p. 377). In this way, readiness for change can be perceived as a specific type of self-efficacy that focuses on the ability to modify actively the current situation. Spector (1989) argued that readiness for change emerges when employees are dissatisfied with the current situation.



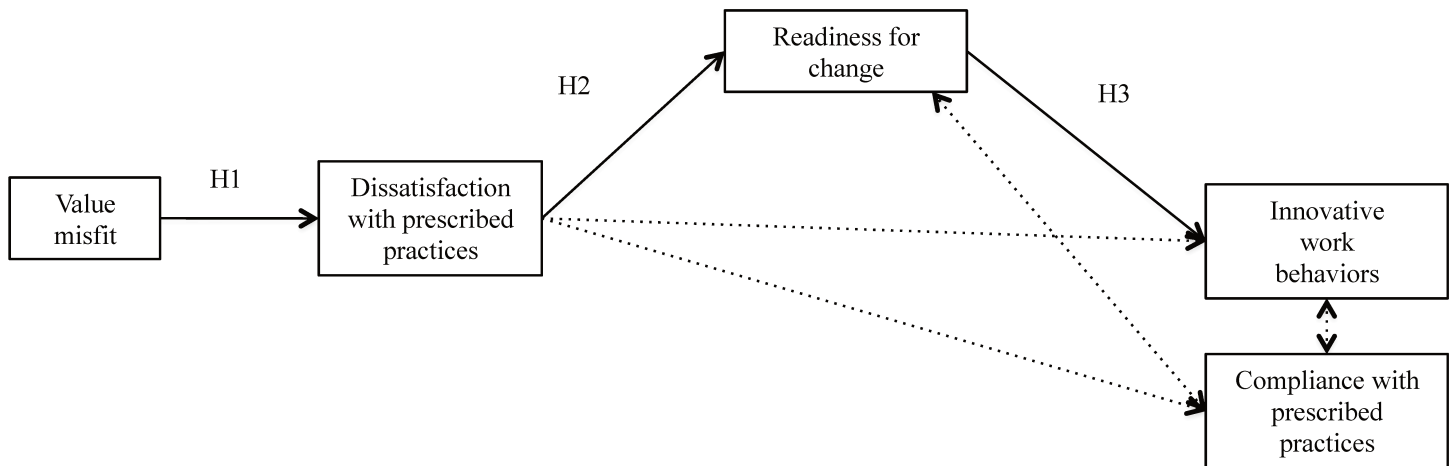
Thus, we postulate that dissatisfaction with prescribed managerial practices increases leaders' readiness to step away from these practices. Then, once leaders perceive themselves as able to improve their working conditions, we postulate that they will engage to a greater extent in innovative behaviors. We operationalized innovative behaviors as the generation and implementation of new practices that differ from the prescribed practices in the organization and that allow leaders to enact according to their values. By doing so, we seek to capture innovative behaviors that are contextualized (Ettlie & O'Keefe, 1982) and that result from an identified motivation. Consequently:

Hypothesis 2. Leaders' dissatisfaction predicts their readiness for organizational change.

Hypothesis 3. Leaders' readiness for organizational change predicts their adoption of innovative behaviors.

To provide additional support for our conception, we consider that there could be an alternative hypothesis to the adoption of innovative behaviors as a result of leaders' dissatisfaction with managerial practices. Indeed, we stated previously that dissatisfaction could lead to passive behaviors, such as compliance (Rusbult et al., 1988). Thus, an alternative hypothesis should be that, as a result of values misfit, dissatisfaction leads to compliance with practices prescribed by the organization. On the other hand, if leaders are satisfied with their job, as a result of an SN fit, there is a greater chance that they will apply prescribed practices because they enact their personal values. Thus, the theoretical model that we will test in the present study takes also into account the potential outcome of leaders' compliance with prescribed management practices. We expect that leaders' dissatisfaction will predict negatively their compliance with prescribed practices. Such result would allow a firm conclusion that when dissatisfaction emerges from a misfit between individual and organizational values, it encourages predominantly an active response to improve the incongruent situation. Compliance with prescribed practices is not subject to specific hypotheses. However, its causal relation from dissatisfaction, as well as its covariances with readiness for change and innovative behaviors will be included in the theoretical model. The theoretical model that encompasses hypotheses 1 to 4 is presented in figure 16.

Figure 16. Theoretical model explaining the effects of leaders and organization's values misfit



## Method

### Participants

In order to test the theoretical model, we created an online questionnaire on Limesurvey<sup>®</sup> aiming to assess the different variables and collect sociodemographic data. French managers have completed the questionnaire between February and May 2017. They were contacted on internal and external social networks, and invited to click on a link to complete the questionnaire. The message accompanying the link stipulated the anonymity of the respondents and the confidentiality of their answers. Five hundred and four managers started the questionnaire, among which 207 completed it (41% of completion). Respondents were working in different companies from diverse sectors (in decreasing order of frequency: Industry ( $N = 36$ ), banking and financial ( $N = 15$ ), technology ( $N = 15$ ), distribution ( $N = 14$ ), etc.) and diverse departments (in decreasing order of frequency: Customer services, ( $N = 29$ ), Research and development ( $N = 23$ ), Human resources ( $N = 22$ ), Production ( $N = 22$ ), etc.). Demographic characteristics for the sample of 207 managers are presented in Table 18.

Table 18. Descriptive statistics [mean  $\pm$  SD or n (%)] for the final sample

Variable	Participants (N = 207)
Sex (Male)	106(51.2)
Age (years)	41 $\pm$ 9.5
Position <sup>†</sup>	
Line manager	99(48)
Project manager	32(15.5)
Senior manager	67(32.4)
Experience in current organization (years)	14.1 $\pm$ 56.7
Managerial experience (years)	14.2 $\pm$ 30.7
Number of collaborators	52 $\pm$ 271.9

<sup>†</sup> 24 respondents did not indicate their position.

## Measures

### Values

Schwartz (1992) developed a questionnaire composed of 57 values that reflect the content and structure of his theory. This questionnaire aims to assess the extent to which different individuals perceive the values as personal principles that guide their lives. This questionnaire has been subject to numerous translations, including a French one, and has demonstrated a relatively robust structure through samples from different cultures (Schwartz, 1992; Schwartz & Boehnke, 2004). However, because of the relatively unsuitable content of certain values in the organizational context, Wils, Luncasu, and Waxin (2007) created a French version of Schwartz's questionnaire called "Values at work". They removed 16 values that did not suit the professional context and slightly modified the instructions. In the present study, we used Wils et al.'s (2007) "Values at work" questionnaire in order to assess both personal and organizational values.

As in Study 6, PE fit was assessed indirectly. Two commensurate measures were created. Thus, participants were asked to rate twice the list of 41 values. Instructions for the personal values scale were: "Your managerial practices can be guided by values that are important to you. We ask you to evaluate the importance you give personally to each value of the list presented below." Participants rated each value on a nine-point scale, as proposed by Schwartz (1992) and Wils et al. (2007): opposed to my values (-1), not important (0), (unlabeled; 1, 2), important (3), (unlabeled; 4, 5), very important (6), of supreme importance (7). Instructions for the organizational values scale were the following: "The managerial

practices that your company (e.g., your managers, superiors) asks you to implement can be guided by certain values. From the list of values that is presented to you again, we ask you to evaluate their importance, as you perceive it. As a guiding principle of practices that my company prescribes me, this value is ... in opposition (-1), not important (O), (unlabeled; 1, 2), important (3), (unlabeled; 4,5), very important (6), of supreme importance (7).”

To ensure that we retrieved Wils et al.’s (2007) circular and dimensional structure of values, we conducted non-metric ordinal multidimensional scalings (MDS) respectively on the two scales. This procedure consists in calculating pairwise distances among items. It allows representing in a geometric space the similarities between the variables (Davison, 1983; Dillon, Dillon, & Goldstein, 1984; Holland, 2008). Distances between items were calculated based on the Kendall’s tau distance (Kendall, 1938; see also Tournois & Dickes, 1993). First, we conducted two MDS representing respectively personal and organizational values (see Appendix 5.5). Representations were characterized by acceptable indexes of fit (for Personal values: Stress-1 = .23; for Organizational values: Stress-1 = .22) for matrices of order 41 (Spence & Ogilvie, 1973).

However, in the two MDS, several values were not located close to the values belonging to the same category, which hindered the possibility to aggregate them with the values of their group in order to create a score. Because our aim was to create commensurate measures representing the different group dimensions, we removed every value that was not located on its theoretical dimension (9 values in total) in one of the two MDS. Two new MDS were conducted on the two scales of 32 values (see Appendix 5.6). Representations were still characterized by acceptable indexes of fit (for Personal values: Stress-1 = .19, for Organizational values: Stress-1 = .19) for matrices of order 32 (Spence & Ogilvie, 1973). From these new representations, we were able to retrieve two similar representations of organizational and personal values and to identify items that belong to their dimension and group value (see Appendix 5.6). Only four items were still distant from their theoretical group value and were subsequently removed. From the 28 values that complied with Wils et al.’s (2007) structure, we created scores representing the different group values. For the ten theoretical group values, three could not be included in further analyses (Tradition, Security and Hedonism) because their related items were scattered on the geometric representations in the MDS for Personal and/or Organizational values. Finally, seven value scores were created for personal values, as well as their commensurate scores for organizational values. Group values included for further analyses are: Power ( $N = 6$  values), Achievement ( $N = 6$ ),

Stimulation ( $N = 3$ ), Self-direction ( $N = 3$ ), Universalism ( $N = 4$ ), Benevolence ( $N = 3$ ) and Conformity ( $N = 3$ ).

## Dissatisfaction toward prescribed managerial practices

A new scale, composed of 9 items, was constructed to assess dissatisfaction toward prescribed managerial practices (see Appendix 5.7.). In order to ease respondents' participation, items were positively formulated and started by "I am satisfied with..." In order to present various aspects of managerial activity toward which leaders can express different levels of dissatisfaction, the items covered several dimensions of Yukl's (2012) taxonomy of managerial behaviors. Based on a review of the literature, this taxonomy presents a relatively exhaustive list of managerial activities. Only behaviors that were likely to be adopted at different levels of management have been included, such as supervision (e.g., "... the way my hierarchy wants me to lead the work of my team"), planning (e.g., "... the managerial actions required by my hierarchy to plan the tasks of my team"), or support for employees (e.g., "... the way my hierarchy asks me to support my collaborators"). In this way, the scale is adapted to the different levels of management positions. Participants were asked to rate their level of agreement with the various statements by using a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Participants' scores were reversed afterwards in order to measure dissatisfaction, in the sense of an absence of satisfaction (Locke, 1969, 1976). Although it incorporates various aspects of Yukl's taxonomy (2012), a PCA ( $KMO = .95$ , Bartlett's test:  $\chi^2(36) = 1175.57$ ,  $p < .001$ ) using a parallel analysis (Horn, 1965) identified a single factor explaining 68.3 % of total variance. Factor loadings were comprised between .73 and .86. Consequently, the nine items were retained for further analysis.

## Readiness for organizational change

To assess this concept, we used a scale adapted from the one developed by Cunningham, Woodward, Shannon, MacIntosh, Lendrum, Rosenbloom & Brown (2002). These authors conceived the concept of readiness for organizational change as a five-step process from the identification of a need for change to the establishment and maintenance of change. However, we did not select items reflecting the last stage called "Maintenance of organizational change" as it was not relevant for the present study. Thus, only five items were translated into French and their content were contextualized to managerial activity (see Appendix 5.7.). A sample

item is “I’ve been thinking that I might want to help change something about the managerial practices that are used in my organization”. Participants were asked to rate their level of agreement for the various statements by using a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). A CFA was conducted to verify that the five items loaded on a unique construct. The analysis showed unacceptable fit with the data ( $\chi^2 = 170.6$ ,  $df = 5$ ,  $p < .05$ , CFI = .57; NNFI = .14; RMSEA = .40; SRMR = .21). Therefore, a PCA was conducted (KMO = .64, Bartlett’s test:  $\chi^2(10) = 359.15$ ,  $p < .001$ ). A parallel analysis (Horn, 1965) led to identify two dimensions to retain, explaining respectively 42% and 36% of the total variance. A promax rotation showed that the two first items loaded on the second factor and the three last items loaded on the first factor. This structure differs from the results of Cunningham et al. (2002). However, the authors reported only a Cronbach’s alpha that did not demonstrate good reliability ( $\alpha = .63$ ). In fact, the two dimensional structure appears to fit the theoretical contribution on which was based the scale development (Prochaska et al., 1994). Indeed, the two first items, loading on the second dimensions assess the precontemplative stage of change. This stage is theoretically a preliminary phase in which individuals do not yet feel the need for change. Cunningham et al. (2002) advised to reverse the two items in order to assess the premise of perceived need for change. Then, the three last items assess the following stages labeled contemplative, preparatory and action. Consequently, two composite scores were created to reflect the two phases of readiness for change. The two items addressing the preliminary stage of readiness for change had a strong and significant correlation ( $r = .76$ ) and the three items composing the subsequent stages showed an acceptable level of reliability ( $\alpha = .76$ ). Moreover, as the second phase necessarily emerges once the first phase has been completed, we postulate that there is a causal relationship between the two phases. Thus, we will attempt to demonstrate that dissatisfaction toward prescribed practices increase managers’ perception of the change necessity which in turn increases their readiness to act in order for changes to happen. These two steps of readiness for change are then hypothesized to increase leaders’ adoption of innovative behaviors in order to step away from the prescribed managerial practices. We will subsequently use the terms Perceived need for change and Readiness to act for change.

### Compliance with prescribed managerial practices

A five-item scale was developed specifically for this study (see Appendix 5.7.). According to the definition given by Cialdini and Goldstein (2004), compliance refers to “a particular kind of response - acquiescence - to a particular kind of communication - a request” (p.592). From

this definition, we constructed items that present some nuances in the degree of acquiescence with prescribed practices (by using verbs such as *act*, *support*, *respect*). Sample items are "I support the way my hierarchy recommends me to organize the work of my team members", "I act in agreement with the management practices prescribed by my hierarchy". Participants rated their degree of agreement on a 7-point Likert scale (1- Totally disagree, 7- Totally agree). A PCA was conducted (KMO = .89, Bartlett's test:  $\chi^2(10) = 667.94$ ,  $p < .001$ ). A parallel analysis led to identify a single factor, explaining 77% of the total variance. Item loadings ranged between .85 and .89. Consequently, every item was kept for further analyses.

### Innovative work behaviors

Innovative behaviors are, in theory, the result of different steps that compose the creativity and innovation process. Regarding the objective of the present study, it would have been of great interest to be able to explore how value misfit can affect differently specific types of innovative behaviors. We had the same interest in Study 6, and we had therefore selected one of the rare scales supposed to present a multidimensional structure (Dorenbosch et al., 2005). However, psychometric analyses led to conclude in favor of a one-dimensional structure. Thus, for the present study, we attempted to create a scale that would assess the different steps of the innovative process. First, a content analysis of published research makes it possible to identify 17 different scales that measure behaviors likely to be involved in the creative and innovative process (see Appendix 1.2.). Second, two judges classified the 177 items that compose those scales according to the step of the process they assessed. Judges were asked to allocate each item to one of the five steps of the process. As presented in the introduction of this document, the identified steps were Problem understanding, Idea generation, Idea evaluation, Idea promotion and Idea implementation. Items corresponding to the first step were identified as evoking either information searching or information encoding in relation to the problem (Mumford et al., 1996). Nevertheless, because the present study investigate specifically how an identified problem (a value misfit) can lead to innovative behaviors, the step of problem identification was not included as part of the innovative work behaviors questionnaire. Third, items that were classified identically by the two judges for the other phases of the process were translated into French. Then, 5 items were selected for each step of the process depending on the quality of their content. Finally, the 25 selected items were adapted to include the notion of managerial practices. Participants were asked to rate their level of agreement on the 25 statements using a 7-point Likert scale ranging from 1- Totally disagree to 7- Totally agree. Despite our efforts to construct a multidimensional scale,

a PCA (KMO = .91, Bartlett's test:  $\chi^2(300) = 2108.36$ ,  $p < .001$ ) using a parallel analysis revealed the existence of a unique factor that explains 37% of the total variance. Among the 25 items, 8 had loadings on the first dimension that was inferior to .60 and were consequently removed. A confirmatory factor analysis revealed an acceptable fit between our data and a unidimensional model for the 17 remaining items ( $\chi^2 = 201.27$ ,  $df = 110$ ,  $p < .05$ , CFI = .95; NNFI = .94; RMSEA = .06; SRMR = .05). Four items that showed standardized factor loadings inferior to .60 were not retained for further analysis. Thus, we retained thirteen items to compose a unidimensional scale of innovative behaviors. Among these items, two were supposed to assess the phase of idea generation, two represent the phase of idea evaluation, five represent the phase of idea promotion and four items represent the phase of idea implementation.

## Results

### Preliminary analyses

Data were screened for assumptions of linearity, normality, homogeneity and multicollinearity (Tabachnik & Fidell, 2001). Five respondents were identified through Mahalanobis distance as multivariate outliers, and were removed from the final sample ( $\chi^2(20) = 43.82$ ,  $p < .001$ ). Moreover, because personal values are supposed to correspond to a circular model, and because of the specific instructions to participants to begin by assessing respectively the least and the most important values, we expect a minimum of heterogeneity in respondents' answers on the personal values scale. We considered standard deviations superior to 1 as an arbitrary criterion for the minimum acceptable level of heterogeneity. Following this procedure, eleven respondents were excluded because their personal values reflected a quasi-constant response pattern. The sample used for the final analyses is composed of 191 managers.

### Measurement model

We conducted a series of CFA to test the reliability and validity of the scales assessing the five constructs: dissatisfaction toward prescribed practices, perceived need for change, readiness to act for change, compliance with prescribed practices and innovative behaviors. The first model included every item selected after PCA and CFA analyses conducted for every scale independently and postulated five latent variables. Results for this first model did



not show an acceptable fit with the data ( $\chi^2 = 1011.55$ ,  $df = 551$ ,  $p < .05$ ; CFI = .89; NNFI = .88; RMSEA = .07; SRMR = .09). We verified if the model could be improved by fixing correlated errors between items or allowing items to load on another latent construct. Based on the suggested modification indices and the standardized expected parameter change (Rosseel, 2012; Whittaker, 2012), allowing an item of compliance to load on the construct of dissatisfaction would have improved the model. Consequently, we removed this item that questioned the discriminant validity of the scale of compliance. Nevertheless, we allowed several correlated errors between items of the scale of innovative behaviors. The second version of the model shows a better fit with the data ( $\chi^2 = 887.55$ ,  $df = 516$ ,  $p < .05$ ; CFI = .91; NNFI = .90; RMSEA = .06; SRMR = .08). We computed the means, standard deviations and correlations among the variables that are presented in Table 19. To investigate the reliability and validity of the five scales, we estimated the factors loading for each item on their respective construct, and calculated the average variance extracted (AVE) and composite reliabilities (CR). These coefficients were estimated using a maximum likelihood technique (Fornell & Larcker, 1981). Moreover, as recommended by Edwards and Cable (2009), the reliability of constructs of Values (e.g., as assessed by Schwartz, 1992; and Wils et al., 2007) should be estimated by coefficient omega rather than Cronbach's alphas (Smith, 1974). Compared to Cronbach's alpha, omega relaxes the assumption of tau equivalence that can be violated in composite scores representing personal and organizational values. As advised by Edwards and Cable (2009), coefficients omega were estimated from McDonald's (1999) equation, that slightly differ from the Raykov's (2001) equation that should be used to estimate the composite reliabilities. Omega coefficients are presented in the diagonal of Table 19. Their estimates ranged from .66 to .99. Factor loadings, AVE and CR are presented in Appendix 5.7.

We looked first at the standardized loading coefficients for each item. One item composing the scale of innovative behaviors had a loading slightly inferior to .60 ( $\lambda = .59$ ). Other standardized coefficients from items to their factors ranged from .61 to .93. Moreover, each item loaded significantly on its underlying construct ( $p < .001$ ).

Second, the composite reliabilities (CR) ranged between .77 and .94. Such estimates are considered acceptable and confirm the reliability of our constructs (Fornell & Larcker, 1981; Peng & Lai, 2012). The average variances extracted were all above the conventional threshold of .50 (Fornell & Larcker, 1981) with the exception of the scale of innovative behaviors (.48). Even though this last scale shows a weak convergent validity, the square root of the AVE

exceeded the correlations between innovative behaviors and the other constructs, attesting the discriminant validity of the scale (see Table 19).

Finally, as we can see on Table 19, correlations between the bi-polar dimensions Self-enhancement and Self-transcendence were close to zero. Surprisingly, correlations between Openness to change and Conformity were significant and positive. Because our hypotheses do not rely on the bipolar structure of values, this unexpected result does not prevent further analyses.

Table 19. Means, standard deviations, and correlations. Omega coefficients are presented in the diagonal.

Variable	M	SD	CR	AVE ( $\sqrt{\text{AVE}}$ )	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. P. Power	3.98	1.43			(.89)																		
2. O. Power	4.27	1.49			.46**	(.86)																	
3. P. Achievement	5.96	1.10			.57**	.35**	(.79)																
4. O. Achievement	5.79	1.26			.24**	.49**	.32**	(.86)															
5. P. Benevolence	7.05	0.86			.05	.17*	.30**	.32**	(.66)														
6. O. Benevolence	5.83	1.73			.09	.20**	.12	.48**	.28**	(.73)													
7. P. Universalism	6.03	1.22			.05	.19**	.19**	.18*	.53**	.25**	(.70)												
8. O. Universalism	4.69	1.91			.07	.14	.09	.31**	.21**	.64**	.43**	(.84)											
9. P. Stimulation	6.64	1.09			.02	.23**	.25**	.31**	.44**	.23**	.39**	.18*	(.90)										
10. O. Stimulation	5.15	1.89			.07	.27**	.04	.52**	.23**	.71**	.25**	.63**	.35**	(.82)									
11. P. Self-direction	6.36	1.18			.10	.17*	.28**	.27**	.33**	.21**	.41**	.22**	.66**	.27**	(.90)								
12. O. Self-direction	5.39	1.83			.09	.18*	.06	.38**	.15*	.53**	.26**	.59**	.29**	.72**	.28**	(.84)							
13. P. Conformity	6.27	1.14			.23**	.24**	.25**	.36**	.38**	.20**	.42**	.22**	.25**	.23**	.14	.16*	(.99)						
14. O. Conformity	6.09	1.35			.09	.30**	.15*	.46**	.31**	.44**	.25**	.32**	.29**	.40**	.21**	.29**	.46**	(.95)					
15. Dissatisfaction	3.57	1.23	.94	.62 (.79)	.07	.03	.17*	-.23**	.05	-.37**	.10	-.25**	-.03	-.34**	.03	-.29**	.04	-.14*	(.94)				
16. Compliance	5.33	1.32	.91	.72 (.85)	.09	.09	.14*	-.07	.09	-.27**	.02	-.19**	.11	-.20**	.09	-.08	.03	-.10	.54**	(.91)			
17. Perceived need for change	5.44	1.06	.87	.77 (.88)	.07	.11	.15*	.12	.08	.03	.14*	.05	.12	.08	.19*	.06	.01	-.05	-.02	.23**	(.87)		
18. Readiness to act for change	4.66	1.19	.77	.53 (.73)	-.07	-.06	-.10	.15*	-.06	.25**	-.11	.14*	-.06	.19**	-.08	.18*	.02	.20**	-.74**	-.45**	.07	(.78)	
19. IWB	5.05	0.87	.92	.48 (.69)	.10	.17*	.22**	.19**	.07	.10	.18*	.05	.28**	.11	.36**	.12	.04	.01	.04	.17*	.64**	-.05	(.92)

Note. \* indicates  $p < .05$ ; \*\* indicates  $p < .01$ . M and SD are used to represent mean and standard deviation, respectively. CR = Composite reliabilities, AVE = Average variance extractor, P = Personal value, O = Organizational value, IWB = Innovative work behaviors.

## Common method variance

We collected the present data at one time for each participant and through the same online questionnaire. Such method may imply numerous potential sources of common method biases (Podsakoff et al., 2003). Evans (1985) demonstrated that common method variance is unlikely to induce factual and interactive relations between constructs. Thus, studying indirect and moderated effects of Values fit reduces the probability of being confronted to common method variance (Edwards, 1996). However, we tried to avoid the bias of spurious relationships by using negative and positive affirmations and we conducted two analyses to identify the extent to which common method variance constitutes a problem on the present data. We conducted first a Harman one-factor test on every item that was kept, including items that constituted the measures of organizational and personal values. This factor accounted for 11.8% of the variance, which is weak and largely insufficient to explain the majority of the covariance between the variables. We conducted also a CFA loading every item on one single factor (Podsakoff et al., 2012; Podsakoff et al., 2003). Indices of fit demonstrate that such solution does not fit the data ( $\chi^2 = 11634.85$ ,  $df = 3915$ ,  $p < .05$ ; CFI = .22; NNFI = .20; RMSEA = .10; SRMR = .15). We conclude therefore that the following findings are not likely to be attributed to method variance.

## Strategy of analysis

Analyses were conducted with R statistical software (R Development Core Team, 2016) using the packages *apaTables* (Stanley, 2017), *lavaan* (Rosseel, 2012), *paran* (Dinno, 2012), *psy* (Falissard, 2012), *psych* (Revelle, 2017), *RSA* (Schönbrodt, 2016), *rsm* (Lenth, 2009), *semPlot* (Epskamp, 2017), *semTools* (Contributors, 2016) and *smacof* (de Leeuw & Mair, 2009)(de Leeuw & Mair, 2009).

The present study investigates the effect of PO fit on dissatisfaction by using polynomial regressions and response surface analyses (Edwards, 1994, 2002, 2007b; Edwards & Parry, 1993; Edwards et al., 1998; see also the section *Strategy of analysis* of Study 6 in the present document). Composite scores of personal and organizational values were centered before polynomial analyses, and dependent variables were scaled to ensure a common metric and to reduce multicollinearity effects (Aiken & West, 1991; Edwards & Cable, 2009; Shanock et al., 2010).

When polynomial regressions explained a significant part of dissatisfaction toward prescribed practices, block variables were created (Cable & Edwards, 2004; Heise, 1972; Marsden, 1982 see also the section *Strategy of analysis* of Study 6 in the present document). The predictive model was tested for each group of values separately by means of path analyses. Indirect effects were estimated using the Monte Carlo method (MacKinnon et al., 2004; Tofighi & MacKinnon, 2016).

## Testing the effect of value misfit on dissatisfaction toward prescribed practices

Polynomial regressions are expressed by the following equation:

$$D = b_0 + b_1PV + b_2OV + b_3PV^2 + b_4PV.OV + b_5OV^2 + e \quad (4)$$

where D is Dissatisfaction, PV and OV are the two predictors (respectively, personal and organizational values guiding managerial practices). Thus, the dependent variable is regressed on each of the two predictors (PV and OV), their interaction (PV.OV) and each of the squared predictors ( $PV^2$  and  $OV^2$ ). If the variance of the dependent variable explained by the regression equation ( $R^2$ ) differs significantly from zero, then the result of this regression is used to show graphically the effect of the predictors on the dependent variable.

Results for the polynomial regression analyses are presented in Table 20. Except for the Power group value, every polynomial regression explained a significant part of the variance for dissatisfaction scores. From these results, we notice that dissatisfaction is predominantly and negatively predicted by organizational values. Thus, the more leaders perceive that their organizations prescribed practices that are guided by values of any type (except for the group value Power), the more satisfaction they report.

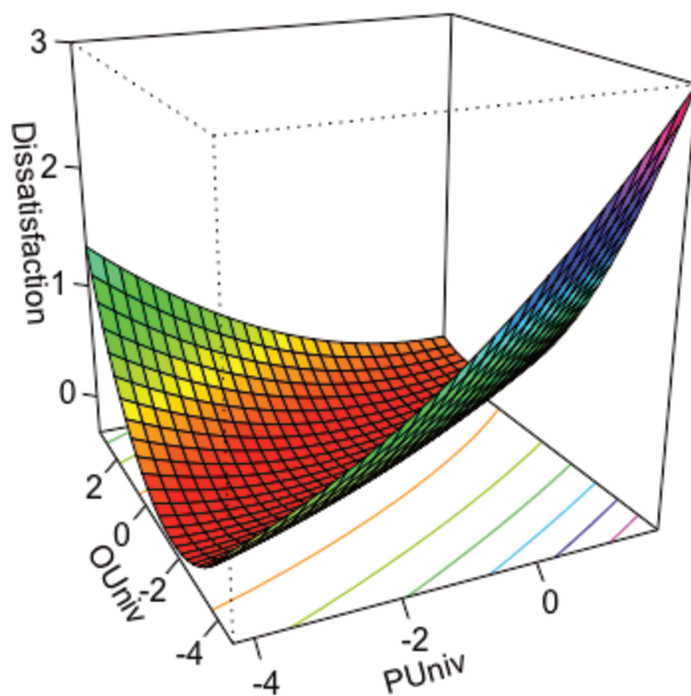
Table 20. Results for polynomial regressions expressing personal and organizational value fit effects on dissatisfaction

Values	Constant	PV	OV	PV <sup>2</sup>	PVOV	OV <sup>2</sup>	PV = OV line		PV = -OV line		R <sup>2</sup>	$\Delta R^2$	F-Tes df = 4
	b <sub>0</sub>	b <sub>1</sub>	b <sub>2</sub>	b <sub>3</sub>	b <sub>4</sub>	b <sub>5</sub>	a <sub>1</sub> : b <sub>1</sub> + b <sub>2</sub>	a <sub>2</sub> : b <sub>3</sub> +b <sub>4</sub> +b <sub>5</sub>	a <sub>3</sub> : b <sub>1</sub> - b <sub>2</sub>	a <sub>4</sub> : b <sub>3</sub> -b <sub>4</sub> +b <sub>5</sub>			
Power	.20	.09	-.01	-.05	-.18†	.12	.06	-.06	.07	.11	.04	.03	1.53
Achievement	-.01	.31***	-.34***	.07	.05	-.07	.01	.04	.55***	-.02	.13***	.13	5.12*
Stimulation	-.08	.11	-.33***	.08	-.07	.07	-.07	.02	.28*	.09	.13***	.07	6.84*
Self-direction	-.03	.14	-.31**	.03	.03	.02	-.05	.03	.29**	.01	.10**	.07	4.97*
Universalism	-.22*	.16†	-.24**	.08	-.20*	.26**	.01	.02	.26*	.18**	.17***	.05	8.79*
Benevolence	.09	.15†	-.46***	-.03	-.05	-.08	-.09	-.08	.44***	-.01	.18***	.12	9.62*
Conformity	.17†	.16*	-.32***	-.05	.01	-.20*	-.10	-.10†	.38***	-.10	.07*	.07	3.28*

Notes. PV = Personal values, OV = Organizational values. Table entries are standardized coefficients. The columns R<sup>2</sup> indicates the variance explained by the five quadratic terms. The columns  $\Delta R^2$  and F-Test correspond to the difference test for the R<sup>2</sup> values of the constrained model (PV-OV)<sup>2</sup> and the unconstrained model.

Because our interest lies in values misfit effects on dissatisfaction, hypothesis 1 is tested through the analysis of results for the line of incongruence ( $PV = -OV$  line). A significant and positive  $a_4$  signifies a general effect of incongruence (see Table 16, p. 203). The estimate  $a_4$  is significant only for the group of values Universalism. As it is positive for these values, it indicates that the response surface represents a convex curve. Such curve illustrates that dissatisfaction increases as leaders give differential importance to the value Universalism as compared to their organization. The corresponding response surface is presented in figure 17. It shows that dissatisfaction is maximized when leaders attribute more importance to universalism than their organization. However, dissatisfaction increases also, but to a lesser extent, as organizations attribute more importance to universalism than leaders.

*Figure 17.* Estimated surface related PO value Universalism fit on dissatisfaction



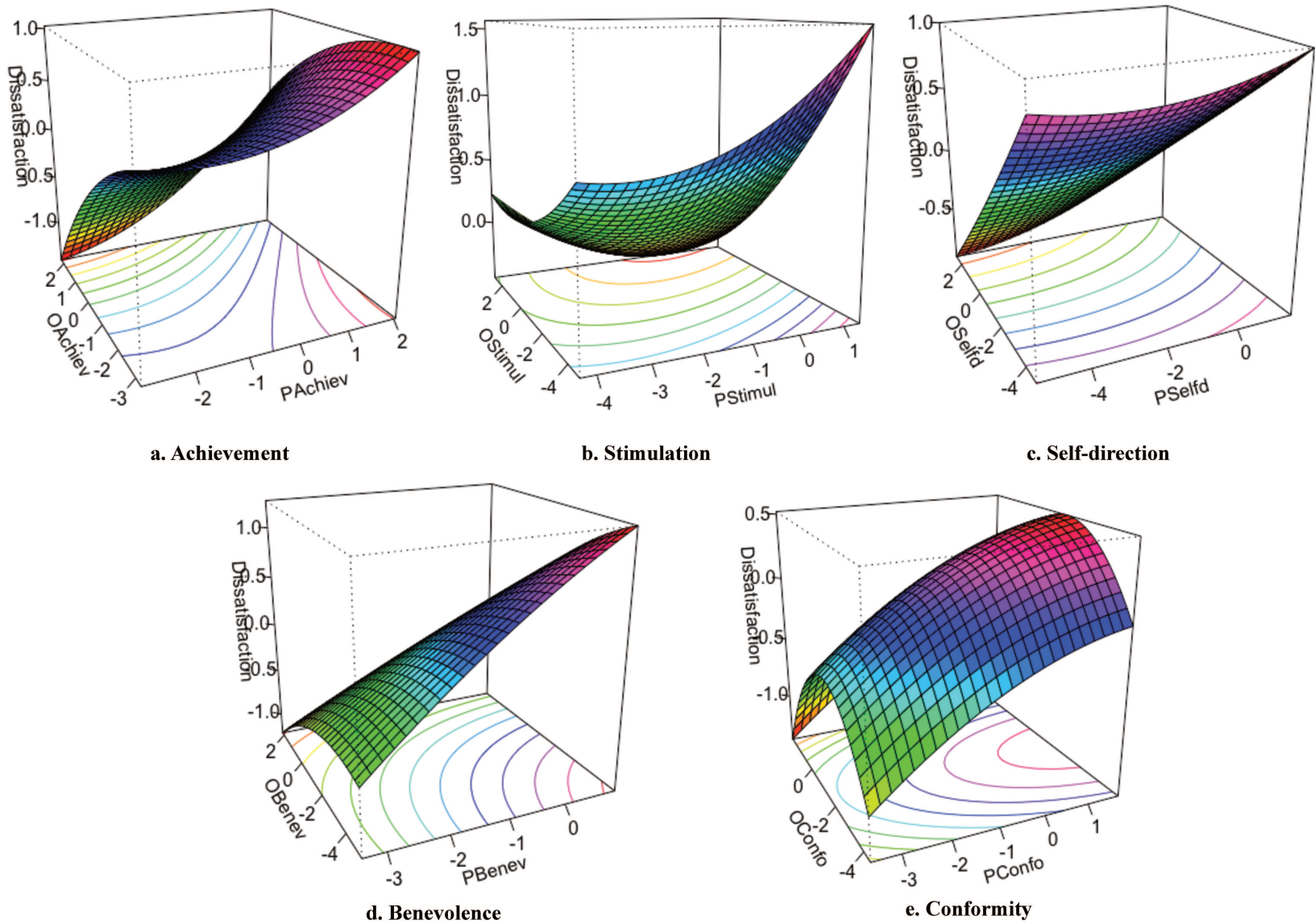
The fact that coefficients  $a_4$  are not significant for the other values, does not necessarily imply an absence of a misfit effect. Indeed,  $a_4$  indicates that there is a general effect of incongruence on dissatisfaction, whatever the sense of this incongruence (either personal value exceeds organizational value or the opposite). However, a significant  $a_3$  signifies that the ridge of the surface deviates significantly from the congruence line, meaning that dissatisfaction is maximized when organizational and personal values differ in one or the other sense. Positive and significant  $a_3$  are found for several group values: Achievement, Stimulation, Self-

direction, Benevolence and Conformity. This indicates that dissatisfaction increases as individuals attribute more importance to such values than their organization. Thus, for this 5 group of values, misfit effects are found only when personal values exceed organizational values. The corresponding response surfaces are presented respectively in figure 18.a, b c, d and e. Consequently, hypothesis 1 is supported for every group of values except for Power.

As we can see on the figure 18.c that depicts the misfit effect for the group value Self-direction, leaders are the most dissatisfied when organization do not give importance to these values and this effect is almost independent from the importance they personally assigned to them. Moreover, the group value Conformity (figure 18.e) shows a slightly different effect on dissatisfaction than the other values. Indeed, dissatisfaction seems to be maximized for leaders that attribute importance to Conformity values (such as courtesy, discipline and obedience), and perceive that their organization does not emphasize nor opposed these values. Misfit effects regarding the other group of values (Achievement, Stimulation and Benevolence) are represented by a quasi-linear relationship, where dissatisfaction increases as incongruence increases in the sense the personal values exceed organizational values.



Figure 18. Estimated surfaces related PO values fit on dissatisfaction



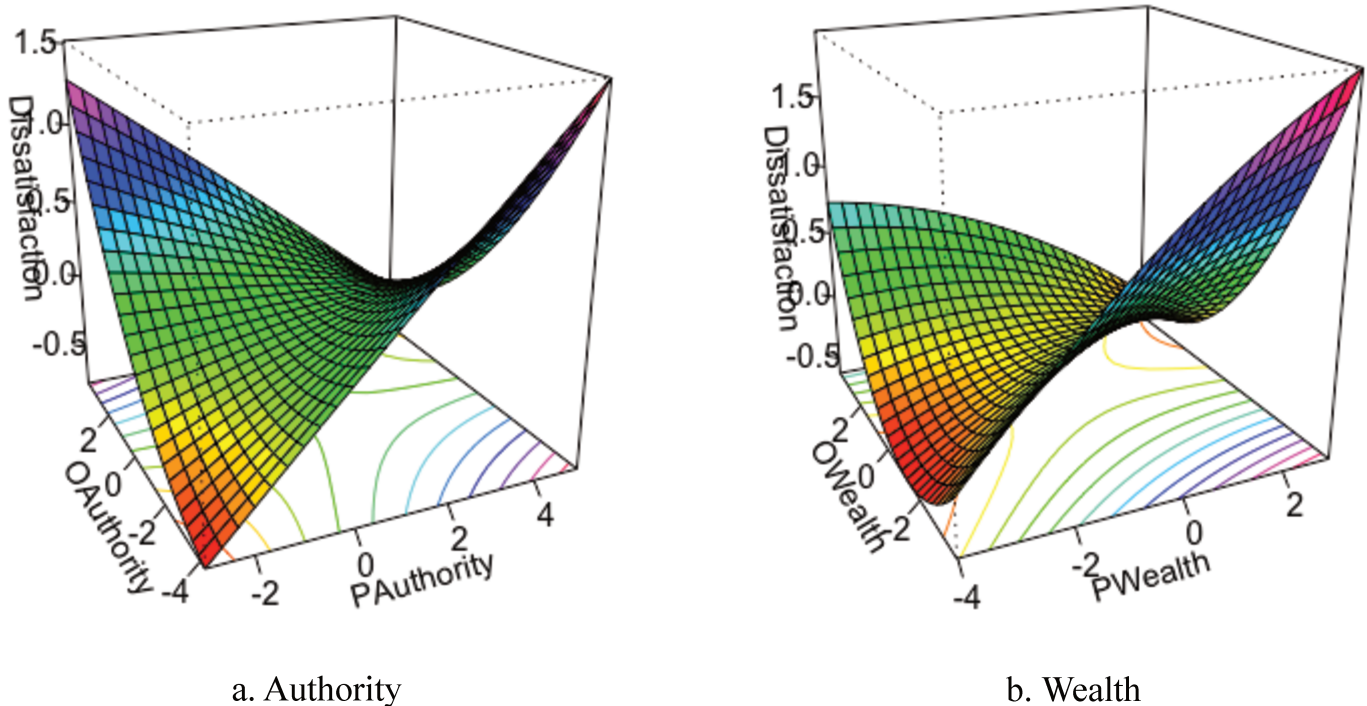
## Complementary analysis

Power has been recognized as a central value regarding management practices (French, Raven, & Cartwright, 1959; Peiró & Meliá, 2003; Raven, 1993) and has been previously studied as an antecedent of management innovation (Kunz & Linder, 2013). In view of the recent emphasis on liberating (Getz, 2009), “laissez-faire” (Bass, 1990), or empowering leadership (Zhang & Bartol, 2010) development, we believe that power is one of the more questioned values when applied to management practices. Thus, we wanted to investigate further the effect of misfit regarding the power group value on dissatisfaction. Moreover, even though the six values that theoretically composed the group value Power were acceptably positioned in the multidimensional scaling representations, 2 subgroups of three values can be identified (see Appendix 5.6.). The first subgroup is composed of the values *Social power* (V1), *Hierarchical authority* (V5) and *Preserving my public image* (V6). This subgroup entails values that emphasize leaders’ need to incarnate authority and dominance. The second subgroup is composed of the values *Material comfort* (V2), *Decent salary* (V3) and *Social recognition* (V4). This subgroup is more related to wealth and could emphasize the leaders’ need to ensure decent working conditions for the team. Thus, the first subgroup consists more certainly of values that are actually questioned regarding managerial practices in organizations.

To further our analysis on the values composing the group Power, we created composite scores for personal needs and organizational values, and for the two values subgroups that we decided to label respectively Authority (*Social power*, *Hierarchical authority* and *Preserving my public image*) and Wealth (*Material comfort*, *Decent salary* and *Social recognition*). These four scores were consistent ( $\omega_{\text{AuthorityPersonal}} = .85$ ,  $\omega_{\text{AuthorityOrganizational}} = .84$ ,  $\omega_{\text{WealthPersonal}} = .83$ ,  $\omega_{\text{WealthOrganizational}} = .88$ ). We conducted polynomial regressions and response surface analyses for these scores and found that both Authority and Wealth predicted significantly Dissatisfaction (respectively  $R^2 = .07$ ,  $p < .05$ ; and  $R^2 = .08$ ,  $p < .01$ ). Results show that both kinds of organizational values significantly predict dissatisfaction, but with a positive effect for Authority ( $\beta = 17$ ,  $p < .05$ ) and negative one for Wealth ( $\beta = -20$ ,  $p < .05$ ). Thus, the absence of significant results for the whole group of Power values can be explained by the fact the two subgroups of values have opposite effects on dissatisfaction. In addition, it should be noted that organizational values of Authority is the only organizational value that predicts positively dissatisfaction. Thus, leaders are more satisfied when the organization does not emphasize authority as a value that should guide managerial practices. The analyses of the

lines of incongruence demonstrated that Authority had also a misfit effect on dissatisfaction ( $a_4 = .09, p < .05$ ; and  $a_3 = -.06, p > .05$ ). Results indicate that leaders are more dissatisfied when they disagree with their organization regarding the importance of the Authority values. The sense of disagreement does not affect the level of dissatisfaction as we can see on figure 18a. Regarding the Wealth subgroup of values, figure 19b presents a convex shape on the line of incongruence (PV = -OV) indicating in the sense that dissatisfaction increases as organizational and personal values diverge. However, neither  $a_4$  nor  $a_3$  were significant ( $a_4 = .10, p > .05$ ; and  $a_3 = .16, p < .1$ ). Thus, hypothesis 1 is supported for the subgroup Authority but rejected for the subgroup Wealth. In summary, dissatisfaction was found to result from a misfit for the group values Achievement, Stimulation, Self-direction, Universalism, Benevolence, Conformity and the subgroup Authority. Thus, for these group values, we tested the subsequent effects of misfit and dissatisfaction on readiness for change and innovative behaviors.

Figure 19. Estimated surfaces related PO value Authority and Wealth fit on dissatisfaction



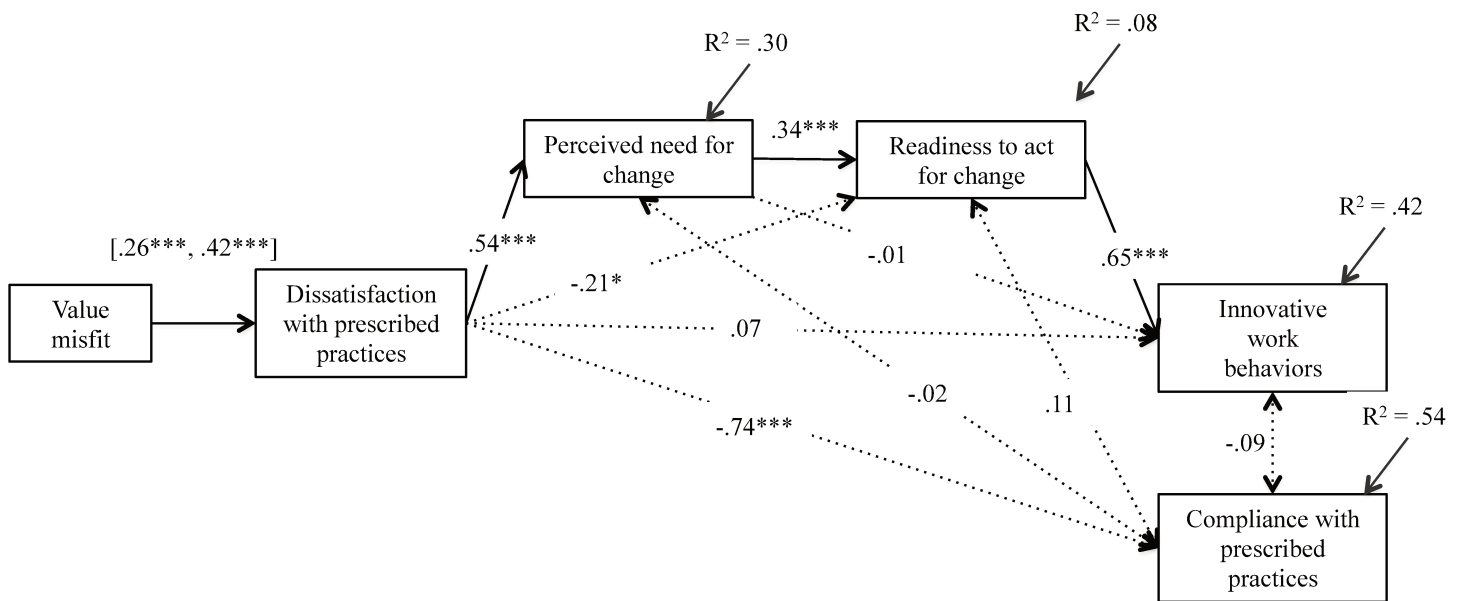
## Theoretical model testing

To obtain an estimate of the fit effects on dissatisfaction, block variables were created for group values that demonstrated a misfit effect on dissatisfaction: Achievement, Stimulation, Self-direction, Universalism, Benevolence, Conformity and the subgroup Authority. A block

variable is constructed by weighting each of the five terms entered in the regression by their related unstandardized coefficients ( $b_1$ ,  $b_2$ ,  $b_3$ ,  $b_4$  and  $b_5$ ) and then summing the five terms:  $PV$ ,  $OV$ ,  $PV^2$ ,  $PVOV$ , and  $OV^2$  (Cable & Edwards, 2004; Heise, 1972; Igra, 1979; Marsden, 1982). We tested seven different theoretical models by entering the block variables in path analyses (Heise, 1972). Compared to the model depicted in figure 16, the variable Readiness for change is conceived as two sequential steps: perceived need for change and readiness to act for change. Thus, in the tested models value misfit predicts dissatisfaction toward prescribed practices that in turn predict the perceived need for change, that increase managers' readiness to act for change, finally leading to increase innovative behaviors. Compliance was also entered in the model as a potential outcome of dissatisfaction. These models took respectively each of the misfit effects of values, represented by the block variables, as the independent variable. The chi-square value, the Standardized Root Mean Square Residual (SRMR; Bentler, 1995), and the Root Mean Square Error of Approximation (RMSEA) were considered as indices of fit (Bryan, Schmiede, & Broaddus, 2007; Hu & Bentler, 1999). For each path analysis, indices of fit were acceptable. Chi-square values ranged between .55 and 6.86 ( $df = 4$ ,  $p > .05$ ), the RSMEA values ranged between .01 and .06, the SRMR values ranged between .01 and .03, allowing us to test the different hypotheses and the strength of indirect effects.

Results for the theoretical model testing are presented in Figure 20. Estimates of the direct effects of PO value misfit on dissatisfaction are reported in Table 21. The indirect effects of PO value misfit on perceived need for change, readiness to act for change and innovative work behaviors are reported in Table 22 for each group value. Estimates of the indirect effects did not vary across the group values, only the 95% confidence intervals were slightly different. The more leaders are dissatisfied toward the prescribed managerial practices, the more they perceive a need to change those practices in the organization ( $\beta = .54$ ,  $p < .001$ ). Indirect effects of PO value misfit on readiness for organizational change through dissatisfaction were positive and significant ( $b = .54$ , see Table 22 for specific 95% IC). Therefore, leaders experiencing misfit are less satisfied with the practices that their organization prescribes and consequently perceive to a greater extent a need for change.

Figure 20. Theoretical model testing the effects of leaders and organization's values misfit



Notes. Effects of value misfit on dissatisfaction ranged from .26 to .42. Dotted arrows indicate effects that were taken into account in the model but that do not answer any hypothesis.

Perceived need for change predicts positively and significantly leaders' readiness to act for change ( $\beta = .34$ ,  $p < .001$ ). Dissatisfaction toward prescribed practices predicted negatively leaders' readiness to act for change ( $\beta = -.21$ ,  $p < .05$ ). Indirect effects of PO value misfit through dissatisfaction on readiness to act for change were negative and significant ( $b = -.21$ , see Table 22 for specific 95% IC). Such indirect effects suggest that when misfit is experienced for every value, leaders become disempowered about changing managerial practices. However, indirect effects of PO value misfit on sense of readiness to act for change were significant and positive when we added the mediating effect of perceived need for change ( $b = .19$ , see Table 22 for specific 95% IC). Thus, because PO value misfit leads to dissatisfaction, which consequently increases the perceived need for change, the effect of PO value misfit is found to be significant and positive on leaders' readiness to act for change. These overall results support our second hypothesis.

Table 21. Direct effects of PO value misfit on dissatisfaction.

	Achievement	Stimulation	Self-direction	Universalism	Benevolence	Conformity	Authority
Direct effect: PO misfit → dissatisfaction							
Standardized estimates ( $\beta$ )	.36***	.36***	.31***	.41***	.42***	.26***	.27***
Coefficient of determination ( $R^2$ )	.13	.13	.10	.17	.18	.07	.07

Notes. PO = Person-Organization, \*\*\*  $p < .001$ .

Table 22. Indirect effects of PO value misfit on readiness for change, sense of responsibility toward change and innovative work behaviors through dissatisfaction.

	<i>b</i>	Achievement	Stimulation	Self-direction	Universalism	Benevolence	Conformity	Authority
Indirect effects:								
PO misfit → dissatisfaction → PNC	.54	[.32, .79]	[.32, .79]	[.30, .82]	[.35, .77]	[.35, .76]	[.24, .87]	[.26, .86]
PO misfit → dissatisfaction → RAC	-.21	[-.41, -.04]	[-.41, -.04]	[-.42, -.04]	[-.40, -.04]	[-.40, -.04]	[-.43, -.04]	[-.44, -.04]
PO misfit → dissatisfaction → PNC → RAC	.19	[.08, .32]	[.08, .32]	[.08, .33]	[.08, .31]	[.09, .31]	[.07, .35]	[.07, .34]
PO misfit → dissatisfaction → IWB	.06	[-.07, .21]	[-.07, .21]	[-.07, .21]	[-.06, .21]	[-.07, .21]	[-.06, .22]	[-.06, .22]
PO misfit → dissatisfaction → PNC → IWB	-.01	[-.08, .07]	[-.09, .07]	[-.09, .07]	[-.08, .07]	[-.08, .07]	[-.09, .07]	[-.09, .07]
PO misfit → dissatisfaction → RAC → IWB	-.13	[-.27, -.03]	[-.27, -.03]	[-.28, -.03]	[-.26, -.03]	[-.26, -.03]	[-.28, -.03]	[-.28, -.03]
PO misfit → dissatisfaction → PNC → RAC → IWB	.12	[.05, .21]	[.05, .21]	[.05, .22]	[.05, .21]	[.05, .21]	[.04, .23]	[.04, .23]

Notes. *b* = unstandardized estimates of the indirect effects. Values in column 3 to 9 are the specific 95% confidence interval. PO = Person-Organization, PNC = Perceived need for change, RAC = Readiness to act for change, IWB = Innovative work behaviors.

Finally, leaders' readiness to act for change predicts significantly their adoption of innovative behaviors ( $\beta = .65, p < .001$ ), supporting hypothesis 3. Indirect effect of PO value misfit on innovative work behaviors was significant and positive when the complete path was estimated ( $b = .12$ , see Table 22 for specific 95% IC). Nevertheless, it should be noted that indirect effects are negative and significant when mediated by dissatisfaction and readiness to act for organizational change only ( $b = -.13$ , see Table 22 for specific 95% IC). Moreover, we found that PO value misfit had a positive and non-significant effect on innovative work behaviors when only mediated by dissatisfaction ( $b = .07$ , see Table 22 for specific 95% IC). Thus, leaders' experiences of dissatisfaction that result from an incongruence between their personal and the organizational values guiding managerial practices can be the starting point of the innovation process, as long as it increases leaders' perception that a change in managerial practices is necessary.

The theoretical model allows testing the effect of dissatisfaction on compliance. Indeed, when leaders experience dissatisfaction, they might respond to it by passive behaviors and comply with prescribed practices that oppose their personal values. Results show that dissatisfaction had a significant and negative effect on leaders' compliance with prescribed practices ( $\beta = -.74, p < .001$ ). Thus, leaders tend to apply the organization's prescribed practices as a result of their satisfaction with the related practices, and not because they responded to dissatisfaction with passive behaviors.

## Discussion

The present results support our main hypothesis that incongruence between the values of the individual and those of his organization influence indirectly and positively the emergence of innovative behaviors. When leaders disagree with their organizations regarding the values that should guide managerial practices, leaders are dissatisfied with the prescribed managerial practices, which have for consequence to increase their readiness to step away from these prescribed practices and consequently adopt innovative behaviors in order to suggest practices that correspond to their values. These findings have different implications for leaders' creativity and innovation related research topics. We will present simultaneously these implications and the potential avenues for future research.

First, as stated by Mumford et al., (1991), creativity cannot emerge if it is not aimed to solve a specific problem. Problem identification is the starting point of most theoretical perspectives on creativity and innovation (Basadur, Gelade, & Basadur, 2014; Birkinshaw et al., 2008;

Lubart, 2001; Mumford & Connelly, 1991). Until leaders recognize an ill-defined problem that cannot be solved by existing solutions, it is unlikely that they express creativity (Birkinshaw et al., 2008; Mumford & Connelly, 1991). Despite such acknowledgement, most research studied the emergence of leaders' creative and innovative behaviors without ensuring that leaders perceive the different aspects of their job that could trigger creativity. In fact, problem identification is mostly taken into account as part of innovative work behaviors. Instead, we believe that problem identification could be studied more often as a specific outcome or as a predictor of the following phases of the innovation process. Problems can emerge from the interaction of different organizational, situational and individual characteristics; and willingness to be creative does not necessarily involve leaders being able to question spontaneously current practices. Furthermore, results from the fourth study in the present document highlighted that leaders who were willing to innovate did not engage in creative behaviors because they reported a lack of identified opportunities. In the present study, results demonstrate that when leaders emphasize values as guiding their managerial practices that differ from the values of organization, it constitutes a problem. When such a problem is identified, it increases leaders' dissatisfaction toward the practices that are prescribed by the organization. Consequently, this dissatisfaction constitutes the trigger to perceive need for change and innovative behaviors. Moreover, results show that misfit effects on dissatisfaction predicted negatively leaders' compliance with prescribed practices. Thus, apart from organizational support for innovation or individual abilities, predispositions and even intentions, research should give more importance to situational characteristics that are not related directly to creativity when studying the antecedents of management creativity and innovation.

Moreover, validity of the present results could be improved if hypotheses were tested by an experimental design. For example Chatman and Barsade (1995) tested experimentally the effect of personality and culture fit on cooperation. They assessed business students' disposition to cooperate and they assigned randomly them to experimental conditions that stimulated an organization that either fit or misfit students' personality. These authors demonstrated that cooperative students in collectivistic organizations were perceived as more cooperative, reported working with the greatest number of collaborators and preferred collective rather than individual work evaluation. In misfit situations, students with a cooperative tendency were more responsive to the differences of organizational culture. By following the example of Chatman and Barsade's study (1995), further research could assess individuals' values and stimulate experimentally different misfit situations for different values



to explore and compare how it influences dissatisfaction and innovative behaviors. Moreover, this kind of experiment could enable demonstrating that misfit situations increase to a larger extent innovative behaviors in comparison to fit situations.

Second, the present results repeat the call to explore dissatisfaction as a potential source of positive behaviors. Dissatisfaction is generally considered as a detrimental factor for organizations and their members, in particular because of its non-negligible involvement in turnover and absenteeism (e.g., Hom, Caranikas-Walker, Prussia, & Griffeth, 1992). However, the present result supports the assumption that leaders' dissatisfaction can, under specific conditions, trigger a positive process that is accomplished by the adoption of innovative behaviors (Zhou & George, 2001). This assumption questions the attraction-selection-attrition theory (Schneider, 1983, 1987) that posits that individuals who do not fit in the organization necessarily end by quitting. In contrast, we believe that some individuals have the potential to become mavericks when they evolve in an organization that does not share their own values and embrace consequently the challenges of improving current practices (Jones et al., 2011). In a preliminary research, Birkinshaw and Mol (2006) reported that, while studying the emergence of management innovation in several organizations, they noticed that innovation addressed always an internal problem: the dissatisfaction with the status quo. More precisely, they identified three types and levels of dissatisfaction with the status quo that had the potential to trigger management innovation: a future threat, a current problem or a means to escape a crisis. The authors labeled the first phase of the innovation process *Dissatisfaction with the status quo*. Later, it was included in a broader phase of the management innovation process named Motivation (Birkinshaw et al., 2008), which may have had for consequence to impede the expansion of research on dissatisfaction and management innovation. In the present study, dissatisfaction was studied at an individual level and as a consequence of a current problem: the incongruence between the leader and his/her organization's values. However, future research could aim at identifying the different sources of dissatisfaction that instill a favorable situation for management innovation. Also, the present results show that dissatisfaction does not necessarily result in innovative behaviors. In fact, dissatisfaction predicted positively innovative behaviors only through the path of readiness for change. Thus, leaders need to find in their own dissatisfaction the source of motivation to generate positive change; otherwise the innovation process is less likely to start. Sense of responsibility for change did not appear as a substantial stage of the identified innovation process. Nevertheless, it remains possible that the process from PO value misfit to leaders' innovative behaviors is more complex than the one highlighted in the present study.

A third implication concerns the potential of investigating identified motivation as a way to promote management creativity and innovation. The question of how different types of motivation influence creativity has been raised many times in research on creativity. As highlighted in study 4, promotion focus that captures advancement, growth, and accomplishment as sources of motivation is positively related to creativity (see also, Friedman & Förster, 2001; Herman & Reiter-Palmon, 2011). Amabile (e.g., 1983; 1985; 1996) considered that individuals who were intrinsically motivated by a specific task were more likely to be creative when completing the task. At the same time, she assumed that extrinsic motivation did not influence or negatively influenced creativity because it works in opposition with intrinsic motivation. Nevertheless, in her last update of the componential model of creativity, she updated her position on extrinsic motivation (Amabile & Pratt, 2016). Drawing on the work of Deci and Ryan (1985), Amabile and Pratt (2016) identified that Informational motivation, that is a specific type of extrinsic motivation, facilitated creativity. Indeed, informational motivation enables people to build their competence and confirms the value of their work. Consequently, individuals have a greater self-efficacy toward their work, which enhances their ability and willingness to suggest improvements (Amabile & Pratt, 2016). Identified motivation, which differs from informational motivation, has almost never been explored as a potential antecedent of creative and innovative behaviors (Kasof et al., 2007). Yet, it constitutes a relevant objective for research that studies creativity in organizational settings. Future research could compare the effects on the different types of motivation on creative behaviors.

Moreover, scholars focused mainly on skills or personality traits of leaders capable of idea generation or idea championing but we know very little about the characteristics of leaders capable of questioning and refusing current practices because they believe in specific values and refuse to act in contradiction to them. We know already that individuals who generate new ideas are not always the ones in the best position to evaluate or implement them, because these different stages of the innovative process entail different skills and traits (Basadur, 2004; Scratchley & Hakstian, 2001). Correspondingly, we could conceive that leaders who have high Identified motivation, in the sense that they integrate values that are important for them as the principal drivers of their behaviors, are in the best position to identify problems that are worth solving creatively. Nevertheless, organizations may need individuals with complementary skills to complete the innovation process. Thus, studying the characteristics of leaders with such capacity could critically enhance our understanding of individual characteristics facilitating creativity.

Furthermore, the present study did not inspect how individual and organizational characteristics intervene in the process from PO value misfit to dissatisfaction and innovative behaviors. For example, we should have postulated an effect of intrinsic motivation on creativity or creative self-efficacy as enhancing factors of the misfit effect on innovative behaviors. Moreover, because we focused here on a negative affect (dissatisfaction), we could rely on the previous work of Baas, De Dreu and Nijstad (2011, 2008) to examine how regulatory focus may intervene as a moderator of a dissatisfaction effect on innovative behaviors. Similarly, we can suppose that leaders who experience a misfit on values such as self-enhancement or self-transcendence can still perceive that their organization supports their creative efforts. Thus, organizational climate could be assumed as a moderating factor influencing the effect of value misfit on innovative behaviors. This last assumption may not apply to every value. Indeed, leaders who evaluate that their organization emphasizes Conservation or depreciates Openness to change would certainly report a very low perceived support for creativity. In this case only, organizational values could appear as a confounding assessment of organizational climate for creativity. Nevertheless, individual and organizational characteristics that influence the process of management innovation from PO value misfit or dissatisfaction should receive further attention.

As in studies linking misfit to job crafting, when innovative behaviors emerge from a PO value misfit, they should have for consequence to minimize the level of misfit. Indeed, innovative behaviors are in such cases directed to find managerial practices that are closer to leaders' values than practices that are prescribed by the organization. As a consequence, leaders who succeed in the implementation of such practices, in the large sense of being recognized by their organization, should experience a minimization of the perceived misfit. In order to demonstrate that innovative behaviors resulting from misfit are aimed and succeed to minimize these incongruence, further studies would need to apply a longitudinal design to studies of misfit and creativity.

Finally, we did not investigate how specific value fit had a direct effect on creativity or compliance with prescribed practices. Kasof et al., (2007) studied the direct effect on individual values, as theorized by Schwartz (1992), on creativity. By considering self-determination as the value most positively associated with creativity, the authors showed that the relationship between creativity and values decreases monotonically as one moves around the circular structure of the model, from self-determination and in both directions. In this way, Kasof et al. (2007) were able to note a relatively direct effect of the desire to achieve certain values on the emergence of creative and innovative behaviors. Similar results are found in the

present study. Indeed, correlations between individual values and innovative behaviors were greatest for the values Self-direction and Stimulation which adequate Kasof et al.'s (2007) results. Moreover, these values had correlations close to zero with Compliance. Even though it was not of specific interest in the present study, it could still be beneficial to further Kasof et al.'s (2007) findings by studying the direct effect of value fit on innovative behaviors. In addition, as we assessed also leaders' compliance with prescribed practices, we could postulate different, even opposite, hypotheses regarding the effect of PO value fit on leaders' innovative behaviors and compliance.

In conclusion, this research adds to previous work on dissatisfaction as a source of creativity and innovation (e.g., Zhou & George, 2001) by identifying potential causes of leaders' dissatisfaction and by extending the understanding of the process through which dissatisfaction leads to innovative behaviors. Consequently, the present study highlights the need for research to focus on leaders' capacity to identify problems that, if not solved creatively, could almost necessarily lead to underperformance, disengagement or turnover.

## **Chapter 6: General conclusion**

In this chapter, we investigated the joint influence of managers and organization factors on managers' adoption of innovative behaviors. A first study adopted a supplementary perspective and examined the fit effect between perceived needs and supplies for specific aspects of the organizational climate. Results showed that fit or misfit effects on innovative behaviors differ according to the dimension of the climate investigated. Indeed, innovative behaviors increased mostly as supplies for organizational climate increased and was the highest when supplies were high and exceeded needs. Thus, we can conclude that the greater organizations' provide a climate that encourages and provides for creativity and innovation, the greater managers will engage in innovative behaviors. Regarding the dimension of organizational support, innovative behaviors increased as supplies and needs increased in congruence, until a certain point where supplies and needs in congruence were too high and innovative behaviors started to decrease. Thus, the more managers perceive that their organization supports their creativity is not synonym with the better. Thus, the extent to which organizations should provide support for creativity should be adapted to managers' needs, and at a moderated level. Regarding the dimension Challenge, innovative behaviors increased when supplies exceeded needs, when needs exceeded supplies and at a moderated level of supplies and needs in congruence. We previously discussed these findings and

proposed that these three situations may trigger innovative behaviors that are directed toward different purposes. Moreover, effects of SN fit for the dimensions support and challenge were found to increase managers' affective commitment toward their organizations that in turn influenced their adoption of innovative behaviors.

The second study adopted a complementary perspective and examined how the incongruence between managers and organizations' values that guide managerial practices could constitute a source of dissatisfaction toward which managers would respond by adopting innovative behaviors. Results demonstrate that specific values have more or less impact on dissatisfaction when their importance differs between managers and organizations. Overall, when seven values: Achievement, Stimulation, Self-direction, Universalism, Benevolence, Conformity and the subgroup Authority were differently important for managers and organizations, managers felt dissatisfied toward the prescribed practices. This dissatisfaction negatively predicted managers' compliance with prescribed practices and positively predicted innovative behaviors through a perceived need to change and a readiness to act for changing their practices.

These two studies have in common that they rely on a Person-Organization fit approach and that they stress the importance to study the extent to which managers correspond or differ from the organization on different aspects. These studies reiterate the interest of adopting a fit approach to study the antecedents of organizational creativity and innovation (Afsar et al., 2015; Choi, 2004; Livingstone et al., 1997; Puccio et al., 2000; Sarac et al., 2014; Spanjol et al., 2014).

However, the two studies differ in their approaches (supplementary and complementary), their objectives and the statistical analyses. Regarding the objectives, the first study implicitly postulated that innovative behaviors would mostly emerge from a satisfying situation, where managers received the necessary supplies to act creatively. However, results show that situations of misfit can also trigger innovative behaviors (notably for the dimensions organizational climate and challenge). The objective of the second study was principally to highlight that a misfit between individual and organizational values constitute a problem toward which managers can respond creatively. In the two studies, we focused on different source of motivation to be creative. The first study relied on a form of intrinsic motivation to create emerging from a positive situation, while the second study relied on an identified motivation, where managers act creatively in order to find practices that adequate their personal values. Moreover, we tested mediation analyses in the two studies but with different approaches to mediation because we wished to bring different empirical contributions. In the

first study, we are closer to Baron and Kenny's (1986) conception of mediation. Indeed, we first tested and interpreted the direct effect of SN fit on innovative behaviors, and then we tested the potential indirect effect through job satisfaction and affective commitment. Our main interest was to understand how the degree of adequacy between supplies and needs for the specific dimensions of organizational climate could influence innovative behaviors. Indeed, previous research investigated the effect of SN fit on organizational climate but none examined how such effect could differ on specific aspects (Choi, 2004; Livingstone et al., 1997). The test of a theoretical model was, in this case, of secondary importance. In contrast, the second study accorded a primary importance in indirect effects. Thus, we approached mediation as the indirect effects of values fit on innovative behaviors, calculated from the product of coefficients (Alwin & Hauser, 1975; Bollen, 1987; Fox, 1980; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Sobel, 1982; Sobel, 1987). In this second study, we did not investigate the direct effect of values fit on innovative behaviors because it did not constitute an effect of primary importance regarding the aim of the study. Indeed, the effects of values fit on creativity have previously been subject to numerous researches (e.g., Sarac et al., 2014; Spanjol et al., 2014) but none examined the path from misfit to innovative behaviors. Thus, even though we used the term mediation in the two studies, the tests of effects were based on the hypotheses and thus are notably different.

Finally, results of these two studies should not stress the importance of placing managers' in incongruent situations in order to boost their creativity. In contrast, we believe that managers that are in such situation can find the motivation to respond creatively, as long as misfit remains unfrequent and as long as innovative initiatives will receive a positive feedback. To our point of view, results have for theoretical implications to highlight the importance of considering managers' needs and giving the possibility for managers to express their values instead of imposing them to comply with values that are not theirs. Organizations need to build a climate for creativity to communicate values, but they also should emphasize that they are flexible and that they emphasize diversity in managers' profiles, values and practices. By doing so, organizations give managers the necessary liberty to suggest and adopt practices that are more adapted to them and their team.

# Chapter 7: Overall discussion

The aim of the present research consisted in investigating the antecedents of managers' decisions to engage in creative actions. Drawing from the work of Ford (1996), we assumed that managerial creativity involves infrequent actions that were competing with routine behaviors. Thus, we assumed that managers would not be willing to express creativity as long as it remained a less attractive option than applying existing practices. To understand individual differences of leaders' decisions to act creatively, we identified three avenues of research.

## Implicit theories of managerial creativity

The first research avenue was grounded in previous results highlighting that creativity was not perceived as a characteristic of an effective leader (e.g., Epitropaki & Martin, 2004). Indeed managers' implicit conceptions of leadership never entailed the terms creativity or innovation. Such absence could simply mean that creativity is not a prototypical characteristic of leadership. However, a study conducted by Mueller, Goncalo, and Kamdar (2011) revealed that individuals who expressed creative ideas were perceived as not having leadership potential. This result raised the possibility that the absence of the creativity notion in implicit leadership theories could be the sign of a negative conception of managerial creativity.

To investigate this possibility, we explored first managers' implicit theories of managerial creativity and innovation. Why study both concurrently? The reason is that creativity is increasingly linked to innovation in organizations, and innovation entails a positive bias that could lead employees to conceive everything that is linked to innovation as a positive characteristic (Anderson et al., 2014). Thus, if implicit theories of creativity and innovation were related to a great extent, a positive conception of creativity could find its source in its close relationship to innovation. Results demonstrated that creativity and innovation entail mostly positive characteristics for management (e.g., *imagination, novelty, ideas*), that these two are closely related in implicit conceptions, and that these theories corroborated scientific findings. These results seem to refute the possibility that managers hold a negative conception of creativity when it applied to their activities and they raise the question of the potential

presence of a pro-innovation bias (Anderson, Potocnik, & Zhou, 2014; Kimberly, 1981). A second investigation (Study 1, part 2) of these characteristics allowed us to identify the structure of the implicit theories of creativity and innovation. Results showed that creativity was a core concept for innovation, whereas innovation was conceived as a potential outcome of creativity. Once again, these conceptions are coherent with explicit theories regarding the process leading from creativity to innovation. Managers reported even conceptions that are compatible with Paulus' (2002) approach of the innovative process as a recursive loop in which creativity intervenes in every phase of the process and is stimulated by previous innovations.

Thus, managers' conceptions of creativity in their activities did not seem to be a potential source of impediment to managers' adoption of creative actions. However, if implicit conceptions of creativity related to managerial activities entail several characteristics that echo traits of personality (e.g., *openness*, *curiosity*), we were not able to conclude with certainty that these traits characterized a creative manager. Indeed, management and creativity are often understood together in a way suggesting that managers have the responsibility to supervise the creativity of their collaborators (e.g., Basadur, 2004; Mainemelis, Kark, & Epitropaki, 2015, see the section Creative leadership in the introduction of the present document). Thus, traits that were collected in the first study could have applied to managers that need to support others' creativity or to employees that are expected to be creative. Thus, we investigated also managers' implicit conceptions of the characteristics of a creative manager (Study 2). Results demonstrated, once again, that managers' implicit theories entailed predominantly positive characteristics and corroborated explicit theories.

Nevertheless, we would like to discuss the third dimension of implicit theories of a creative manager (Study 2) that retained our attention. This dimension is composed of adjectives such as *reliable*, *responsible* and *honest*. These characteristics are not usually highlighted as prototypical of a creative person. In fact, *honest* has been identified as a prototypical adjective of non-creative person (Gough, 1979). Moreover, the present results did not retrieve adjectives characterizing a creative person such as *egotistical*, *individualistic* or *snobbish* (*ibid.*). From this result, we could infer that managers who are perceived as creative may not personify every aspect of a creative person in general, but they need still to exert characteristics of a reliable and rational person. Is this a sign that creative individuals who became managers have the ability to conceal their unadapted traits? In this sense, Pech (2001) highlighted that managers may have the tendency to exert traits or behaviors that conform to organizations and senior managers' expectations even if they oppose their attitudes or values



in order to satisfy their needs for inclusion, recognition or power. In contrast, we could also infer that managers who are perceived as creative managers may not be the ones who are truly creative individuals but rather the ones who reflect an image of what their organization expects when conceiving managerial creativity. In this case, does the organization support managers who truly have the characteristics of a creative person and presumably the potential to suggest managerial innovations when they propose creative practices? These questions remain unanswered, at this point, but could be investigated by studying the relationship between external appraisal of managers' characteristics and their creative potential and/or performance.

Moreover, one of the main interests of studying leaders' implicit theories of creativity is that they are supposed to influence managers' evaluation of creative people and practices and their adoption of creative behaviors. Consequently, Study 3 examined the relationship between managers' implicit theories of creativity and their actions related to creativity (evaluation and behaviors). Results demonstrated that implicit theories are subject to individual differences that impact creative actions. Indeed, we identified that the participants could be divided into three groups within which they shared similar implicit conceptions and between which they shared different conceptions.

A first group emphasized terms that relate to the products of managerial creativity (e.g., *innovation, novelty, change*) and deemphasized terms that assert interaction with others (e.g., *trust, communication, interaction*). This group evaluated significantly more positively adjectives that describe an imaginative person as characteristic of a creative manager, and adopted significantly less behaviors that relate to the management of creativity than the two other groups of managers. This group seems to conceive primarily managerial creativity as the expression of their own creative ideas that are aimed to improve practices. Their conceptions do not accentuate the collective aspect of creativity or the reliable characteristic of a manager.

The second group of participants emphasized aspects that are inherent of a creative manager (e.g., *openness, curiosity, listening*) and deemphasized aspects that concern the process or the management of innovation (e.g., *anticipation, brainstorming, strategy*). This second group had a significantly more critical evaluation of the creativity of managerial practices.

Finally, the third group stressed conceptions of creativity that are related to the process and the management of innovation (e.g., *organization, anticipation, proactivity*) and deemphasized aspects that relate to the inherent characteristics of a creative person (e.g., *curiosity, imagination, moving outside the framework*). For this third group, managerial

creativity seems to be mostly synonym with the management of creative people and ideas rather than the expression of their own creativity. However, the third group reported an increased adoption of behaviors related to managerial creativity. We are not, at this point and given the present results, able to give any tangible interpretation of these surprising results. Moreover, the third group differed also significantly as they evaluated more positively the creativity of managerial practices and as they emphasized the adapted feature in their evaluation of these practices.

These results highlight that managers' engagement in specific creative behaviors is influenced by the way managers conceive creativity as applied to their activities. As stated in this thesis, managers' conception of creativity is primarily perceived as an ingredient of the sensemaking process. This implies that the way managers perceive and take into account their predispositions, the characteristics of the situation, and the environment may actually differ as a function of their implicit theories. However, this assumption has not been investigated in the present work and needs further empirical inquiry.

Moreover, implicit theories are assumed by some scholars to be potentially influenced by organizations as they result from individuals' knowledge, experiences and environment (e.g., Junker & Van Dick, 2014; Lord et al., 2001; Romo & Alfonso, 2003). Thus, organizations may have the ability to bring managers the knowledge about scientific findings regarding managerial creativity and the diversity of characteristics and domains of application that it entails. Furthermore, we could postulate that the climate in organization or current specific situations may shape managers' implicit theories of creativity.

In fact, Mueller, Melwani, and Goncalo (2012) conducted two experimental studies that tested how experimenting situations of uncertainty could influence implicit attitudes towards creativity. Participants were confronted with situations that more or less generated a feeling of uncertainty. Then, they completed an Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) that assessed individuals' implicit preferences for either creativity or practicality. Results demonstrated that when individuals experience uncertainty, they are less likely to favor creativity rather than practicality, regardless of their level of openness. These results have important practical implications because problems that trigger creativity are most likely to entail uncertainty. Thus, we could have a priori expected the opposing results: individuals should be more favorable to creativity in uncertain situations and more likely to emphasize practicality in stable and comfortable situations. If such results apply also to managerial creativity, different sources of uncertainty need to be identified and their subsequent effects on innovative behaviors need to be tested. Indeed, we hope that uncertainty

resulting from problems that should be worth solving creatively do not hinder managers' preference for creativity over practicality. In contrast, uncertainty resulting from managers' concern about the organization and colleagues' reactions to their creative initiatives could hinder their implicit favorable attitudes toward creativity. This negative bias is theoretically part of the sensemaking process and has consequently the potential to be attenuated through the influence of individual and situational characteristics. For example, by improving managers' consciousness of their creative capacities or the norms regarding creative actions, organizations could heighten managers' perception that negative consequences are less likely to surface. Thus, further research should replicate Mueller et al.'s (2012) findings in the management setting and identify how different sources of uncertainty can exacerbate a potential negative bias toward creativity.

A second important implication of Mueller et al.'s (2012) study is that it highlighted the influence of situations on managers' implicit attitudes toward creativity. As we showed in Study 3, implicit conceptions are related to managers' behaviors. Thus, identifying how organizations could shape implicit attitudes toward creativity may importantly contribute to give organizations prescriptions to enhance indirectly managerial creativity. We are currently preparing a study that seeks to demonstrate that organizational climate can influence students in management' preference for creativity versus dependability. The main hypothesis of this study in progress relied on the associative – propositional evaluation model established by Gawronski and Bodenhausen (2006, 2011). Following this model, implicit evaluations of creativity are assumed to result from the activation of specific associations with creativity that are stored in memory. Stimuli that are present in the environment have the potential to activate different implicit conceptions of creativity. For example, if a manager characterizes creativity as useful but also as risk-taking, the environment may have the potential to more or less activate one of these two associations, which could consequently trigger or hinder manager's adoption of innovative behaviors. Thus, the first hypothesis we wish to test is that an organizational climate emphasizing creativity activates positive associations with creativity and consequently increases managers' favorableness toward creativity compared to dependability. We expect also the opposite effects for an organizational climate that emphasizes rationality and conformism. Consequently, we wish to investigate how implicit attitudes may have a partially mediated effect on respondents' intentions to apply for the job and adopt innovative behaviors, through explicit attitudes toward creativity. We expect that the results of this study will complement those of our third study by understanding the potential effect of the environment on implicit conceptions of managerial creativity.

To conclude on this first avenue of research, even though previous studies did not retrieve creativity as a prototypical attribute of an effective leader, managers perceive that creativity is a positive feature when applied to their activities. Moreover, their conceptions mostly corroborate explicit theories of creativity. However, aspects reflecting the potential difficulties that are inherent to creativity and innovation are predominantly absent in managers' implicit theories. Thus, these results are consistent with a pro-innovation bias that may hinder managers' perception of the disruptive and demanding aspects of engaging in creative actions. This bias could have for consequence that every time a difficulty arises when managers express creativity, they may perceive that this is not a normal part of the process and interpret it a sign to renounce. Conversely, being conscious of the difficulties can lead managers to perceive them as necessary steps that should not stop the process of innovation. Such effects on behaviors could not be tested because difficult aspects were absent in implicit conceptions. However, this hypothesis corroborates our results that different implicit conceptions were related to the adoption of different creative behaviors.

Finally, it is plausible that managers' specific implicit conceptions of creativity can be activated by the organizational climate. Thus, managers' implicit theories could be conceived as a lever that organizations can make use of to develop managerial creativity and innovation. Further research is still needed to understand how the climate, or even specific situations have the potential to activate managers' positive beliefs about creative responses.

## **The sensemaking process of managers' creative actions**

The second avenue investigated how facilitating factors of creativity are taken into account through a sensemaking process resulting in managers' intention to adopt innovative behaviors. Study 4 examined the distal effects of cognitive, conative and organizational factors on managers' intention to solve problems creatively at work, through a sensemaking process. Study 5 investigated the distal effects of managers' intentions to adopt innovative behaviors in order to implement telework, through a sensemaking process. The sensemaking process involves that managers interpret the different components of a situation and anticipate the potential consequences of the adoption of creative behaviors (Drazin et al., 1999; Weick, 1995). Thus, before forming intentions to adopt creative behaviors, we suppose that managers identify and interpret the facilitating and impeding factors from which they will process the

interest of acting creatively. Following the study conducted by Seligman (2006), we operationalized the sensemaking process by applying the Theory of Planned Behavior (Fishbein & Ajzen, 2011). Thus, distal variables were assumed to predict managers' attitude toward specific creative actions, their perceived behavioral control and the injunctive norms (only in Study 4). Results of the two studies stressed the relevance of taking into account the sensemaking process leading to creative actions.

Indeed, in Study 4, results indicate that managers' promotion focus, fluency and the perceived organizational support predicted positively their intentions to solve managerial problems by applying a divergent-convergent thinking process. However, these effects were completely mediated by variables composing the sensemaking process. More precisely, promotion focus enhanced managers' attitudes toward solving problems through a divergent-convergent thinking process; fluency increased managers' attitudes and their perceived capacity to solve problems efficiently when applying a divergent-convergent thinking process; and organizational support predicted descriptive norms (the extent to which managers' close environment was currently applying such a process to solve problems). In turn, attitudes, perceived capacity and descriptive norms predicted positively managers' intentions to solve problem creatively in the next months.

In study 5, we confronted managers with a hypothetical situation of telework implementation in their current teams and we examined the determinants of their intentions to adopt innovative behaviors to respond to the situation. Indeed, previous research and surveys ascertained that the slow development of telework in France was explained, *inter alia*, by the fact that managers were reluctant toward telework (Greenworking, 2012; Lister & Harnish, 2009; Peters & Heusinkveld, 2010). This reluctance was hypothesized to result partially from a concern about their capacities to adapt their managerial practices in order to respond to this new working method. Consequently, we examined the antecedents of managers' intentions to adopt innovative behaviors to implement efficiently telework. The distal antecedents we identified were: managers' attitudes toward telework, managers' attitudes toward new ideas, and the perceived organizational support for creativity. Results showed that organizational support predicted managers' attitudes toward new ideas and their perceived behavioral control; attitudes toward new ideas predicted managers' favorable attitudes toward the adoption of innovative behaviors to implement telework; and attitudes toward telework predicted both variables reflecting the sensemaking process (attitudes toward the adoption of innovative behaviors to implement telework and perceived behavioral control). In turn, the sensemaking process influenced managers' intentions to adopt innovative behaviors to

implement telework. However, it is worth noting that attitudes toward new ideas showed a positive direct effect on intentions to adopt innovative behaviors. Consequently, it seems that managers with favorable attitudes toward ideation are willing to act creatively without a preliminary examination of the potential consequences of creative actions.

The present studies extend previous research on managerial creativity in two ways. First, the present studies confirm results from previous studies that highlighted the effects of organizational support for creativity (West & Anderson, 1996), and of cognitive factors (Scratchley & Hakstian, 2001) and attitudes (Basadur & Finkneiner, 1985; Basadur & Hausdorf, 1996; Basadur et al., 1999) on managers' engagement in creative actions. Moreover, the present results demonstrated that the effect of promotion focus, a motivational construct, on creativity applied also in the management setting (Baas et al., 2011; Herman & Reiter-Palmon, 2011). However, the main contribution of these two studies consisted of highlighting the relevance of the sensemaking process to understand the mechanisms resulting in managers' engagement in creative actions. Most existing research attempted to identify the antecedents of individual creativity in organization without taking into account this process. Yet, research cannot assume that creativity results only from the presence of facilitators and the absence of impeding factors. Indeed, as stressed by Ford (1996), Ford and Gioia (2000), and corroborated by the present results, managers will exert creative actions only if they first interpret the different elements that compose a situation, and evaluate that creativity is a valuable outcome.

Ford (1996) went a step further and stated that creative actions should not only be perceived as valuable but should surpass the relevance of routine practices. A limitation of both present studies is that we assumed intentions to adopt innovative behaviors as necessarily opposed managers' application of routine practices. However, controlling for this could have improved the present findings. Indeed, it is plausible that managers who report intentions to solve problems creatively conceive that it applies only to one or two problems that they are currently facing. In this case, managers may still adopt routine solutions when confronted to any other ill-defined problems. Thus, further research could expand the present findings by taking into account both potential outcomes of creative and routine behaviors, as did Madjar et al. (2011).

The second contribution of Studies 4 and 5 is that they stressed the importance for research to focus on specific rather than general creative actions. Indeed, Study 4 departed from the observation that managers are not familiar with the ideation phase of the creative problem-solving (Basadur, 2004; Basadur & Basadur, 2011) and consequently focused on managers'

intentions to apply divergent-thinking then convergent-thinking when solving managerial problems in order to find more creative solutions. First, we asked managers to experience the divergent-convergent thinking process to ensure that every respondent had the minimum level of familiarity to interpret its potential effectiveness. Study 5 focused on the adoption of innovative behaviors that are directed toward telework implementation. Focusing on a specific creative action allowed us to assess the related sensemaking process. Indeed, when applying the Theory of Planned Behaviour (TPB), Fishbein and Ajzen (2011) advised specifying the behavior under study in terms of *Target, Action, Context* and *Time*. From this specific behavior, we can consequently conceive the constructs of attitudes, perceived behavioral control and injunctive norms and identify the relevant distal variables. Thus, without addressing a specific creative action, it is less likely that scholars will be able to identify the effect of the sensemaking process.

Ettlie and O'Keefe (1982) had previously stressed the importance of being specific when studying antecedents of innovative behaviors. By doing so, the authors identified three types of behaviors. The first concerned behaviors adopted by the *innovator* (e.g., suggesting new ideas, risk taking). The second type focused on maintaining the status quo (e.g., respecting rules, encouraging formality). The last one related to withdrawal (e.g., inability to accept variety and challenge on the job). Thus, well before Ford (1996), Ettlie and O'Keefe (1982) stressed already the importance of comparing innovative and non-innovative behaviors. Later, several scholars highlighted the necessity to nuance the innovativeness of behaviors (Gilson & Madjar, 2011; Litchfield et al., 2015; Madjar et al., 2011). Indeed, it has been demonstrated that radical and incremental creativity entailed different determinants (Madjar et al., 2011). For example, the presence of creative commitment and organizational identification has been found to predict only incremental creativity; whereas willingness to take risks, career commitment and resources predicted radical creativity (*ibid.*). In our case, managers could have reported intentions to suggest incremental or radical ideas but we were not able to assess this distinction. Further research could replicate the results and assess more precisely managers' intention and adoption regarding specific kinds of innovative behaviors. Therefore, we could be able to differentiate how behaviors leading to incremental and radical ideas are motivated to a different extent by facilitating factors and the sensemaking process. For example, we could identify that descriptive norms are a more important predictor of radical than of incremental innovations.

One limitation of focusing on specific creative actions is that it restricts the generalizability of the present results. Thus, we need to study a large scope of specific behaviors with a similar

methodology before being able to attest the general importance of the sensemaking process in managers' engagement in creative actions. Studying several specific actions could also enable identifying the general and/or specific determinants of their related sensemaking process. Moreover, in Study 4, we focused on a specific creative action: the use of the divergent-convergent thinking process to solve managerial problems, whereas we focused on a specific situation in the fifth study: the implementation of telework as a trigger of managers' innovative behaviors. Further research should try to specify both aspects - the action and the situation - simultaneously when studying managers' engagement in creative actions.

To conclude on this second avenue of research, we identified that cognitive, conative and organizational characteristics had the expected positive effects on managers' intentions to adopt specific creative actions. However, the presence of facilitating characteristics does not necessarily imply that managers will act creatively. In contrast, managers' are likely to adopt creative actions only if they judge that they are capable of doing it effectively and that it is relevant and beneficial in a specific situation and environment. Previous research paid a lot of attention to identifying the antecedents of organizational and managerial creativity (e.g., Binnewies & Gromer, 2012; Egan, 2005; Kunz & Linder, 2013; Scott & Bruce, 1994; Scratchley & Hakstian, 2001; Shalley et al., 2004). We wish now to reiterate the call to understand better how these antecedents are processed when specific situations that have the potential to trigger creativity arise (Ford, 1996; Ford & Gioia, 2000).

## **A Person-Organization fit approach to managerial creativity**

The third avenue applied a Person-Organization approach to study managers' adoption of innovative behaviors. Several scholars suggested studying the *confluence* between individual and organizational characteristics rather than only their direct effects (e.g., Mumford & Gustafson, 1988; Mumford & Hunter, 2005; Sternberg & Lubart, 1995; Woodman et al., 1993; Woodman & Schoenfeldt, 1989). This call has been previously noted (Choi, 2004; Choi & Price, 2005; Livingstone et al., 1997; Puccio et al., 2000), but no research focused specifically on managerial creativity as an outcome of a fit between the manager and his/her organization. Yet, we believe that managerial creativity is specifically the result of the encounter between an individual and an organization. Indeed, managerial innovation consists of a process during which a manager will question the existing practices of an organization,



suggest new ones and attempt to create adherence and implement these practices. Thus, the way a manager perceives adequacy with his/her organization may have the potential to facilitate or hinder the different steps of the creative process. In order to corroborate this assumption, we conducted two studies that took two different perspectives of the P-O fit approach. Study 6 adopted a complementary perspective that examined the adequacy between managers' needs to be creative and organizational related supplies. Study 7 adopted a supplementary perspective that assessed the extent to which managers and organizations give significance to similar values as guiding principles of managerial practices. Based on these two approaches we tested direct or indirect predicting effects of P-O fit on managers' adoption of innovative behaviors.

Results of Study 6 demonstrate that supplies-needs fit influenced differently managers' innovative behaviors depending on the resources they have at their disposal. Indeed, regarding the general dimension of organizational climate for creativity, innovative behaviors are mainly influenced by organizational supplies. Thus, whether or not managers express need for a general climate that supports creativity, a greater perception of supplies increases managers' adoption of innovative behaviors. However, when managers expressed a high need for organizational climate and perceived very poor fulfillment of such need, innovative behaviors still increased but to a lesser extent than in a situation of fit. Thus, managers who express greater needs seem to be more willing to adopt innovative behaviors, whether or not their organization provides them the necessary resources, compared to managers who express less needs towards an organizational climate for creativity.

Regarding the specific dimension Organizational support, extremely high needs and/or supplies did not predict the greatest adoption of innovative behaviors. In contrast, managers' innovative behaviors are adopted to a greater extent when organization provides a support in line with managers' needs at a moderate level. Thus, the expression of too many needs could signify that managers do not feel capable of being creative in an autonomous way, whereas too many supplies could be perceived as a pressure to create that hinders managers' creativity. In every way, organizations should pay attention to managers' specific needs for support because an exceeding amount leads to a loss of the expected benefits.

The Challenge dimension entailed different effects. Managers adopt innovative behaviors to a similar extent in three different situations: When they report high needs for challenge and perceive that their organizations do not provide any challenging tasks, when they are confronted to challenges that largely exceed their needs to be creative, and when they report a moderate level of needs in line with the level of challenge they are experiencing. As stated

previously, we believe (but could not demonstrate) that these three situations trigger innovative behaviors for different reasons. Needs exceeding the current level of challenge could spark innovative behaviors that are aimed to diversify managers' tasks. Conversely, when needs are inferior to the current level of challenge, managers could adopt innovative behaviors that are aimed at finding solutions to problems with which they are not familiar. In situations where needs adequately supply for Challenge, we assume that managers have more ease to adopt innovative behaviors to respond to different problems or opportunities. Moreover, we examined potential explanatory variables for the effect of S-N fit on innovative behaviors. Results showed that SN fit predicted positively job satisfaction (except for the dimension Organizational support) and affective commitment. Affective commitment was then identified as a mediator of the effects of SN fit on innovative behaviors for two dimensions of the climate: Organizational support and Challenge. Thus, the degree of adequacy between managers' needs for creativity and organizational-related supplies does not only influence managers' engagement in creative actions but also impacts more general and essential aspects of their work. Finally, we hypothesized that the effects of SN-fit differ depending on the extent to which creativity was important for the managers or expected by the organization. Results showed that creative role identity and organizational expectations for creativity had a positive influence on managers' innovative behaviors but did not moderate the effects of fit as we expected. Overall, results attest the relevance of a SN fit approach to investigate antecedents of managerial creativity. They highlighted also that misfit could increase managers' adoption of innovative behaviors, as in the case of organizational support and challenge.

Therefore, study 7 investigated how innovative behaviors could result from a misfit between the manager and his/her organization. Among the determinants of managerial behaviors, personal values are of specific importance (e.g., Fleishman & Peters, 1962; Sarros & Santora, 2001; Westwood & Posner, 1997). Indeed, according to Schwartz (1992), personal values guide the selection of specific behaviors and are relatively stable across situations. However, organizations are also characterized by a set of values that guide the practices that are accepted and rewarded in the organization (Finegan, 2000; Peters & Waterman, 1984; Schwartz & Bilsky, 1990). Consequently, managers who emphasize values that differ from the ones affirmed by the organization should experience a form of dissatisfaction toward the prescribed practices that could lead them to question their activities and suggest new practices that transcribe their values. We tested successfully this assumption. Indeed, we assessed the extent to which values constituted guiding principles for managers and their organization,

managers' dissatisfaction toward prescribed practices, managers' perceived need for change and readiness for change, and their adoption of innovative behaviors. We found that seven groups of values: Universalism, Achievement, Stimulation, Self-direction, Benevolence, Conformism, and Authority influenced managers' dissatisfaction toward prescribed practices when the organization and the manager disagree on their relative importance. For every group, dissatisfaction increased as leaders attributed more importance to the value than organization. For the values Universalism and Authority, dissatisfaction increased also as organizations gave more importance to these values than individuals. We have trouble interpreting this effect for the value Universalism. Further research could seek to understand why are managers more creative when organizations emphasize values of equality, justice and respect more than they do.

In contrast, this effect for the value Authority corroborates previous research on liberating, charismatic or democratic leadership. Indeed, one of the main differences between leadership and management lies in the fact that leaders relied on an informal and shared authority to supervise their team, whereas managers tend to use the argument of authority to force individuals to comply to rules and practices of the organization (Dansereau, Graen, & Haga, 1975). Hamel (2009) stressed the necessity to eliminate the use of formal authority that goes along with a higher place in the organizational hierarchy. Indeed, the use of formal authority has been found to increase management's distrust of employees (Ghoshal, 2005) and employees' opportunistic behaviors (Ghoshal & Moran, 1996), to hinder collaborators' commitment toward the organization (Basu & Green, 1997) or to stifle innovation (Puccio & Cabra, 2010). Managers' authority and power should originate in employees' acceptance rather than organizational decisions and should be delegated when needed to empower collaborators on specific tasks and project (Hamel, 2009). Thus, managers who are aware of this necessity to gain informal authority may be more dissatisfied when organizations expect them to embody formal authority. Therefore, managers seek to discard prescribed practices that could be prejudicial, and express creativity in order to find practices that will correspond to their personal values. We believe that management creativity and innovation is more than ever a question of finding practices that enable managers to avoid the use of formal authority.

The two studies of Chapter 6 contributed to highlight the benefice of taking a PO fit approach to study managerial creativity. Moreover, they emphasized the potential of misfit situations as triggers of innovative behaviors. The question of the longevity of such effects is now raised. How long should misfit situations last before managers stop acting creatively and start to adopt passive or negative and active behaviors? Answers can be sought by relying on a self-

regulation approach to PO fit (Johnson, Taing, Chang, & Kawamoto, 2013). This approach proposes that when individuals perceive a discrepancy between desired and current work conditions they adopt behaviors that are aimed to reduce this gap. This conception would imply that managers could adopt innovative behaviors in order to reduce the misfit between their needs and the current supply for organizational resources to be creative, or to improve the congruence between managers and organizations' values. We cannot attest in Study 6 that innovative behaviors influenced by misfit situations were aimed to reduce the discrepancy between their needs and the current supply. We raised only the possibility that situations in which managers' needs for challenge exceed the current level of challenge in their tasks may lead them to adopt innovative behaviors to reduce such misfit.

Moreover, in Study 7, we assessed specifically managers' adoption of innovative behaviors resulting from identified motivation. Thus, innovative behaviors were directed toward the goal of finding practices that embodied managers' values. Consequently, the confirmation of the effect of misfit on managers' innovative behaviors that are aimed of reducing this misfit needs further research. More precisely, further research could rely on previous studies on problem recognition (e.g., Mumford, Reiter-Palmon, & Redmond, 1994; Reiter-Palmon, Mumford, O'Connor Boes, & Runco, 1997; Reiter-Palmon & Robinson, 2009) in order to understand better the extent to which misfit situations can constitute problems toward which managers will recognize the necessity for creative responses.

Furthermore, the self-regulation approach assumes that the effect of discrepancy on behaviors that are aimed to reduce it should be studied as an iterative process. To do so, scholars need to collect velocity information. It refers to the individual's judgments about the past, present, and/or future evolution of the discrepancy between his/her ideal and actual work situation (Johnson et al., 2013). Velocity focuses on the perceived direction (positive vs. negative) and the rhythm (fast vs. slow) of changes that are the consequence of their behaviors (*ibid.*). Thus, if managers adopt innovative behaviors to reduce the misfit, they may therefore evaluate the impact of their behaviors. Depending on their evaluations that innovative behaviors reduced or not misfit, managers can then engage in more creative efforts or disengagement (Johnson et al., 2013). Stepping away from the basic assumption of the self-regulatory approach of PO fit, we could use the concept of velocity to study the extent to which managers' evaluate the effectiveness of their innovative behaviors that resulted from a misfit situation and consequently replicate or stop engaging in creative actions.

Finally, Cable & Edwards (2004) suggested that supplementary and complementary perspectives of fit should compose an integrative model designed to understand how they

both simultaneously influence potential outcomes. Livingstone, Nelson, & Barr (1997) demonstrated that needs-supplies and demands-abilities fit for creativity had different patterns of effect on strain, job satisfaction, commitment and performance. However, they did not incorporate a complementary perspective of fit and they did not test the different effects on innovative behaviors or performance. Thus, further research is needed to develop a more complete model of fit to explain its effect on managerial creativity. Moreover, supplementary and complementary perspectives of fit can apply to several characteristics of managers' function. Also, fit may not necessarily concern the congruence between a manager and his/her organization but can also relate to the fit between managers and their teams or their jobs. A promising contribution to managerial creativity and PO fit research would consist of studying simultaneously managers' fit with several actors and characteristics of his/ her job. Conducting such research could help to understand the extent to which misfit situations are beneficial when they apply to specific characteristics. A first could consist in reviewing previous studies that highlighted fit or misfit effects on creativity and innovation.

Moreover, we could postulate that misfit between values have greater chances to trigger innovative behaviors when they are not coupled with several other situations of misfit. Instead, managers may need to feel mostly congruent with several aspects on their job in order to be able to respond to a specific misfit situation by adopting innovative behaviors. To conclude, Person-Organization fit constitutes a promising and under researched approach to understand better managers' engagement in creative actions.

## Limitations

The objective of our research was to examine the antecedents of managers' engagement of creative actions. This objective necessarily implied relying on self-report measures of innovative intentions or behaviors. We will not discuss here again the potential common method biases that are associated with cross-sectional designs, data collection from one source and at one occasion, and self-reports. We did our best to ensure that we identified and controlled if necessary the existence of such biases. Moreover, current debates emphasize the need to stop overstating that common method variance are necessarily present and constitute undoubtedly a limit to the validity of related findings (Brannick et al., 2010; Chan, 2009; Spector, 2006; Spector & Brannick, 2011).

The first limit is that the data presented in this research were collected from a population of French managers. Consequently, the interpretation of our findings and specifically regarding

managers' implicit theories of creativity and innovation should be restricted to the understanding of managers' engagement in creative action in French organizations.

Second, findings that are presented in this research apply strictly to managers' intentions or engagement in creative actions and cannot be generalized to managerial creative performance. Managers' engagement in creative behaviors is a necessary antecedent of management innovation. According to Pretz and McCollum (2014), self-perceptions of creativity on specific tasks are better predictors than personality of creative performance. Yet, engagement in innovative behaviors is far from being the only predictor of creative performance and management innovation. Further research is needed to demonstrate that engagement resulting from the different sources that we identified predicts leaders' creative performance or management innovation. But to date, we are not in position to extend the present findings to any sort of creative success.

Third, a psychometric issue that has been present in every study and not extensively discussed is the dimensionality of innovative behaviors. Researchers should fill the gap between theories on the innovation process and their related empirical demonstration. Scott and Bruce (1994) discussed the possibility that individuals may not be able to distinguish the phases of the innovation process and consequently report their engagement in every innovative behavior to a similar extent. Except these authors, no scholar raised the possibility that participants may not conceive the innovation process as composed of several distinct phases. Yet, every scale that we used to assess managers' innovative behaviors was found to be unidimensional. The only exception is the scale developed by George and Zhou (2002) which we used in Study 3. This scale did not focus on innovative behaviors but creative performance. The authors did not report a test of the dimensionality of their scale, only an acceptable reliability estimate when the thirteen items were conceived as assessing a unique construct. In our case, we found that the scale could reflect three distinct dimensions that emphasized different types of creativity-related behaviors. The first dimension was composed of behaviors that related to creativity in several domain of application (e.g., "Searches out new technologies, processes, techniques, and/or product ideas"). The second dimension focused on creativity related to managerial activities (e.g., "Suggests new ways of performing work tasks."). The third dimension related to the management of creativity (e.g., "Promotes and champions ideas to others"). Thus, if this scale was found to be composed of multiple dimensions, they do not necessarily reflect the different phases of the innovation process. If managers would have conceived the innovation process as a multiple step process, we could have assumed that predictors had different effects depending on the phase of the innovation process under study.

Thus, previous and present results question the possibility of assessing managers' engagement in specific phases of the process by using self-report measures.

## Overall practical implications

The present thesis highlighted several implications for organizations wishing to increase managers' engagement in creative actions. The first implication concerns the objective of the present research. Organizations tend to focus on innovative performance, without seeking to identify the levers of engagement in creativity. Yet management innovation has no chance to emerge if leaders do not previously form intentions to question the status quo and look for new practices. Previous and present findings demonstrate however that organizations have a decisive role in managers' engagement in creative actions. First, results reiterated the call for organizations to build a climate that encourages and supports creativity. However, we observed that descriptive rather than injunctive norms had a positive influence on managers' intentions to innovate. Consequently, organizations should focus on embodying the support for creativity because it seems to have more positive influence on management innovation than executives' speeches and expectations. To do so, we suggest that organizations need to identify and collect managers' creative and risky initiatives. Stories about managers' creative actions that were implemented in the organization and that succeeded or failed should be told in order to normalize managerial creativity. Moreover, recognizing initiatives that failed enable to increase managers' comprehension of the difficulties that go along with innovation. It may help to limit the diffusion of a pro-innovation bias and enhance managers' perception that an innovation may take several back and forth steps before working. To do so, organizations have to find a way to make managers' proud of their failures, their small creative suggestions, and their attempt to do things differently.

Second, organizations should train and support managers in their identification of problems. As reported in Study 4, managers may have difficulties to recognize problems that are worth solving creatively. In fact, problems are often associated with uncertainty that can hinder managers' favorable attitudes toward creativity (Mueller et al., 2012). As everyone, managers tried to avoid problems in their activities, and when one arises, they may attempt to solve it as rapidly and securely as possible (Basadur, 2004). But organizations may have the ability to change such habits by rewarding attempts to create instead of reinforcing compliance, by giving time and resources to experiment new possibilities and by enhancing managers' skills in creative problem solving (e.g., Basadur et al., 1982). Moreover, managers who have the

capacity to identify problems may not be the ones with the greatest abilities to find creative solutions. This possibility complicates organizations' recognition of managers who are capable to identify problems to solve creatively. Also, it suggests that managerial innovation has greater chances to emerge if several managers are engaged in a unique innovation process. Yet, managers work together rarely as a team and are mainly focusing on working with their collaborators or superiors rather than their peers. Consequently, organizations may try to provide time and space for managers to meet and the possibilities to engage as a group in an innovation process.

Third, organizations need to listen to managers' needs to be creative. Organizations tend to conceive that the more they provide resources for creativity, the more it should facilitate creative actions and performance. However, providing too much support may have the reverse effect of pressuring managers and hindering their engagement in creative actions. The awareness of specific needs will consequently enable organizations to provide the adequate amount of targeted resources to maximize managers' willingness to be creative. More importantly, managers who express higher needs for resources to be creative appeared to be more inclined to engage in creative actions. We can believe that managers who are more self-aware of their needs attributed more importance to creativity in their activities. We could have assumed that managers who were truly creative could engage in creative actions out of nothing. Instead, we found that the more managers were demanding, the more they were willing to act creatively. Thus, organizations that seek to select creative managers and to provide them the necessary resources to exert creativity should assess individuals' self-awareness regarding their needs to be creative and should conceive that high demands are a good sign of individuals' future engagement in managerial creative actions.

Finally, the present research emphasized the need to constitute a cohort of managers with different values. Managers who share organizational values may be more willing to comply with prescribed practices. However, if organizations seek to develop management innovation, they should identify and promote individuals who are able to disagree with the norms because it does not fit their values. In this way, organizations have greater chances to collect suggestions about new and adapted behaviors and to enrich their catalogue of management practices. By doing so, it may thereafter be easier to assign leaders to teams who will benefit from their specific managerial practices. The present research focused on the adequacy between managers and organizations specific values. However, the discrepancy between individuals and their environment has also been studied as a stable construct: the need to be different. Joy (2004) created a scale assessing individuals' need to be different. His results



showed that the more respondents selected values that emphasized a need to be different, the more they were open to experience, seeking sensation and imaginative. Individuals' need to be different was also found to predict their originality scores in divergent-thinking tests. Joy (2004) concluded that individuals with a high need to be different were more likely to seek opportunities and engage in creative actions. Consequently, organizations may not necessarily identify managers with opposed values but could focus on selecting managers who have the tendency to question and oppose the norms.

# Overall conclusion

Managers' decisions to engage in creative actions rather than routine behaviors are certainly the least studied piece of the puzzle of management innovation. Indeed, most previous research examined the antecedents of managers' creative potential or performance. However, the present research demonstrated the managers' engagement in creative actions results from a sensemaking process that considers individual, organizational and situational factors. Thus, managers' engagement in creativity constitutes a distinct issue that can enable scientists to provide several practical implications for organizations wishing to develop management innovation.

In conclusion, the present research demonstrates that managers conceive positively creativity when applied to their activities. Moreover, they engage in creative actions when they perceive that it constitutes the most relevant response to a circumstance, and they have the ability to counteract misfit situations by adopting innovative behaviors. Scratchley and Hakstian (2001) made the following statement: "creativity has been considered as the antithesis of rationality and, thus, the antithesis of effective management" (p.367). In contrast, the present research highlights that managers' engagement in creative actions results mostly from their rational decision that it is the best way to lead effectively.

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# Université Paris Descartes

**ED 261: Cognition, Comportements, Conduites Humaines**

*Laboratoire Adaptations Travail – Individu*

## **Thinking outside the boss:**

*Understanding managers' engagement in  
creative actions*

By Justine Massu

## **APPENDICES**



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# Université Paris Descartes

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## **Sortir du cadre :**

*Comprendre l'engagement des managers  
dans des actions créatives*

Par Justine Massu

## **ANNEXES**



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# Université Paris Descartes

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## Thinking outside the boss:

*Understanding managers' engagement in  
creative actions*

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## APPENDICES



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# Appendix 1. Chapter 2:

## Theoretical framework

### Appendix 1.1. Different perspectives on the creativity and innovation process

To identify and understand the nature of creative behaviors, we need to comprehend the process by which a manager can express his/her creativity to propose innovations. Theories about the creative and innovative process aim to understand the nature of the behaviors and mental mechanisms involved when the individual engages in a creative activity. These behaviors are often studied as belonging to the stage of invention (during which creativity is expressed) or to the exploitation stage (which refers more to implementation and innovation) (e.g. Duncan, 1976; March, 1991, Mom, Van de Bosch & Volberda, 2007, Roberts, 1988, Staw, 1990). These two main phases have been distinctly studied and have been subdivided into precise actions. Concerning the stage of invention, Lubart (2001) establishes from a review of the literature a four-phase model of the creative process. The first phase is called *Preparation* and consists in defining and framing a problem that the individual is confronted with and which he/she proposes to solve by means of creativity. The second phase is *Incubation*, which consists in thinking about solutions in a quasi-unconscious way, generating many ideas to select only the most promising ones. This phase is followed by *Illumination* in which a promising idea occurs to consciousness and can be stated. Finally, the fourth phase is the *Verification* in which the individual evaluates, refines and develops his/her idea. Lubart (2001) acknowledged that this four-phase process might differ according to the domains and tasks where creativity is expressed.

Research on the creative process has also proposed models that are specific to the organizational context. Amabile (1996) suggested a more general model, also focused on the stage of invention and also organized in four phases that echo behaviors. First, the individual identifies a problem or task. Faced with this problem, he/she must then collect a set of relevant information and resources. Then, with the aim of solving the problem encountered, the individual must seek and produce solutions that are potentially new and adapted. Finally,

the fourth step requires that the individual communicate on the suggested solutions in order for one or more to be selected.

At the same time, Basadur (1979, 1982, 1992, Basadur, Runco, & Vega, 2000) proposes a dynamic, circular and three-phase process of creativity that focused on organizational problem solving through creativity. These three phases are *Problem finding*, *Problem Solving*, and *Solution Implementation*. This approach to the process still related principally to creativity but extends the scopes of behavior by evoking both the stage of invention and exploitation.

*Problem finding* involves the deliberate discovery and identification of new problems that could be solved. Among these problems, Basadur, Runco, Vega (2000) gives an example of identifying opportunities to improve the satisfaction and well being of members of the organization. Such problem or opportunity finding reflects situations to which manager are confronted daily and toward which they can either respond creatively or through routine behaviors. This phase also implies that the problem can be redefined and conceptualized differently in order to widen the possible solutions to be implemented. For example, improving the well being of members of the organization can be a problem that is resolved by increasing sources of well-being or opposing by identifying and eliminating sources of stress and suffering. These two possibilities stem from the way the problem is identified and give rise to many different and complementary solutions. *Problem solving* includes behaviors that lead to the development of new and adapted solutions. This phase, which is unique for Basadur (1979, 1982, 1992, Basadur, Runco, & Vega, 2000), seems to combine the four phases presented in the Lubart's model (2001) and the phases *production*, *selection* and *communication* from Amabile's model (1996). Finally, the *Solution implementation* phase clusters the behaviors that allow the successful implementation of the proposed solutions, and from which results the identification of new problems, thus making the process circular.

Still in the field of creativity, Mumford, Mobley, Reiter-Palmon, Uhlman, and Doares (1991) relies on a review of the literature to propose an eight-step model: 1) *Problem construction*, 2) *Information encoding*, 3) *Category search*, 4) *Category specification*, 5) *Category combination and reorganization*, 6) *Idea evaluation*, 7) *Implementation*, and 8) *Monitoring*. These steps evoke 1) the identification of problems, from which 2) the individual will attempt to recall the necessary information necessary to understand it. Once the information has been retrieved 3) the individual must then try to identify to which categories this information belongs and 4) select the categories most relevant to the problem. 5) The individual can then



combine information from the different relevant categories in order to find new and appropriate solutions. The possible solutions will then 6) have to be evaluated with regard to their potential utility so that 7) the most promising one is implemented. When the solution is implemented, the individual must remain attentive to the information that will allow him to evaluate the usefulness of the proposed solution or to make the decision to modify this solution.

Moreover, specific research on managerial innovation also attempted to identify the different phases or behaviors that structure the stages of invention and exploitation (Damanpour & Aravind, 2011; Roberts, 1988). The phases of the innovation process found consensus in the four-phase approach proposed by Birkinshaw, Hamel, and Mol (2008). The first phase, *Motivation* refers to the conditions and factors that will lead the individual to formulate the intention to create and experience new managerial practices. Among these conditions and factors, several researchers agree that the process can only be triggered if agents inside the organization perceive a problem or an opportunity for improvement, such as the implementation of organizational change, and decide to respond by suggesting new managerial practices (Vaccaro, Volberda, & Van Den Bosch, 2012, Volberda, Van Den Bosch, & Mihalache, 2014). Faced with a problem or an opportunity for improvement, managers have three possibilities. They may choose to ignore the problem, adopt existing solutions, or preferably to try to develop new managerial practices that will enable them to respond to the problem in an optimal way (Volberda et al., 2014). It is precisely around this preliminary and necessary stage that our research is articulated. Birkinshaw and Mol (2006) had previously titled the first phase of the innovative process *Dissatisfaction with the status quo*.

The second phase, *Invention*, relates the action of creating hypothetical new practices. The third phase of *Implementation* encompasses the behaviors of implementing, monitoring and readjusting ideas. Finally, the fourth phase is the one on which the main difference between the process of creativity and innovation rests, since it consists in the *Theorization and labeling* of the implemented idea as an innovative managerial practice. This fourth phase no longer concerns the creative individual but relies on internal or external agents to the organization that are capable of validating and legitimizing the recognition of the practice as a managerial innovation.

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# Appendix 2. Chapter 3:

## Antecedents of managerial creativity and innovation

### Appendix 2.1. Individual and organizational antecedents of creativity and innovation

Individual characteristics	References
Personality	
<i>Openness to experience or ideas</i>	Da Costa, Paez, Sanchez, Garaigordobil, & Gondim (2015); Feist (1998, 1999); George and Zhou (1999; 2001); McCrae (1987); West (1987); Patterson (1999); Simonton (1991); Myszkowski, Storme, Davila, & Lubart (2015); Scratchley & Hakstian (2001)
<i>openess to change</i>	Scratchley & Hakstian, 2001
<i>Risk-taking</i>	Scratchley & Hakstian, 2001
<i>Tolerance to ambiguity</i>	Scratchley & Hakstian, 2001
Agreableness	
(-) on creative accomplishments or divergent thinking	Myszkowski, Storme, Davila, & Lubart (2015); King, Walker, & Broyles (1996)
(+) on convergent thinking	Myszkowski, Storme, Davila, & Lubart (2015)
Extraversion	King, Walker, & Broyles, 1996; McCrae, 1987
Neuroticism	McCrae, 1987
Conscientiousness	
(-) Dependability	Reiter-Palmon, illies, & Kobe-Cross, 2009
(+) Achievement	Reiter-Palmon, illies, & Kobe-Cross, 2009
Cognitive attributes	
<i>Intelligence</i>	Barron & Harrington (1981); Patterson (1999); <i>marginal effect in Scratchley &amp; Hakstian (2001); Sternberg (2007,2008)</i>
Task-specific knowledge	Amabile (1988); Amabile & Pratt (2016); West (1987); Wallach (1985); Taggar (2002)

Individual characteristics	References
<i>Problem-solving style</i>	Kirton (1976, 1989); Kirton (1978); Tierney, Farmer, & Green (1999)
Divergent thinking	Amabile (1988); Basadur & Runco (2000), Scratchley & Hakstian (2001)
Convergent thinking	Amabile (1988); Basadur & Runco (2000)
<i>Ideational fluency</i>	Barron & Harrington (1981), Scratchley & Hakstian (2001)
Diagnostic thinking	Puccio, Murdock, Mance (2005)
Visionary thinking	Puccio, Murdock, Mance (2005)
Strategic thinking	Puccio, Murdock, Mance (2005)
Evaluative thinking	Puccio, Murdock, Mance (2005)
Contextual thinking	Puccio, Murdock, Mance (2005)
Tactical thinking	Puccio, Murdock, Mance (2005)
Associative thinking	Mednick (1962)
Social skills	Amabile (1988)
Expertise	Amabile (1997); Amabile & Pratt (2016); Ford (1996)
Knowledge	Amabile (1997); Amabile & Pratt (2016); Krause (2004); Woodman, Sawyer, & Griffin (1993)
Conative attributes	
Tolerance of ambiguity	Barron & Harrington (1981); Feist (1998); Patterson (1999); Zenasni, Besançon, & Lubart (2008)
<i>Tolerance for complexity</i>	Puccio, Murdock, & Mance (2005)
Self-confidence	Barron and Harrington (1981); Ford (1996)
Unconventionality	West & Wallace (1991); Frese, Teng, & Wijnen (1999)
Originality	West & Wallace (1991); Patterson (1999)
Rule governed (negative relation)	Simonton (1991); Frese, Teng, & Wijnen (1999)
Authoritarianism (negative relation)	Simonton (1991)
Independence	West (1987); Patterson (1999)
Proactivity	Seibert, Kraimer, & Crant (2001)
Personal initiative	Frese & Zapf (1994)
Persistence	Amabile (1988)
Curiosity	Amabile (1988)
Energy	Amabile (1988)
Intellectual honesty	Amabile (1988)
Creative self-efficacy	Ford (1996); Tierney and Farmer (2002, 2004, 2011)
Perserverance	Feist (1998)
Sensation seeking	Joy (2004)
Disposition toward risk-taking	Feist (1998); Sternberg & Lubart (1995)
<i>Need for accomplishment</i>	Chusmir & Koberg (1986); McClelland (1961)
<i>Need for achievement</i>	Chusmir & Koberg (1986)
<i>Avoiding premature closure</i>	Puccio, Murdock & Mance (2005)
<i>Tolerance for risks</i>	Puccio, Murdock, & Mance (2005)
Risk-taking	Feist (1998); Prabhu (2011); Sternberg & Lubart (1995); Tyagi, Hanoch, Hall, Runco, Denham (2017)

Individual characteristics	References
Values	
Conformity value (-)	Kasof, Chen, Himsel, & Greenberger (2007); Zhou, Shin, Brass, Choi, & Zhan (2009)
Openness to change values (+)	Kasof, Chen, Himsel, & Greenberger (2007)
Job satisfaction	Choi (2004); Livingstone & Nelson (1994); Spanjol, Tam & Tam (2013)
Dissatisfaction	Yuan & Woodman (2010); Zhou & George (2001)
Expected image gain (-)	Yuan & Woodman (2010)
Expected image risks (-)	Yuan & Woodman (2010)
Expected positive performance outcomes	Yuan & Woodman (2010)
Organizational commitment	Howell, Shea & Higgins (2005); Zhou & George (2001); Hou, Gao, Wang, Li, & Yu (2011)
Psychological contract fulfillment	Agarwal (2014)
Motivation	
Intrinsic motivation	Amabile (1983, 1985, 1988, 1997); Amabile & Pratt (2016); Woodman, Sawyer & Griffin (1993), West (1987); Frese , Teng, & Wijnen (1999); Yuan & Woodman (2010)
extrinsic motivation	
Informational motivation	Amabile and Pratt (2016)
Identified motivation	Kasof, Chen, Himsel, & Greenberger (2007)
Regulatory focus	
Promotion focus (+)	Baas, De Dreu, & Nijstad (2011); Herman & Reiter-Palmon (2011)
Prevention focus ( $\pm$ )	Baas, De Dreu, & Nijstad (2011); Herman & Reiter-Palmon (2011)
Creativity & achievement goals	Ford (1996)
Receptivity beliefs	Ford (1996)
Capability beliefs	Ford (1996)
Emotions	Ford (1996)
Attitudes	
Attitudes toward risk	Amabile (1988)
Attitudes toward change	Hage & Aiken (1973); Ettlie & O'Keefe (1982)
Attitudes toward innovating to change	Hage and Dewar (1973); Ellis & Webster (1998)
Innovation orientation	Kirton (1976), Ettlie & O'Keefe (1982)
Readiness to change	Ettlie & O'Keefe (1982)
<i>Valuing new ideas</i>	<i>Basadur &amp; Finkneiner (1985); Basadur &amp; Hausdorf (1996); Basadur, Taggar &amp; Pringle (1999)</i>
<i>Preference for ideation</i>	<i>Basadur &amp; Finkneiner (1985); Basadur &amp; Hausdorf (1996); Basadur, Taggar &amp; Pringle (1999)</i>
<i>Belief that creativity is not only for a select few</i>	<i>Basadur &amp; Finkneiner (1985); Basadur &amp; Hausdorf (1996); Basadur, Taggar &amp; Pringle (1999)</i>
<i>Not feeling too busy for new ideas</i>	<i>Basadur &amp; Finkneiner (1985); Basadur &amp; Hausdorf (1996)</i>

Individual characteristics	References
<i>Tendency for premature critical evaluation of ideas</i>	<i>Basadur &amp; Finkneiner (1985); Basadur &amp; Hausdorf (1996)</i>
Other	
Affect & Moods	Amabile, Barsade, Mueller, Staw (2005); Baas, De Dreu & Nijstad, 2009; Lubart & Getz (1997)
<i>sex</i>	<i>Chusmir &amp; Koberg (1986)</i>
External work contacts	de Jong & den Hartog (2010); Mol & Birkinshaw (2009)

Organizational characteristics (see Hunter, Bedell & Mumford, 2005 for a review on organizational climate)	References
Culture	Woodman, Sawyer, & Griffin (1993)
Managerial tenure	Kimberly & Evanisko (2010); Damanpour & Schneider (2006); (-) Scott & Bruce (1994)
Autonomy	Axtell, Holman, Unsworth, Wall, Waterson, & Harrington (2000); Dul & Ceylan, 2010; Ramamoorthy & Flood, 2005
Span of control	Axtell, Holman, Unsworth, Wall, Waterson, & Harrington (2000)
Job demands	Janssen (2000)
Support for innovation	Eisenberger et al. (1990); Axtell, Holman, Unsworth, Wall, Waterson, & Harrington (2000); Scott & Bruce (1994); West (1990); (-) Yuan & Woodman (2010)
Organizational and supervisory encouragement	Amabile (1997); Amabile & Pratt (2016)
Work group support	Amabile (1997); Amabile & Pratt (2016)
Recognition of creative ideas	Dul & Ceylan (2010)
Time for thinking	Amabile, 1988; Dul & Ceylan, 2010
Supervisor relationship quality	Yuan & Woodman (2010)
<i>Transformational leadership</i>	<i>Vaccaro, Jansen, Van Den Bosch, Volberda (2012)</i>
<i>Transactional leadership</i>	<i>Vaccaro, Volberda, &amp; Van Den Bosch (2012); Vaccaro, Jansen, Van Den Bosch, Volberda (2012)</i>
<i>Supportive leadership</i>	Choi (2005); <i>Vaccaro, Volberda, &amp; Van Den Bosch (2012)</i>
Participative leadership	de Jong & den Hartog (2010)
<i>Creative leadership</i>	Basadur (2004); Stoll & Temperley (2009); Xu & Rickards (2007)
Controlling supervision (-)	Oldham & Cummings (1998)
Supervisory expectations and non closed monitoring	Carmeli & Schaubroeck (2007); Tierney & Farmer (2004); Zhou (2003)
Leader-members exchange	Scott & Bruce (1994); Woodman, Sawyer, & Griffin (1993)

<i>Size (±)</i>	Amabile (1997); Amabile & Pratt (2016); Woodman et al., (1993); <i>Kimberly and Evanisko, 1981; Mol and Birkinshaw, 2009; Vaccaro, Jansen, Van Den Bosch, Volberda (2012)</i>
Resources	Amabile (1997); Amabile & Pratt (2016)
Challenging tasks	Amabile (1997); Amabile & Pratt (2016)
Freedom	Amabile (1997); Amabile & Pratt (2016)
Workload pressure (+/-)	Amabile (1997); Amabile & Pratt (2016)
Organizational impediments	Woodman, Sawyer, & Griffin (1993)
Norms	Ford (1996); Woodman, Sawyer, & Griffin (1993)
Cohesiveness	Woodman, Sawyer, & Griffin (1993)
Diversity	Woodman, Sawyer, & Griffin (1993)
Role tasks	Woodman, Sawyer, & Griffin (1993)
Rewards	Woodman, Sawyer, & Griffin (1993)
Strategy	Woodman, Sawyer, & Griffin (1993)
Structure	Woodman, Sawyer, & Griffin (1993)
Technology	West (1990)
Participative safety	Tierney & Farmer, 2011; (-) Yuan & Woodman, 2010
Job required creativity	Hackman & Oldham, 1980
Job complexity	Hackman & Oldham, 1981
Equity	Ramamoorthy & Flood (2005)
Meritocracy	Ramamoorthy & Flood (2005)
Procedural justice	Ramamoorthy & Flood (2005)
Physical conditions (furnitures, windows...)	Dul & Ceylan (2010)

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*Note.* Variables in italic have been subject to research on managerial creativity. Related references are in italic.



## **Appendix 2.2. Development of the French Organizational Climate for Creativity and Innovation Scale (OCCIS)**

**Figure 1.4.1.** Poster presented at the 17<sup>th</sup> congress of the European Association of Work and Organizational Psychology – Oslo, Norway

**Figure 1.4.2.** Poster presented at the 18<sup>th</sup> congress of the European Association of Work and Organizational Psychology – Dublin, Ireland.

# Organizational climate for creativity and innovation: Validation of a taxonomy

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## INTRODUCTION

Hunter, Bedell and Mumford (2005; 2007) proposed a general taxonomy of dimensions of organizational climate enhancing creativity and innovation.

This taxonomy encompasses all existing theoretical models and postulates that 14 different dimensions predict creative performance and innovation: Positive peer group; Positive supervisor relation; Resources; Challenge; Mission clarity; Autonomy; Positive interpersonal exchange; Intellectual stimulation; Top management support; Reward orientation; Flexibility and risk-taking; Product Emphasis; Participation; and Organizational integration.

The objective is to validate such a taxonomy.

## METHOD

### Subjects

- 192 employees in several organizations
- 50% of female and 50% of male
- 15% of managers and 85% of non managers
- Age: M = 37.9; SD = 12.4

### Material

Questionnaire administered online:

- 164 items supposed to evaluate respectively the 14 different dimensions of the taxonomy.
- Two scales from the KEYS (Amabile et al., 1996): Creativity and Productivity.

## RESULTS

### Exploratory factor analysis

- 1) From the 164 items, 64 were removed as they showed deviant skew and kurtosis.
- 2) For each dimensions of the taxonomy, only the 5 more consistent items were selected.
- 3) A principal component analysis revealed the existence of only 4 dimensions (42% of variance explained) interpreted as:
  - Organizational and supervisory encouragement for creativity and innovation (ENCO)
  - Organizational impediments (IMPE)
  - Positive interpersonal exchange (PIEX)
  - Mission clarity & organizational integration (MCOI)

## Validation

Results showed different patterns of relationship between the 4 factors and the two external criteria of Creativity (CREA) and Productivity (PROD).

TABLE 1: Correlations between factors of organizational climate and two criteria

	1	2	3	4	5	6
1. ENCO	(.94)					
2. IMPE	.73**	(.89)				
3. PIEX	.60**	.64**	(.85)			
4. MCOI	.59**	.59**	.67**	(.86)		
5. CREA	.77**	.64**	.47**	.50**	(.97)	
6. PROD	.52**	.44**	.64**	.69**	.46**	(.94)

\*\* Significant at .001

TABLE 2: Regression Analyses for the Creativity and Productivity criteria

Predictor	Creativity criteria			Productivity criteria		
	$\beta$	t	p	$\beta$	t	p
ENCO	.650	9.289	.000	.163	2.158	.032
IMPE	.184	2.560	.011	-.174	-2.240	.026
PIEX	-.076	-1.116	.266	.337	4.611	.000
MCOI	.058	0.895	.372	.471	6.697	.000
Model:	F(4,187) = 74.549 ; R <sup>2</sup> = .615			F(4,187) = 57.361 ; R <sup>2</sup> = .551		

## CONCLUSION

These preliminary results do not confirm the hypothesis that the organizational climate for creativity and innovation could be described under 14 different dimensions.

Nevertheless, the two first factors (Organizational and supervisory encouragement for creativity and innovation, and Organizational impediments), are consistent with some dimensions already identified by Amabile, Conti, Coon, Lazenby, and Herron (1996). The third one correspond exactly to the dimension Positive interpersonal exchange postulated by Hunter, Bedell and Mumford (2005; 2007), and the last one aggregate two distinct dimensions (Mission clarity & Organizational integration) identified by these authors.

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# Organizational climate for creativity and innovation: Toward a bi-factorial model

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Different models emphasized the effects of organizational climate on creative and innovative performance in organizations (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Ekvall, 1996; Anderson & West, 1998). However, these models focused on different numbers and types of climate dimensions. More recently, Hunter, Bedell and Mumford (2005, 2007) proposed a taxonomy composed of 14 different dimensions that synthesize all results from researches previously published on organizational climate for creativity and innovation. The purpose of the present study is to test the validity of such taxonomy in order to develop a more general model.

Caroff, Massu, Kratseva and Houssin (2015) developed the French Organizational Climate for Creativity and Innovation Scale (OCCIS) composed of 24 items based on Hunter et al. (2005) definitions. These items respectively assess four different dimensions: Encouragement and organizational support, Positive interpersonal relations, Autonomy and challenge, and Mission clarity.

## Method

The OCCIS has been administered online to employees in several organizations:

- 663 managers: 25% female;  $M_{age} = 41$ ,  $SD = 9$
- 271 non managers: 54% female;  $M_{age} = 37$ ,  $SD = 12$

Some participants also complete different scales: two scales (Creativity and Productivity) from the KEYS (Amabile, & al., 1996), the Frequency of Innovation Survey (Community Innovation Survey, 2014), the Innovative Behaviors Scale (Janssen, 2000), the Innovative Work Behaviour Measure (Dorenbosch, Engen, Van, & Verhagen, 2005), the Creative Self-Efficacy Scale (Tierney & Farmer, 2002), and the Too Busy for New Ideas Scale (Basadur & Hausdorf, 1996).

## Results

### Confirmatory factor analysis (see Table 1)

CFA was carried out with the lavaan package (Rosseel, 2012) running in R. Results show that a bifactor model with a general factor loading on all items and four unrelated group factors was a closer fit to the data than the one-factor or four-factor models. To improve the fit of the bifactor model, modification indices suggested freeing the residual covariance between two items assessing Autonomy and challenge (model 4).

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Tests of measurement invariance across participants' situation (managers and non-managers) were carried with multigroup CFA. These analyses indicate that configural invariance (model 5) is supported while metric invariance (model 6) is just significant (Cheung & Rensvold, 2002).

Table 1

Goodness-of-Fit Statistics for CFA Models of the French Creative Climate Scale

Models	$\chi^2$	df	RMSEA	SRMR	CFI	Comp.	$\Delta\chi^2$	$\Delta df$	$\Delta RMSEA$	$\Delta SRMR$	$\Delta CFI$
1. One-factor	3680.9*	252	.121	.091	.675						
2. Four-factor	1107.3*	246	.061	.051	.918	2 vs 1	2573.6*	6			
3. Bifactor	842.8*	228	.054	.040	.942	3 vs 2	264.49*	18			
Managers	702.6*	228	.056	.043	.931						
Collaborators	470.9*	228	.063	.052	.924						
4. Bifactor (modified)	707.2*	227	.048	.035	.954	4 vs 2	400.1*	19			
Managers	610.7*	227	.050	.040	.945						
Collaborators	430.5*	227	.058	.045	.936						
5. Configural	1041.2*	454	.053	.040	.942						
6. Metric	1198.6*	502	.055	.078	.931	6 vs 5	157.4*	48	.002	.038	.011
7. Scalar	1251.7*	521	.055	.079	.928	7 vs 6	53.2*	19	.000	.001	.003
8. Residual	1633.1*	545	.065	.093	.892	8 vs 7	381.4*	24	.011	.014	.035

Legend: RMSEA = root mean square error of approximation; SRMR = Standardized Root Mean Square Residual; CFI = comparative fit index; Comp. = Model comparison;  $\Delta CFI$  = CFI difference;  $\Delta SRMR$  = SRMR difference;  $\Delta RMSEA$  = RMSEA difference. \*  $p < .001$ .

### Validity of the scale (see Table 2)

Correlation analysis confirms the validity of the general factor score in regard to the seven criteria used to assess creativity and innovation in organizations. However, results show different patterns of relationship between the four group factors (Encouragement and organizational support, Positive interpersonal relations, Autonomy and challenge, and Mission clarity) and those criteria.

Table 2

Correlations between the French Organizational Climate for Creativity and Innovation Scale (factors scores) and several criteria assessing creativity and innovation

Criteria	N	Managers					Non-managers				
		General	SUPP	RELA	CHAL	CLAR	General	SUPP	RELA	CHAL	CLAR
KEY-C	30	.79**	.35	-.03	.25	-.10	163	.73**	.48**	-.17*	.28**
KEY-P	30	.61**	.29	.13	.11	.51**	163	.63**	.13	.18*	.28**
FI	129	.32**	.22*	.16	.06	.08	108	.19	-.01	-.05	.13
IB	129	.22*	.10	.02	.10	-.16	108	.22*	.05	.21*	.23*
TBNI	129	-.24**	.02	-.24**	-.03	-.04	108	-.13	-.12	-.01	-.07
IWB	191	.46**	.20**	.05	.09	-.10					
CSE	191	.38**	-.11	.15*	.19**	.06					

Legend: KEY-C = Creativity score from the KEY; KEY-P = Productivity score from the KEY; FI = Frequency of innovation; IB = Innovative Behaviors; TBNI = Too Busy for New Ideas; IWB = Innovative Work Behaviour; CSE = Creative Self-Efficacy; General = General factor; SUPP = Encouragement and organizational support; REL = Positive interpersonal relations; CHAL = Autonomy and challenge; CLAR = Mission clarity. \*\*  $p < 0.01$ , \*  $p < 0.05$ .

## Conclusion

Results from the research lead to conclude that the organizational climate for creativity and innovation is certainly composed of significantly fewer dimensions than those postulated by the taxonomy of Hunter et al. (2005, 2007), even if we notice that several original dimensions from this taxonomy are probably nested in more general factors.

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# Appendix 3. Chapter 4:

## Implicit theories of managerial creativity and innovation

### Appendix 3.1. Attributes of creativity related to managerial activities (*N* = 87)

*Words are presented in decreasing order of frequency. Frequency and mean rank are presented in parentheses.*

innovation (26; 2.50)	idée (5; 2.20)	challenge (4; 3.50)
écoute (25; 2.00)	partage (5; 3.00)	inventivité (3; 1.33)
ouverture (15; 1.73)	brainstorming (4; 1.50)	liberté (3; 1.33)
curiosité (11; 1.73)	proactivité (4; 1.75)	audace (3; 1.67)
sortir du cadre (8; 1.75)	communication (4; 2.00)	équipe (3; 1.67)
adaptabilité (8; 2.75)	nouveauté (4; 2.00)	implication (3; 1.67)
dynamique (7; 2.29)	proposition (4; 2.25)	esprit d'équipe (3; 2.00)
motivation (7; 2.57)	stratégie (4; 2.25)	indispensable (3; 2.00)
participation (7; 2.71)	formation (4; 2.50)	courage (3; 2.33)
changement (7; 3.00)	connaissance (4; 2.75)	exemplarité (3; 2.33)
imagination (6; 1.67)	disponibilité (4; 2.75)	inspiration (3; 2.33)
anticipation (6; 2.17)	humour (4; 2.75)	analyse (3; 2.67)
organisation (6; 2.33)	responsabilité (4; 2.75)	enthousiasme (3; 2.67)
confiance (6; 2.50)	spontanéité (4; 2.75)	ambition (3; 3.00)
initiative (6; 2.50)	amélioration (4; 3.00)	originalité (3; 3.00)
vision (6; 2.50)	recherche (4; 3.00)	réactivité (3; 3.00)
échange (5; 2.00)	valeur (4; 3.25)	polyvalence (3; 3.33)

décision (3; 4.00)	compétence (2; 2.50)	relation (2; 3.00)
autonomie (2; 1.00)	création (2; 2.50)	respect (2; 3.00)
methode (2; 1.00)	encadrement (2; 2.50)	souplesse (2; 3.00)
nécessaire (2; 1.00)	épanouissement (2; 2.50)	cadre (2; 3.50)
expérience (2; 1.50)	exigence (2; 2.50)	fédérateur (2; 3.50)
bienveillance (2; 2.00)	pertinence (2; 2.50)	merchandising (2; 3.50)
coaching (2; 2.00)	reconnaissance (2; 2.50)	réflexion (2; 3.50)
délégation (2; 2.00)	rigueur (2; 2.50)	soutien (2; 3.50)
efficience (2; 2.00)	valorisation (2; 2.50)	construction (2; 4.00)
projet (2; 2.00)	différence (2; 3.00)	ingéniosité (2; 4.00)
remise en question (2; 2.00)	évolution (2; 3.00)	leadership (2; 4.00)
cohésion (2; 2.50)	oser (2; 3.00)	
	recul (2; 3.00)	



## Appendix 3.2. Attributes of innovation related to managerial activities (N = 87)

*Words are presented in decreasing order of frequency. Frequency and mean rank are presented in parentheses.*

écoute (26; 2.46)	changement (4; 2.25)	liberté (3; 2.67)
créativité (22; 1.68)	remise en question (4; 2.25)	organisation (3; 3.00)
recherche (11; 2.45)	développement (4; 2.50)	réactivité (3; 3.00)
nouveauté (10; 2.40)	initiative (4; 2.50)	suivi (3; 3.00)
communication (9; 2.33)	performance (4; 2.50)	implication (3; 4.00)
formation (9; 3.00)	risque (4; 2.75)	brainstorming (2; 1.50)
ouverture (8; 2.00)	participation (4; 3.25)	enthousiasme (2; 1.50)
curiosité (7; 2.00)	responsabilité (4; 3.25)	expertise (2; 1.50)
imagination (6; 1.50)	rigueur (4; 3.25)	feedback (2; 1.50)
sortir du cadre (6; 2.17)	disponibilité (4; 3.50)	leadership (2; 1.50)
anticipation (6; 2.67)	dialogue (3; 1.67)	proximité (2; 1.50)
progrès (6; 3.00)	empathie (3; 1.67)	analyse (2; 2.00)
avenir (5; 1.60)	respect (3; 1.67)	coopération (2; 2.00)
vision (5; 2.20)	flexibilité (3; 2.00)	créatif (2; 2.00)
motivation (5; 2.40)	nécessaire (3; 2.00)	équipe (2; 2.00)
adaptabilité (5; 2.60)	agilité (3; 2.33)	évaluation à 360 (2; 2.00)
accompagnement (5; 2.80)	coaching (3; 2.33)	marché (2; 2.00)
objectif (5; 3.00)	collaboration (3; 2.33)	opportunité (2; 2.00)
amélioration (4; 1.00)	échange (3; 2.33)	bien être (2; 2.50)
transversalité (4; 1.75)	autonomie (3; 2.67)	management participatif (2; 2.50)
courage (4; 2.00)	confiance (3; 2.67)	partenariat (2; 2.50)
création (4; 2.00)	connaissance (3; 2.67)	reporting (2; 2.50)
audace (4; 2.25)		

sécurité (2; 2.50)	positif (2; 3.00)	ensemble (2; 3.50)
avancée (2; 3.00)	précision (2; 3.00)	investissement (2; 3.50)
créer (2; 3.00)	rapidité (2; 3.00)	modernité (2; 3.50)
défi (2; 3.00)	rentabilité (2; 3.00)	réflexion (2; 3.50)
déléguer (2; 3.00)	visibilité (2; 3.00)	service (2; 3.50)
exemplarité (2; 3.00)	développement personnel	structure (2; 3.50)
humanité (2; 3.00)	(2; 3.50)	ambition (2; 4.00)

**Appendix 3.3. Translation of the creative behavior scale developed by George and Zhou (2001) and factor loadings based on a principle component analysis with varimax rotation**



Original version (George & Zhou, 2001)	French translation	Comp. 1. Creativity	Comp. 2. Managerial creativity	Comp. 3. Management of creativity
Suggests new ways to achieve goals or objectives	Je propose de nouvelles façons d'atteindre les buts et les objectifs au travail		.68	
Comes up with new and practical ideas to improve performance	Je propose des idées nouvelles et utiles pour améliorer la performance au travail		.73	
Searches out new technologies, processes, technique, and/or product ideas	Je cherche de nouvelles technologies, procédures, techniques, et/ou de nouvelles idées de produit	.48	.33	
Suggests new ways to increase quality	Je suggère de nouvelles façons d'améliorer la qualité au travail		.82	
Is a good source of creative ideas	Je suis une bonne source d'idées créatives au travail	.75		
Not afraid to take risks	Je n'ai pas peur de prendre des risques au travail	.33		.67
Promotes and champions ideas to others	Je promeus et défends les idées auprès des autres au travail			.81
Exhibits creativity on the job when given the opportunity to	J'exprime de la créativité au travail quand j'en ai l'opportunité	.61		.51
Develops adequate plans and schedules for the implementation of new ideas	Je développe des stratégies et des plannings adaptés pour implémenter de nouvelles idées au travail		.43	.57
Often has new and innovative ideas	J'ai souvent des idées nouvelles et innovantes au travail	.80		
Comes up with creative solutions to problems	Je propose des solutions créatives aux problèmes	.78		
Often has a fresh approach to problems	J'ai souvent une nouvelle approche des problèmes	.68		
Suggests new ways of performing work tasks	Je propose de nouvelles façons de réaliser les tâches au travail		.75	
	SS loadings	3.23	2.70	1.94
	Proportion of variance explained	.25	.21	.15

*Note.* Loadings <.30 have been suppressed.

**Appendix 3.4. Factor loadings based on a principle component analysis with promax rotation for 35 attributes of a creative manager (N = 244)**

	Dim. 1. Active	Dim. 2. Understanding	Dim. 3. Responsible	Dim. 4. Sincere	Dim. 5. Inventive
Active	.75				
Assertive	.75				
Energetic	.72				
Enterprising	.64				
Ambitious	.63			-.35	
Alerte	.57				
Intitiative	.54				
Persevering	.52		.38		
Trusting	.47	.40			
Enthusiastic	.41	.41			
Understanding		.74		.36	
Sociable		.74			-.34
Adaptable		.70			
Cooperative		.69			
Wholesome		.61			
Optimistic	.41	.51			
Interests wide		.41	.37		.31
Responsible			.76		
Demanding	.36	-.42	.64		
Intelligent			.63		
Ingenious			.58		.33
Insightful				0.51	
Clever		.37	.44		
Adventurous	.34		-.41		.40
Curious			.39		.35
Poised			.39	.36	
Sincere				.82	
Honest				.81	
Natural				.73	
Courageous	.51			.59	
Reliable			.38	.56	
Inventive					.84
Imaginative					.80
Informal					.56
Daring	.40				.54
<hr/>					
SS loadings	5.39	4.41	3.67	3.55	2.99
Proportion Var	.15	.13	.10	.10	.09
<hr/>					
	Dim. 1.	Dim. 2.	Dim. 3.	Dim. 4.	Dim. 5.
Dim. 1.	1				
Dim. 2.	.46	1			
Dim. 3.	.38	.36	1		
Dim. 4.	.23	.24	.35	1	
Dim. 5.	.39	.45	.21	-.01	1

*Note.* For all components, attributes are presented in order of their highest loadings and loadings <.30 have been suppressed.

## Appendix 3.5. Creative managerial practices

Label	Creative managerial practice
Instructions	<p>Dans une précédente étude, nous avons recueilli cinq problèmes concrets auxquels des managers ont été confrontés et les solutions qu'ils leurs ont apportées.</p> <p>Nous vous demandons d'évaluer dans quelle mesure ces solutions sont créatives. Vous répondrez en utilisant une échelle allant de 1 (« non, pas du tout ») à 7 (« oui, tout à fait »). Les échelons intermédiaires vous permettront de nuancer votre réponse. Cochez la case qui correspond le mieux à votre réponse.</p>
O1A1	<p><u>Contexte</u> : Organisation du service, besoin d'identifier les dysfonctionnements, difficultés de communication et de partage des compétences, rivalités.</p> <p><u>Solution</u> : Mettre en commun et respecter le parcours de chacun par le biais de réunions participatives.</p>
01A3	<p><u>Contexte</u> : Responsabiliser et améliorer les collaborations entre les salariés.</p> <p><u>Solution</u> : les anciens salariés forment les nouveaux. Les nouveaux les accompagnent sur le terrain, en négociation, pendant 15 jours environ, jusqu'à ce qu'ils soient autonomes.</p>
O2A2	<p><u>Contexte</u> : Motiver et améliorer la productivité.</p> <p><u>Solution</u> : Mutualisation des objectifs, les résultats deviennent communs, alors qu'avant les collaborateurs avaient chacun un objectif propre à atteindre, maintenant c'est un objectif de groupe.</p>
O3A1	<p><u>Contexte</u> : Problème de différences de cultures au sein de l'équipe et donc de discrimination et d'exclusion.</p> <p><u>Solution</u> : Le manager place en cercle les collaborateurs et en exclut une qui a pour consigne de tenter de rentrer dans le cercle. Ceux qui forment le cercle se tiennent par les épaules, ont pour consigne ne pas faire rentrer la personne dans le cercle.</p>
O3A3	<p><u>Contexte</u> : Besoin de motiver les salariés.</p> <p><u>Solution</u> : Le manager les emmène visiter les usines d'un concurrent, voir ce qui se passe ailleurs.</p>

## Appendix 3.6. Study 3: Means, standard deviations and correlations

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. C.B1. Creativity	5.55	0.87																			
2. C.B2. Managerial creativity	5.60	0.91	.53**																		
3. C.B3. Management of creativity	5.60	0.94	.48**	.44**																	
4. O1A1S	4.53	1.61	.04	.20**	.15*																
5. O3A1S	3.91	2.01	.12	.03	.06	-.02															
6. O2A2S	4.34	1.70	.21**	.28**	.15*	.43**	.01														
7. O1A3S	4.28	1.76	.07	.24**	.04	.45**	-.07	.41**													
8. O3A3S	4.87	1.63	.03	.08	-.05	.21**	.08	.18**	.19**												
9. O1A1A	3.88	1.80	.04	.18**	.06	.33**	.09	.14*	.25**	.05											
10. O3A1A	3.59	1.99	.10	.03	.06	.08	.47**	.03	.02	.06	.09										
11. O2A2A	5.04	1.53	.13*	.27**	.10	.33**	.14*	.28**	.26**	.11	.36**	.15*									
12. O1A3A	3.99	1.70	-.08	.09	-.08	.36**	-.17**	.21**	.45**	.17**	.24**	-.06	.25**								
13. O3A3A	4.47	1.62	.08	.08	.04	.22**	.27**	.12	.12	.26**	.33**	.21**	.20**	.16**							
14. Mean production without def	4.42	1.03	.10	.31**	.08	.72**	.01	.62**	.71**	.44**	.57**	.09	.59**	.63**	.33**						
15. Mean production with def	3.99	1.39	.13*	.06	.07	.12	.81**	.07	.02	.17**	.21**	.78**	.22**	-.04	.62**	.17**					
16. C.M1. Active	.00	1.00	.16*	.18**	.21**	.06	.05	.14*	.05	.01	.11	.05	.13*	.06	.11	.13*	.09				
17. C.M2. Understanding	.00	1.00	.10	.18**	.14*	.08	.06	.07	.12	.05	-.01	.05	.09	.04	.02	.10	.06	.24**			
18. C.M3. Responsible	.00	1.00	.21**	.16*	.19**	-.01	.01	.11	-.01	-.09	.04	.01	.03	-.05	.10	.01	.05	.36**	.36**		
19. C.M4. Sincere	.00	1.00	.25**	.20**	.17**	.07	.05	.08	.02	-.04	.12	.09	.09	-.00	.13*	.08	.11	.46**	.28**	.38**	
20. C.M5. Inventive	.00	1.00	.32**	.15*	.09	.01	.18**	.10	-.06	.00	.06	.14*	.04	-.00	.07	.03	.18**	.41**	.01	.22**	.42**

Notes. C.B = Creative behaviors, def = definition, C.M = Characteristics of a creative manager. M = Mean, SD = Standard deviation. \*  $p < .05$ , \*\*  $p < .01$ .

## Appendix 3.7. Items partioning characteristics

Items	$\eta^2$	P-value
Curiosity	0.31	***
Imagination	0.28	***
Organization	0.25	***
Thinking outside the framework	0.25	***
Anticipation	0.22	***
Innovation	0.22	***
Trust	0.21	***
Interaction	0.19	***
Openness	0.18	***
Communication	0.16	***
Novelty	0.14	***
Listening	0.14	***
Strategy	0.11	***
Brainstorming	0.11	***
Ideas	0.09	***
Motivation	0.09	***
Initiative	0.08	***
Participation	0.07	***
Vision	0.07	***
Proactivity	0.07	***
Change	0.06	***
Dynamism	0.05	**

*Note.* \*\*  $p < .01$ , \*\*\*  $p < .001$

# Appendix 4. Chapter 5: Why and when should managers be creative?

## Appendix 4.1. Study 4: Factor loadings, AVE, CR and Cronbach's alphas

Construct	Loading	CR	AVE	Alpha
Intentions		.83	.63	.82
J'ai l'intention d'utiliser la démarche créative lorsque je serais confronté(e) à un problème dans les trois prochains mois	.82			
<i>Je suis disposé(e) à essayer la démarche créative</i>				
Je vais essayer de résoudre certaines difficultés auxquelles je suis confronté(e) grâce à la démarche créative.	.84			
<i>Sur l'ensemble des problèmes qui se présentent dans mon travail, je pourrais tenter d'en résoudre en utilisant la démarche créative</i>				
Je vais essayer de résoudre certaines difficultés auxquelles je suis confrontée en étant créatif (ve).	.69			
<i>Plus généralement, j'ai l'intention d'utiliser ma créativité dans mon travail.</i>				
Attitudes toward the use of DT-CT		.85	.58	.84
<i>Selon moi, la démarche créative est Utile - Inutile</i>				
<i>Selon moi, la démarche créative est Idéaliste - Constructive</i>				
<i>Selon moi, la démarche créative est Inefficace - Efficace</i>				
<i>Selon moi, la démarche créative est Simple - Compliquée</i>				
<i>Selon moi, la démarche créative est Banale - Originale</i>				
<i>Selon moi, la démarche créative est Adaptée - Inadaptée</i>				
Selon moi, la démarche créative est Ennuyeuse - Captivante	.74			
Selon moi, la démarche créative est Pénible - Amusante	.78			
Selon moi, la démarche créative est Déplaisante - Plaisante	.82			
Selon moi, la démarche créative est Insatisfaisante - Satisfaisante	.71			
Perceived autonomy		.88	.64	.87
Si je souhaitais utiliser la démarche créative, je n'aurai pas à en informer quelqu'un au préalable	.69			
Je suis libre d'utiliser la démarche que je souhaite pour résoudre les problèmes auxquels mon équipe et moi sommes confrontés.	.82			

Construct	Loading	CR	AVE	Alpha
Si je le souhaitais, je pourrais utiliser la démarche créative dans les 3 mois qui viennent.	.78			
Je pense pouvoir décider librement d'utiliser, ou non, la démarche créative.	.93			
Perceived capacity		.74	.50	.84
Je n'ai pas eu de difficulté à trouver de nombreuses idées pour relever le challenge	.62			
Proposer une solution créative pour relever le challenge a été facile pour moi	.61			
Je me sens capable d'utiliser la démarche créative efficacement.	.83			
<i>Je suis confronté(e) à de nombreuses situations où je pourrais utiliser la démarche créative.</i>				
Je suis assez créatif pour utiliser la démarche créative.	.79			
Injunctive norms		.67	.51	.67
<i>La plupart des personnes qui sont importantes pour moi dans mon environnement professionnel ne comprendraient pas que j'utilise la démarche créative</i>				
<i>Au sein de mon organisation, la plupart des personnes pensent qu'il faut développer l'utilisation de démarches telles que la démarche créative</i>				
<i>La plupart des personnes qui me ressemblent aurait une mauvaise image de moi si j'utilisais la démarche créative</i>				
La plupart des personnes que je respecte dans mon entreprise pensent qu'il est approprié que j'utilise une démarche telle que la démarche créative lorsque je suis confronté(e) à un problème.	.64			
Mon entourage professionnel serait favorable à ce que j'utilise une démarche telle que la démarche créative	.79			
Descriptive norms		.77	.53	.77
Dans mon organisation, la plupart des managers utilisent des démarches semblables à la démarche créative lorsqu'ils sont confrontés à des problèmes. (Pas du tout d'accord- Tout à fait d'accord)	.73			
Dans mon organisation, on encourage les managers à être créatif	.73			
Mon cercle professionnel proche teste et utilise des démarches créatives	.71			
<i>Dans mon organisation, la démarche créative est (Inexistante - Très répandue)</i>				
Promotion focus		.77	.52	.77
Au travail, je saisis les occasions pour maximiser mes perspectives d'évolution.	.77			
<i>Pour réussir, j'ai tendance à prendre des risques au travail.</i>				
<i>Si j'avais une opportunité de participer à un projet à haut risque et à récompense élevée, je la saisisrais certainement.</i>				



Construct	Loading	CR	AVE	Alpha
Si mon poste de travail n'offrait pas d'opportunités d'avancement professionnel, j'en chercherais probablement un nouveau.	.68			
<i>L'opportunité de me développer est un facteur important pour moi quand je cherche un emploi.</i>				
Je me concentre sur l'accomplissement d'activités professionnelles qui vont favoriser ma promotion.	.73			
<i>Je passe énormément de temps à prévoir comment réaliser mes aspirations.</i>				
<i>Mes priorités au travail sont déterminées par une vision claire de ce que j'aspire à être.</i>				
<i>Au travail, je suis motivé(e) par mes espoirs et mes aspirations.</i>				
Prevention focus		.84	.48	.72
Je me concentre sur le fait d'effectuer correctement mes activités professionnelles pour augmenter la sécurité de mon emploi.	.72			
Au travail, je concentre mon attention sur le fait de remplir les tâches qui me sont assignées.	.55			
<i>Accomplir mes obligations professionnelles est très important pour moi.</i>				
<i>Au travail, je m'efforce de respecter les responsabilités et les obligations qui me sont assignées par d'autres personnes.</i>				
<i>Au travail, je suis souvent concentré(e) sur l'accomplissement des tâches qui subviennent à mon besoin de sécurité.</i>				
<i>Je fais tout ce que je peux pour éviter les problèmes au travail.</i>				
<i>La sécurité de l'emploi est un facteur important pour moi dans n'importe quelle recherche d'emploi.</i>				
Je concentre mon attention sur le fait d'éviter les échecs au travail.	.59			
Je suis très prudent afin d'éviter de m'exposer à de potentiels préjudices au travail.	.85			
Attitudes toward ideation		.60	.33	.59
<i>Je pense que les personnes au travail doivent être encouragées à partager toutes leurs idées, car on ne sait jamais quand quelqu'un qui nous paraît fantaisiste pourrait se révéler être le meilleur.</i>				
<i>Une nouvelle idée vaut dix anciennes.</i>				
Je pense que tout le monde devrait dire tout ce qui lui traverse l'esprit quand cela est possible.	.47			
Je tiens à écouter les idées farfelues des autres personnes car les plus fantaisistes mènent souvent à la meilleure solution	.65			
Je pense qu'on doit accorder autant de temps à toutes les idées, et les écouter avec l'esprit ouvert, même pour les idées les plus loufoques.	.65			
<i>La meilleure façon de générer de nouvelles idées est d'écouter celles des autres, puis de les relier ou de les agréger entre-elles.</i>				
Tendency for premature evaluation		.77	.53	.75
<i>Je devrais pré-juger mes idées avant de les dire aux autres.</i>				

Construct	Loading	CR	AVE	Alpha
<i>Nous devrions arrêter d'exploiter les idées quand elles sont ridicules et passer à autre chose.</i>				
<i>La qualité est beaucoup plus importante que la quantité de nouvelles idées.</i>				
<i>Un groupe doit être concentré et sur la bonne voie pour produire des idées intéressantes.</i>				
<i>Beaucoup de temps peut être perdu sur des idées fantaisistes</i>				
Le jugement est nécessaire durant la génération d'idée pour s'assurer que seulement la qualité des idées est développée	.78			
Vous devez être fiable afin de détecter et éliminer les idées fantaisistes lors de la génération de nouvelles idées.	.84			
Je souhaite que les personnes réfléchissent sur le caractère pratique de leur idée avant d'ouvrir leur bouche.	.51			
Organizational climate		.88	NA	.83
N1	.43			
N2	.19			
N3	.43			
N4	.47			
N5	.30			
N6	.44			
N7	.49			
N8	.30			
N9	.46			
N10	.49			
N11	.43			
N12	.34			
N13	.38			
N14	.22			
N15	.42			
N16	.49			
N17	.53			
N18	.58			
N19	.50			
N20	.60			
N21	.54			
N22	.43			
N23	.46			
N24	.68			
Organizational support		.71	NA	.78
N1	.48			
N2	.56			
N3	.67			
N4	.42			
N5	.49			
N6	.31			

Construct	Loading	CR	AVE	Alpha
Positive interpersonal relationships		.71	NA	.80
N7	.48			
N8	.51			
N9	.53			
N10	.50			
N11	.45			
N12	.46			
Challenge and autonomy		.72	NA	.85
N13	.30			
N14	.70			
N15	.67			
N16	.53			
N17	.37			
N18	.17			
Mission clarity		.58	NA	.74
N19	.39			
N20	.46			
N21	.25			
N22	.54			
N23	.12			
N24	.57			

*Note.* M, SD, CR and AVE are used to represent means and standard deviations, composite reliabilities and average variances extracted respectively. Items in italics have been removed before testing the hypotheses.

## Appendix 4.2. Study 4: Lavaan output of Structural Equation Modelling

	lhs	op	rhs	label	est	se	z	pvalue	ci.lower	ci.upper
1	PrematEval	=	EC6		1.00	0.00			1.00	1.00
2	PrematEval	=	EC7		1.04	0.12	8.56	0.00	0.80	1.28
3	PrematEval	=	EC8		0.59	0.09	6.75	0.00	0.42	0.76
4	RFM	=	RF10MG		1.00	0.00			1.00	1.00
5	RFM	=	RF13MA		1.07	0.13	8.48	0.00	0.82	1.32
6	RFM	=	RF15MA		0.99	0.12	8.47	0.00	0.76	1.22
7	Support	=	TMS41		1.00	0.00			1.00	1.00
8	Support	=	RWO51		1.18	0.21	5.76	0.00	0.78	1.58
9	Support	=	RWO31		1.35	0.20	6.71	0.00	0.95	1.74
10	Support	=	RES51		0.84	0.16	5.40	0.00	0.54	1.15
11	Support	=	PRE51		0.92	0.17	5.41	0.00	0.59	1.26
12	Support	=	FRT111		0.61	0.14	4.28	0.00	0.33	0.89
13	Interperso	=	PIE10R3		1.00	0.00			1.00	1.00
14	Interperso	=	PIE1R3		0.97	0.18	5.34	0.00	0.62	1.33
15	Interperso	=	PIE123		0.96	0.15	6.36	0.00	0.66	1.25
16	Interperso	=	PPG33		0.75	0.13	5.94	0.00	0.50	1.00
17	Interperso	=	PPG93		0.89	0.14	6.26	0.00	0.61	1.16
18	Interperso	=	PPG63		0.83	0.13	6.47	0.00	0.58	1.08
19	Chall	=	AUT14		1.00	0.00			1.00	1.00
20	Chall	=	CHA104		2.12	0.34	6.17	0.00	1.45	2.79
21	Chall	=	CHA14		1.67	0.27	6.11	0.00	1.13	2.21
22	Chall	=	CHA114		1.04	0.19	5.42	0.00	0.66	1.41
23	Chall	=	CHA8R4		1.18	0.26	4.63	0.00	0.68	1.68
24	Chall	=	AIT44		0.80	0.16	4.88	0.00	0.48	1.12
25	Tot	=	TMS41		1.00	0.00			1.00	1.00
26	Tot	=	RWO51		0.56	0.18	3.05	0.00	0.20	0.93
27	Tot	=	RWO31		0.93	0.17	5.62	0.00	0.61	1.25
28	Tot	=	RES51		0.99	0.19	5.26	0.00	0.62	1.36
29	Tot	=	PRE51		0.76	0.18	4.30	0.00	0.41	1.11
30	Tot	=	FRT111		0.86	0.18	4.74	0.00	0.51	1.22
31	Tot	=	MIC72		1.48	0.28	5.34	0.00	0.93	2.02
32	Tot	=	ORI4R2		1.13	0.24	4.63	0.00	0.65	1.61
33	Tot	=	ORI12		1.22	0.24	5.04	0.00	0.75	1.70
34	Tot	=	MIC8R2		1.56	0.29	5.42	0.00	1.00	2.13
35	Tot	=	ORI22		1.23	0.26	4.67	0.00	0.72	1.75
36	Tot	=	MIC11R2		1.39	0.28	5.02	0.00	0.85	1.93
37	Tot	=	PIE10R3		0.65	0.20	3.31	0.00	0.26	1.03
38	Tot	=	PIE1R3		0.56	0.21	2.65	0.01	0.14	0.97
39	Tot	=	PIE123		0.70	0.18	3.80	0.00	0.34	1.05
40	Tot	=	PPG33		0.98	0.20	4.79	0.00	0.58	1.37
41	Tot	=	PPG93		0.90	0.20	4.48	0.00	0.51	1.30
42	Tot	=	PPG63		0.87	0.19	4.64	0.00	0.50	1.24
43	Tot	=	AUT14		0.61	0.15	3.96	0.00	0.31	0.91
44	Tot	=	CHA104		1.00	0.20	4.92	0.00	0.60	1.40

45	Tot	=	CHA14		0.88	0.18	4.88	0.00	0.52	1.23
46	Tot	=	CHA114		0.59	0.13	4.46	0.00	0.33	0.86
47	Tot	=	CHA8R4		0.94	0.21	4.54	0.00	0.53	1.34
48	Tot	=	AIT44		1.08	0.21	5.06	0.00	0.66	1.49
49	Att	=	ATT7		1.00	0.00			1.00	1.00
50	Att	=	ATT8		1.07	0.09	11.68	0.00	0.89	1.25
51	Att	=	ATT9		0.91	0.07	12.21	0.00	0.77	1.06
52	Att	=	ATT10		0.73	0.07	10.55	0.00	0.60	0.87
53	ND	=	ND1		1.00	0.00			1.00	1.00
54	ND	=	ND2		1.20	0.15	7.97	0.00	0.91	1.50
55	ND	=	ND3		1.02	0.13	7.95	0.00	0.77	1.27
56	Auto	=	AUTO1		1.00	0.00			1.00	1.00
57	Auto	=	AUTO2		0.93	0.08	11.36	0.00	0.77	1.10
58	Auto	=	AUTO4		1.11	0.10	11.42	0.00	0.92	1.31
59	Capa	=	CAPA1		1.00	0.00			1.00	1.00
60	Capa	=	CAPA2		0.91	0.07	12.63	0.00	0.77	1.06
61	Capa	=	CAPA3		1.05	0.12	8.94	0.00	0.82	1.28
62	Capa	=	CAPA5		1.16	0.13	9.12	0.00	0.91	1.41
63	INT	=	INT1		1.00	0.00			1.00	1.00
64	INT	=	INT3		0.86	0.07	12.22	0.00	0.72	1.00
65	INT	=	INT5		0.73	0.07	10.34	0.00	0.59	0.86
66	INT	-	Att	a	0.28	0.06	4.70	0.00	0.16	0.40
67	INT	-	Capa		0.39	0.09	4.17	0.00	0.21	0.57
68	INT	-	Auto		0.09	0.06	1.45	0.15	-0.03	0.20
69	INT	-	ND	a	0.28	0.06	4.70	0.00	0.16	0.40
70	INT	-	RFM		0.15	0.09	1.78	0.08	-0.02	0.32
71	INT	-	PrematEval		0.06	0.06	0.95	0.34	-0.06	0.18
72	INT	-	NBIdee		0.00	0.02	0.11	0.91	-0.03	0.04
73	INT	-	SCOCREA		0.03	0.10	0.30	0.76	-0.16	0.22
74	INT	-	Tot		0.17	0.14	1.21	0.23	-0.10	0.43
75	INT	-	Support		-0.11	0.12	-0.93	0.35	-0.35	0.13
76	INT	-	Interperso		-0.18	0.11	-1.55	0.12	-0.40	0.05
77	INT	-	Chall		-0.15	0.20	-0.74	0.46	-0.54	0.24
78	Att	-	RFM	b	0.27	0.07	3.63	0.00	0.12	0.42
79	Att	-	PrematEval		-0.03	0.06	-0.42	0.68	-0.15	0.10
80	Att	-	NBIdee		0.02	0.02	1.14	0.25	-0.02	0.06
81	Att	-	SCOCREA		-0.03	0.10	-0.32	0.75	-0.23	0.17
82	Att	-	Tot		0.08	0.14	0.58	0.56	-0.19	0.36
83	Att	-	Support		-0.14	0.13	-1.12	0.26	-0.39	0.11
84	Att	-	Interperso		-0.09	0.12	-0.77	0.44	-0.31	0.14
85	Att	-	Chall		-0.02	0.20	-0.12	0.91	-0.42	0.37
86	Capa	-	RFM		0.17	0.09	2.03	0.04	0.01	0.34
87	Capa	-	PrematEval		-0.05	0.06	-0.73	0.46	-0.17	0.08
88	Capa	-	NBIdee		0.07	0.02	3.36	0.00	0.03	0.10
89	Capa	-	SCOCREA		0.18	0.10	1.70	0.09	-0.03	0.38
90	Capa	-	Tot		0.00	0.14	0.02	0.98	-0.27	0.28

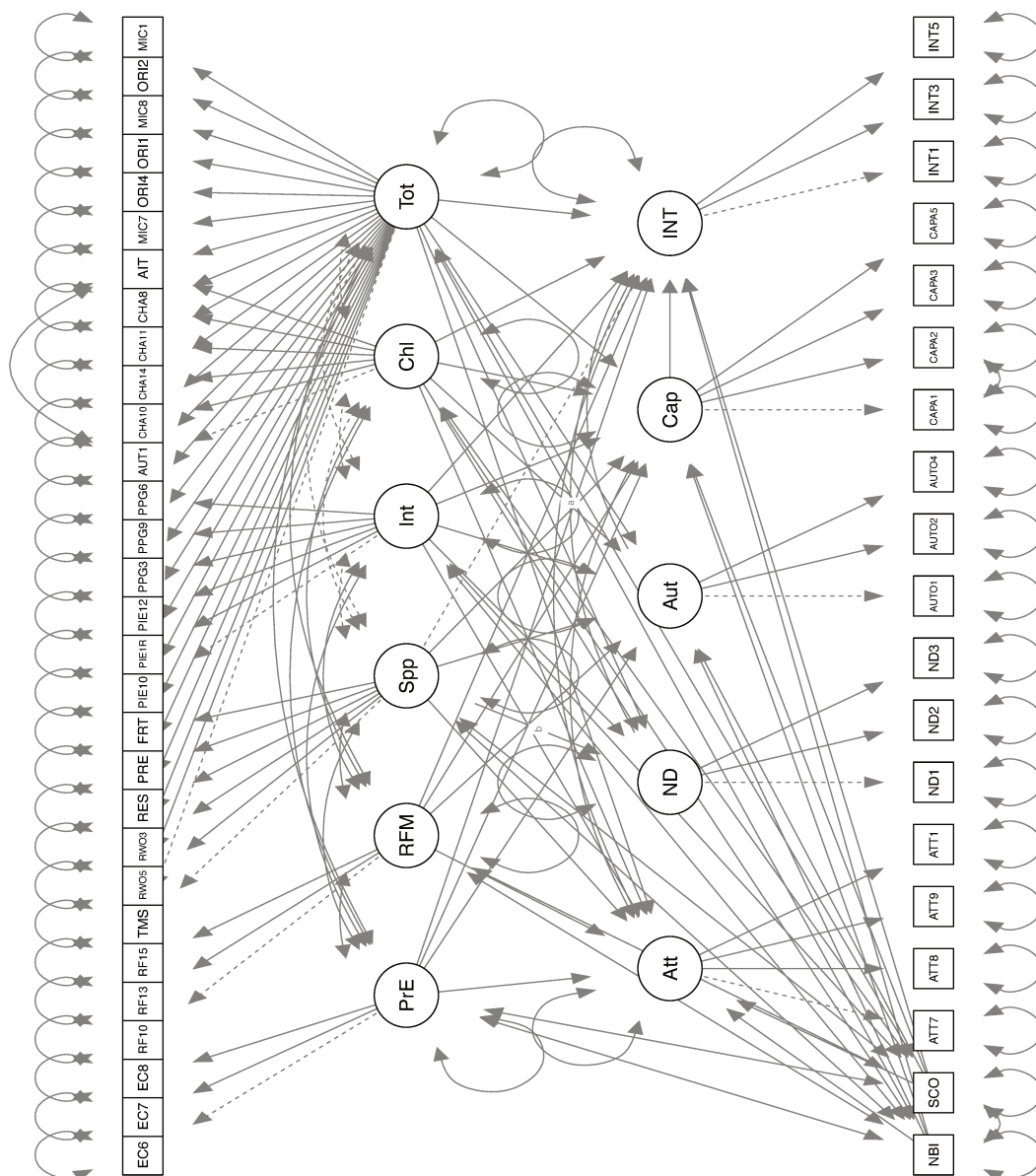


91	Capa	-	Support	0.15	0.13	1.23	0.22	-0.09	0.40
92	Capa	-	Interperso	-0.15	0.12	-1.25	0.21	-0.37	0.08
93	Capa	-	Chall	0.35	0.21	1.66	0.10	-0.06	0.77
94	Auto	-	RFM	-0.18	0.11	-1.71	0.09	-0.39	0.03
95	Auto	-	PrematEval	-0.16	0.08	-2.03	0.04	-0.32	-0.01
96	Auto	-	NBIdee	0.06	0.02	2.38	0.02	0.01	0.10
97	Auto	-	SCOCREA	0.14	0.13	1.08	0.28	-0.11	0.38
98	Auto	-	Tot	0.04	0.17	0.26	0.80	-0.29	0.38
99	Auto	-	Support	0.19	0.16	1.25	0.21	-0.11	0.50
100	Auto	-	Interperso	0.20	0.14	1.40	0.16	-0.08	0.48
101	Auto	-	Chall	0.32	0.26	1.25	0.21	-0.18	0.82
102	ND	-	Tot	0.22	0.15	1.45	0.15	-0.08	0.53
103	ND	-	Support	0.27	0.07	3.63	0.00	0.12	0.42
104	ND	-	Interperso	0.00	0.12	0.03	0.98	-0.24	0.25
105	ND	-	Chall	0.23	0.22	1.03	0.30	-0.21	0.66
106	Att	--	Capa	0.33	0.08	3.97	0.00	0.17	0.49
107	RFM	--	NBIdee	0.45	0.30	1.50	0.13	-0.14	1.04
108	PrematEval	--	RFM	0.10	0.11	0.90	0.37	-0.12	0.31
109	RFM	--	SCOCREA	-0.09	0.05	-1.63	0.10	-0.20	0.02
110	RFM	--	Tot	-0.00	0.05	-0.09	0.93	-0.10	0.09
111	RFM	--	Support	0.13	0.07	1.92	0.05	-0.00	0.26
112	RFM	--	Interperso	0.04	0.07	0.65	0.52	-0.09	0.18
113	RFM	--	Chall	0.07	0.04	1.87	0.06	-0.00	0.14
114	PrematEval	--	NBIdee	-1.09	0.39	-2.80	0.01	-1.86	-0.33
115	NBIdee	--	SCOCREA	0.04	0.19	0.24	0.81	-0.32	0.41
116	Tot	--	NBIdee	0.07	0.17	0.38	0.70	-0.27	0.41
117	Support	--	NBIdee	0.35	0.23	1.55	0.12	-0.09	0.79
118	Interperso	--	NBIdee	0.03	0.23	0.14	0.89	-0.42	0.49
119	Chall	--	NBIdee	-0.11	0.12	-0.89	0.38	-0.34	0.13
120	PrematEval	--	SCOCREA	-0.21	0.07	-2.92	0.00	-0.35	-0.07
121	PrematEval	--	Tot	-0.09	0.07	-1.30	0.19	-0.21	0.04
122	PrematEval	--	Support	-0.08	0.08	-0.96	0.34	-0.24	0.08
123	PrematEval	--	Interperso	0.11	0.09	1.22	0.22	-0.06	0.27
124	PrematEval	--	Chall	-0.02	0.04	-0.38	0.70	-0.10	0.07
125	Tot	--	SCOCREA	0.01	0.03	0.30	0.77	-0.05	0.07
126	Support	--	SCOCREA	-0.04	0.04	-0.88	0.38	-0.11	0.04
127	Interperso	--	SCOCREA	-0.06	0.04	-1.38	0.17	-0.14	0.03
128	Chall	--	SCOCREA	-0.02	0.02	-0.97	0.33	-0.06	0.02
129	Support	--	Tot	0.00	0.00			0.00	0.00
130	Interperso	--	Tot	0.00	0.00			0.00	0.00
131	Chall	--	Tot	0.00	0.00			0.00	0.00
132	Support	--	Interperso	0.00	0.00			0.00	0.00
133	Support	--	Chall	0.00	0.00			0.00	0.00
134	Interperso	--	Chall	0.00	0.00			0.00	0.00
135	CAPA1	--	CAPA2	0.92	0.14	6.74	0.00	0.65	1.18
136	AUT14	--	AIT44	0.28	0.05	5.20	0.00	0.18	0.39

137	EC6	--	EC6	1.10	0.20	5.52	0.00	0.71	1.50
138	EC7	--	EC7	0.72	0.20	3.69	0.00	0.34	1.10
139	EC8	--	EC8	1.80	0.18	9.90	0.00	1.44	2.15
140	RF10MG	--	RF10MG	0.75	0.12	6.25	0.00	0.51	0.98
141	RF13MA	--	RF13MA	1.17	0.16	7.42	0.00	0.86	1.48
142	RF15MA	--	RF15MA	1.01	0.14	7.45	0.00	0.75	1.28
143	TMS41	--	TMS41	1.12	0.12	9.12	0.00	0.88	1.36
144	RWO51	--	RWO51	1.58	0.17	9.11	0.00	1.24	1.92
145	RWO31	--	RWO31	0.64	0.11	5.88	0.00	0.43	0.86
146	RES51	--	RES51	1.10	0.12	9.50	0.00	0.87	1.32
147	PRE51	--	PRE51	1.29	0.13	9.56	0.00	1.02	1.55
148	FRT111	--	FRT111	1.19	0.12	10.06	0.00	0.96	1.43
149	PIE10R3	--	PIE10R3	1.11	0.12	9.01	0.00	0.87	1.35
150	PIE1R3	--	PIE1R3	1.71	0.18	9.65	0.00	1.36	2.06
151	PIE123	--	PIE123	0.77	0.09	8.50	0.00	0.59	0.95
152	PPG33	--	PPG33	0.68	0.08	9.05	0.00	0.53	0.83
153	PPG93	--	PPG93	0.74	0.08	8.72	0.00	0.57	0.90
154	PPG63	--	PPG63	0.54	0.07	8.32	0.00	0.41	0.67
155	AUT14	--	AUT14	0.68	0.07	10.33	0.00	0.55	0.81
156	CHA104	--	CHA104	0.16	0.05	3.45	0.00	0.07	0.24
157	CHA14	--	CHA14	0.26	0.04	7.14	0.00	0.19	0.33
158	CHA114	--	CHA114	0.34	0.03	9.87	0.00	0.27	0.40
159	CHA8R4	--	CHA8R4	0.95	0.09	10.24	0.00	0.77	1.13
160	AIT44	--	AIT44	0.77	0.08	10.00	0.00	0.62	0.92
161	MIC72	--	MIC72	1.13	0.12	9.19	0.00	0.89	1.37
162	ORI4R2	--	ORI4R2	1.60	0.16	10.08	0.00	1.29	1.91
163	ORI12	--	ORI12	1.18	0.12	9.72	0.00	0.95	1.42
164	MIC8R2	--	MIC8R2	1.09	0.12	8.94	0.00	0.85	1.32
165	ORI22	--	ORI22	1.83	0.18	10.06	0.00	1.47	2.18
166	MIC11R2	--	MIC11R2	1.55	0.16	9.74	0.00	1.24	1.87
167	ATT7	--	ATT7	0.73	0.09	8.37	0.00	0.56	0.90
168	ATT8	--	ATT8	0.71	0.09	7.90	0.00	0.53	0.88
169	ATT9	--	ATT9	0.38	0.05	6.96	0.00	0.27	0.49
170	ATT10	--	ATT10	0.52	0.06	8.95	0.00	0.40	0.63
171	ND1	--	ND1	1.18	0.16	7.44	0.00	0.87	1.49
172	ND2	--	ND2	1.42	0.21	6.68	0.00	1.00	1.83
173	ND3	--	ND3	1.08	0.16	6.90	0.00	0.77	1.39
174	AUTO1	--	AUTO1	1.85	0.19	9.49	0.00	1.47	2.23
175	AUTO2	--	AUTO2	0.62	0.10	6.47	0.00	0.43	0.80
176	AUTO4	--	AUTO4	0.31	0.11	2.83	0.00	0.10	0.53
177	CAPA1	--	CAPA1	1.58	0.17	9.23	0.00	1.24	1.91
178	CAPA2	--	CAPA2	1.37	0.15	9.28	0.00	1.08	1.66
179	CAPA3	--	CAPA3	0.74	0.10	7.07	0.00	0.54	0.95
180	CAPA5	--	CAPA5	0.61	0.11	5.52	0.00	0.39	0.82
181	INT1	--	INT1	0.59	0.09	6.57	0.00	0.41	0.76
182	INT3	--	INT3	0.37	0.06	5.92	0.00	0.25	0.49

183	INT5	--	INT5	0.70	0.08	9.00	0.00	0.55	0.85
184	NBIdee	--	NBIdee	15.52	1.45	10.70	0.00	12.67	18.36
185	SCOCREA	--	SCOCREA	0.51	0.05	10.70	0.00	0.42	0.61
186	PrematEval	--	PrematEval	1.69	0.29	5.74	0.00	1.11	2.27
187	RFM	--	RFM	1.01	0.18	5.74	0.00	0.67	1.36
188	Support	--	Support	0.49	0.13	3.80	0.00	0.24	0.75
189	Interperso	--	Interperso	0.55	0.14	3.98	0.00	0.28	0.83
190	Chall	--	Chall	0.16	0.05	3.06	0.00	0.06	0.26
191	Tot	--	Tot	0.33	0.11	2.97	0.00	0.11	0.56
192	Att	--	Att	0.92	0.15	6.30	0.00	0.63	1.20
193	ND	--	ND	1.01	0.20	5.08	0.00	0.62	1.40
194	Auto	--	Auto	1.45	0.26	5.58	0.00	0.94	1.96
195	Capa	--	Capa	0.85	0.18	4.79	0.00	0.50	1.20
196	INT	--	INT	0.66	0.11	5.89	0.00	0.44	0.88

Notes. lhs= latent variables, rhs= observed variables, op=operator (= ~ signifies measurement model, ~ signifies regressions, ~ ~ signifies residual correlations), est= estimate, se= standard error, ci.lower = lower confidence interval, ci.upper = upper confidence interval.





## Appendix 4.3. Study 5: Factor loadings, AVE, CR and Cronbach's alphas

Construct	Loading	CR	AVE	Alpha
Intentions		.92	.93	.92
En supposant que vous soyez amené(e) à implémenter le télétravail, accepteriez-vous de revoir vos pratiques managériales ?	.94			
Si on vous demandait d'implémenter le télétravail, seriez-vous prêt à adapter vos pratiques managériales pour ce faire ?	.92			
En supposant que vous implémentiez le télétravail, auriez-vous l'intention d'inventer de nouveaux modes de management pour réaliser ce projet ?	.84			
Attitude toward innovative behaviors		.85	.59	.84
Selon vous, changer vos pratiques managériales suite à l'implémentation du télétravail serait Utile - Inutile	.60			
<i>Selon vous, changer vos pratiques managériales suite à l'implémentation du télétravail serait Nocif - Bénéfique</i>				
Selon vous, changer vos pratiques managériales suite à l'implémentation du télétravail serait Inéfficace - Efficace	.85			
<i>Selon vous, changer vos pratiques managériales suite à l'implémentation du télétravail serait Simple - Compliqué</i>				
Selon vous, changer vos pratiques managériales suite à l'implémentation du télétravail serait Raisonnable - Déraisonnable	.87			
Selon vous, changer vos pratiques managériales suite à l'implémentation du télétravail serait Adapté - Inadapté	.75			
Perceived capacity		.79	.66	.75
J'ai suffisamment d'expérience pour adapter mes pratiques managériales afin d'implémenter le télétravail	.62			
Il me sera difficile d'adapter mes pratiques managériales pour implémenter le télétravail	.96			
<i>Autonomie</i>				
<i>Je suis libre de modifier mes pratiques managériales comme je le souhaite pour implémenter le télétravail</i>				
<i>Je pense pouvoir contrôler le fait d'adapter mes pratiques managériales comme je le souhaite pour implémenter le télétravail</i>				
Attitude toward organizational change		.93	.76	.92
Selon vous, implémenter le télétravail serait Utile - Inutile	.83			

Construct	Loading	CR	AVE	Alpha
Selon vous, implémenter le télétravail serait Nocif - Bénéfique	.91			
Selon vous, implémenter le télétravail serait Inéfficace - Efficace	.85			
<i>Selon vous, implémenter le télétravail serait Simple - Complicqué</i>				
Selon vous, implémenter le télétravail serait Raisonnable - Déraisonnable	.90			
<i>Selon vous, implémenter le télétravail serait Adapté - Inadapté</i>				
Attitude toward ideation		.92	.54	.93
Les idées sont essentielles pour prendre des décisions et, en tant que tel, elles ne doivent pas être tenues pour acquises	.76			
Dans les organisations, les dirigeants devraient encourager les idées en démontrant qu'ils sont désireux de les mettre en pratique	.75			
<i>Les nouvelles idées aboutissent à de nouvelles solutions</i>				
Le fait que nous soyons en retard est dû à un manque d'idées nouvelles	.56			
Générer de nouvelles idées développe l'esprit	.80			
D'anciens problèmes peuvent être résolus avec de nouvelles idées	.78			
<i>Trouver une bonne idée justifie amplement le temps perdu à en générer une centaine de mauvaises</i>				
<i>Vous ne devriez pas juger vos nouvelles idées à priori</i>				
Une idée en germe peut évoluer en une grande idée	.82			
<i>La plupart des idées que nous essayons ne sont pas réellement nouvelles</i>				
<i>Les idées nouvelles sont aisément rejetées</i>				
Nous avons besoins de plus de personnes créatives dans les affaires	.76			
Les idées nouvelles génèrent plus de nouvelles idées	.74			
Une idée nouvelle peut sauver une vie	.59			
Nous allons nous laisser distancer à moins d'accorder du temps aux idées nouvelles	.76			
<i>Nous avons vraiment besoin de personnes créatives</i>				
Les industriels devraient être créatifs	.85			
<i>Le management devrait être plus créatif</i>				
Organizational support		.92	.60	.92
Bien que mon organisation soit consciente des risques, elle soutient les projets innovants	.73			
Je réalise souvent de nouveaux projets	.70			
Les dirigeants de l'organisation permettent aux collaborateurs d'exprimer leur potentiel créatif	.80			
Mes responsables m'encouragent à avoir de nouvelles	.65			

Construct	Loading	CR	AVE	Alpha
idées				
Mon organisation me fixe des objectifs qui requièrent de faire preuve d'une certaine créativité	.76			
Mon organisation est prête à expérimenter de nouvelles pratiques	.85			
Mon entreprise encourage la créativité tant que le travail réalisé reste de qualité	.86			
Mon organisation s'engage sur la qualité des idées innovantes	.81			

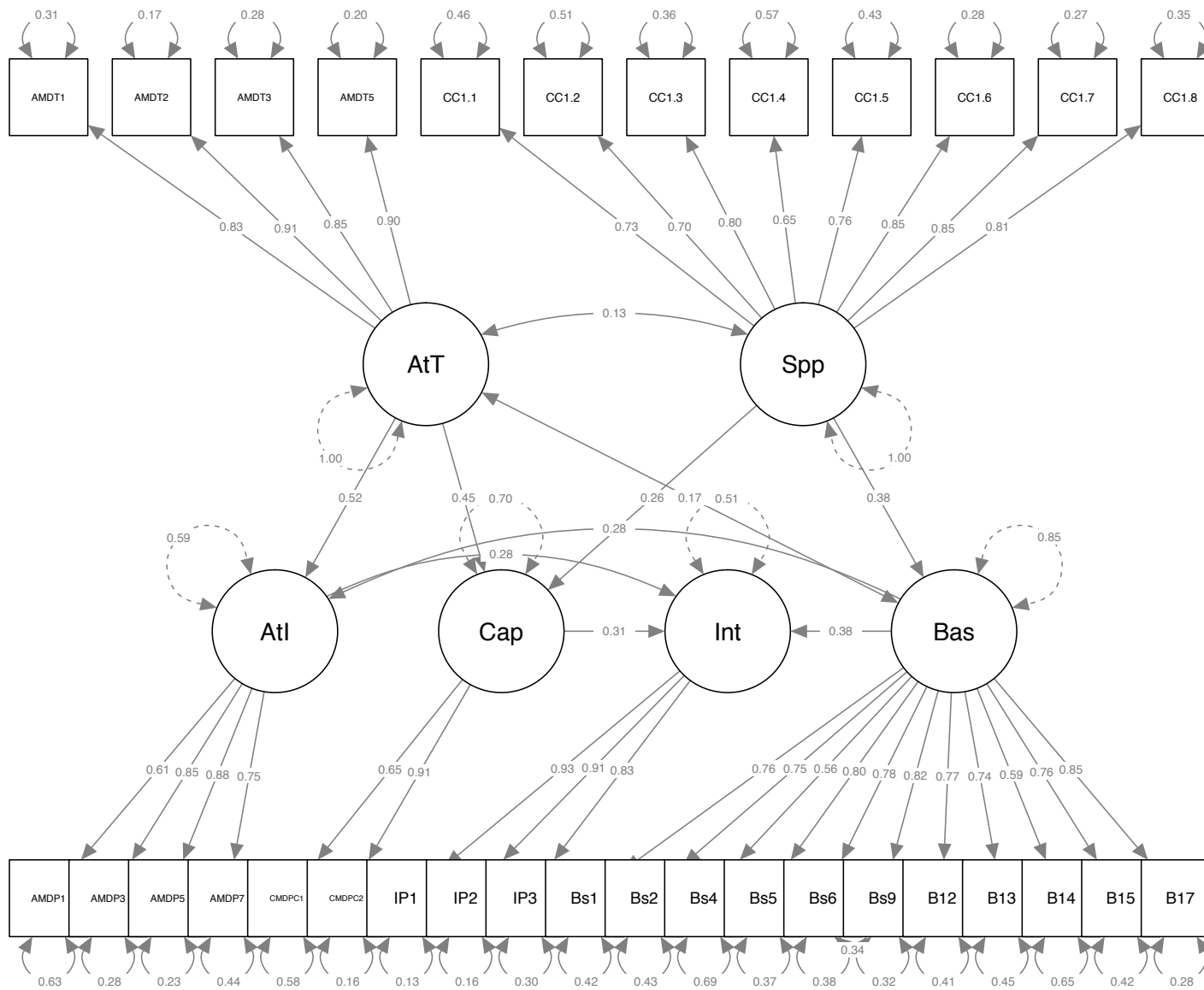
*Note.* M, SD, CR and AVE are used to represent means and standard deviations, composite reliabilities and average variances extracted respectively. Items in italics have been removed before testing the hypotheses.

## Appendix 4.4. Study 5: Lavaan output of Structural Equation Modelling

	lhs	op	rhs	est	se	z	pvalue	ci.lower	ci.upper
1	AttT	=	AMDT1	1.58	0.14	11.62	0.00	1.31	1.83
2	AttT	=	AMDT2	1.44	0.12	11.79	0.00	1.18	1.66
3	AttT	=	AMDT3	1.39	0.12	11.13	0.00	1.11	1.63
4	AttT	=	AMDT5	1.56	0.12	12.80	0.00	1.30	1.79
5	AttI	=	AMDP1	0.81	0.18	4.50	0.00	0.45	1.15
6	AttI	=	AMDP3	0.97	0.12	7.77	0.00	0.70	1.19
7	AttI	=	AMDP5	1.06	0.15	6.81	0.00	0.74	1.34
8	AttI	=	AMDP7	0.85	0.16	5.32	0.00	0.53	1.15
9	Capa	=	CMDPCap1	0.92	0.18	5.10	0.00	0.56	1.26
10	Capa	=	CMDPCap2	1.36	2.38	0.57	0.57	0.96	2.00
11	Int	=	IntP1	0.93	0.12	7.47	0.00	0.62	1.10
12	Int	=	IntP2	0.92	0.12	7.35	0.00	0.62	1.11
13	Int	=	IntP3	0.89	0.12	7.23	0.00	0.59	1.06
14	Bas	=	Bas1	0.79	0.09	9.29	0.00	0.62	0.95
15	Bas	=	Bas2	0.83	0.09	9.13	0.00	0.64	1.00
16	Bas	=	Bas4	0.81	0.15	5.43	0.00	0.50	1.07
17	Bas	=	Bas5	0.87	0.11	8.24	0.00	0.65	1.06
18	Bas	=	Bas6	0.85	0.11	8.04	0.00	0.63	1.04
19	Bas	=	Bas9	0.98	0.11	9.32	0.00	0.74	1.17
20	Bas	=	Bas12	1.01	0.11	9.36	0.00	0.77	1.20
21	Bas	=	Bas13	0.96	0.12	8.25	0.00	0.71	1.17
22	Bas	=	Bas14	0.89	0.16	5.74	0.00	0.55	1.17
23	Bas	=	Bas15	1.04	0.12	8.81	0.00	0.80	1.25
24	Bas	=	Bas17	1.08	0.10	10.36	0.00	0.86	1.27
25	Supp	=	CC1.1	1.03	0.13	7.89	0.00	0.75	1.28
26	Supp	=	CC1.2	0.93	0.13	7.31	0.00	0.68	1.19
27	Supp	=	CC1.3	1.22	0.13	9.45	0.00	0.95	1.46
28	Supp	=	CC1.4	0.98	0.16	6.06	0.00	0.66	1.31
29	Supp	=	CC1.5	1.14	0.12	9.53	0.00	0.90	1.37
30	Supp	=	CC1.6	1.30	0.13	10.06	0.00	1.03	1.53
31	Supp	=	CC1.7	1.40	0.13	10.68	0.00	1.14	1.64
32	Supp	=	CC1.8	1.08	0.12	9.01	0.00	0.84	1.31
33	Bas6	--	Bas9	0.18	0.09	2.06	0.04	0.00	0.35
34	Int	-	AttI	0.30	0.17	1.76	0.08	0.01	0.69
35	Int	-	Capa	0.36	0.17	2.12	0.03	0.03	0.71
36	Int	-	Bas	0.49	0.20	2.42	0.02	0.16	0.99
37	AttI	-	AttT	0.68	0.20	3.48	0.00	0.32	1.10
38	AttI	-	Bas	0.34	0.16	2.15	0.03	0.06	0.69
39	Capa	-	AttT	0.53	0.18	2.89	0.00	0.22	0.93
40	Capa	-	Supp	0.31	0.15	2.05	0.04	0.04	0.64
41	Bas	-	Supp	0.42	0.17	2.43	0.01	0.11	0.81
42	AttT	--	Bas	0.17	0.11	1.51	0.13	-0.06	0.39
43	AttT	--	Supp	0.13	0.12	1.09	0.28	-0.10	0.35
44	AMDT1	--	AMDT1	1.10	0.25	4.38	0.00	0.58	1.59

45	AMDT2	--	AMDT2	0.43	0.13	3.18	0.00	0.17	0.71
46	AMDT3	--	AMDT3	0.76	0.16	4.80	0.00	0.47	1.10
47	AMDT5	--	AMDT5	0.60	0.20	2.99	0.00	0.25	1.03
48	AMDP1	--	AMDP1	1.89	0.50	3.79	0.00	0.90	2.80
49	AMDP3	--	AMDP3	0.63	0.18	3.55	0.00	0.26	0.96
50	AMDP5	--	AMDP5	0.58	0.21	2.69	0.01	0.17	1.01
51	AMDP7	--	AMDP7	0.97	0.23	4.28	0.00	0.54	1.43
52	CMDPCap1	--	CMDPCap1	1.65	0.41	4.06	0.00	0.72	2.31
53	CMDPCap2	--	CMDPCap2	0.52	142.01	0.00	1.00	-1.65	1.40
54	IntP1	--	IntP1	0.25	0.09	2.72	0.01	0.08	0.45
55	IntP2	--	IntP2	0.33	0.17	1.90	0.06	0.07	0.73
56	IntP3	--	IntP3	0.68	0.27	2.57	0.01	0.29	1.31
57	Bas1	--	Bas1	0.54	0.08	6.52	0.00	0.36	0.69
58	Bas2	--	Bas2	0.62	0.15	4.26	0.00	0.35	0.94
59	Bas4	--	Bas4	1.72	0.26	6.59	0.00	1.18	2.20
60	Bas5	--	Bas5	0.51	0.11	4.51	0.00	0.29	0.75
61	Bas6	--	Bas6	0.53	0.11	4.78	0.00	0.31	0.73
62	Bas9	--	Bas9	0.54	0.11	4.91	0.00	0.31	0.74
63	Bas12	--	Bas12	0.82	0.15	5.55	0.00	0.53	1.13
64	Bas13	--	Bas13	0.89	0.21	4.24	0.00	0.49	1.32
65	Bas14	--	Bas14	1.76	0.35	5.00	0.00	1.09	2.44
66	Bas15	--	Bas15	0.93	0.18	5.20	0.00	0.58	1.29
67	Bas17	--	Bas17	0.52	0.11	4.70	0.00	0.29	0.73
68	CC1.1	--	CC1.1	0.91	0.18	4.96	0.00	0.56	1.29
69	CC1.2	--	CC1.2	0.90	0.15	5.97	0.00	0.61	1.18
70	CC1.3	--	CC1.3	0.83	0.15	5.41	0.00	0.53	1.14
71	CC1.4	--	CC1.4	1.29	0.25	5.25	0.00	0.76	1.73
72	CC1.5	--	CC1.5	0.97	0.20	4.89	0.00	0.57	1.36
73	CC1.6	--	CC1.6	0.66	0.13	5.27	0.00	0.41	0.90
74	CC1.7	--	CC1.7	0.73	0.18	4.03	0.00	0.38	1.07
75	CC1.8	--	CC1.8	0.62	0.12	5.24	0.00	0.37	0.83
76	AttT	--	AttT	1.00	0.00			1.00	1.00
77	AttI	--	AttI	1.00	0.00			1.00	1.00
78	Capa	--	Capa	1.00	0.00			1.00	1.00
79	Int	--	Int	1.00	0.00			1.00	1.00
80	Bas	--	Bas	1.00	0.00			1.00	1.00
81	Supp	--	Supp	1.00	0.00			1.00	1.00

Notes. lhs= latent variables, rhs= observed variables, op=operator (=~ signifies measurement model, ~ signifies regressions, ~~ signifies residual correlations), est= estimate, se= standard error, ci.lower = lower confidence interval, ci.upper = upper confidence interval.



# Appendix 5. Chapter 6: Fit or misfit?

## Appendix 5.1. Study 6: Factor loadings, AVE, CR and Cronbach's alphas

Construct	Loading	CR	AVE	Alpha
Innovative work behaviors		.92	.50	.94
Dans quelle mesure...				
réfléchissez-vous activement aux façons d'améliorer le travail de vos proches collègues ?	.66			
produisez-vous des idées pour améliorer ou renouveler les services assurés par votre département ?	.72			
produisez-vous des idées pour optimiser l'utilisation des connaissances et des compétences au sein de votre département ?	.77			
produisez-vous de nouvelles solutions pour résoudre d'anciens problèmes ?	.72			
discutez-vous avec vos collègues afin d'identifier vos/leurs difficultés au travail ?	.73			
suggeriez-vous de nouvelles façons de communiquer au sein de votre département ?	.46			
proposez-vous des idées concernant la répartition des missions et des activités au sein de votre département ?	.70			
vous impliquez-vous activement dans la réflexion sur les connaissances et compétences requises au sein de votre département ?	.72			
essayez-vous d'identifier ce qui entrave la collaboration et coordination ?	.67			
vous engagez-vous activement à collecter des informations pour identifier les écarts de votre département ?	.71			
êtes vous amené à collaborer avec vos collègues pour transformer de nouvelles idées afin qu'elles puissent s'appliquer concrètement ?	.75			
cherchez-vous avec une grande persévérance à concrétiser les idées au sein de votre département/organisation ?	.79			

Construct	Loading	CR	AVE	Alpha
êtes vous amené à transformer de nouvelles idées pour qu'elles puissent s'appliquer concrètement ?	.78			
mobilisez-vous le soutien de vos collègues autour de vos idées et solutions ?	.70			
eliminez-vous les obstacles dans le processus d'implémentation de l'idée ?	.70			
faites-vous en sorte que votre supérieur soit enthousiaste à propos de vos idées ?	.59			
Job Satisfaction		.82	.54	.82
J'éprouve beaucoup de plaisir sur mon poste de travail	.87			
<i>Je m'ennuie assez souvent sur mon poste de travail</i>				
En toute connaissance de cause et si c'était à refaire, j'accepterais de nouveau ce poste sans hésiter	.68			
<i>J'envisage de changer de type de poste</i>				
J'aime mon travail plus que la plupart des personnes	.55			
<i>Mon travail ne répond pas aux attentes que j'avais lorsque j'ai accepté le poste</i>				
La plupart du temps, je suis enthousiaste à propos de mon travail	.89			
<i>Je suis assez peu satisfait de mon poste de travail</i>				
Affective commitment		.80	.50	.80
Je serais très heureux de passer le reste de ma carrière dans mon entreprise	.62			
<i>Je n'ai pas le sentiment de "faire partie de la famille" dans mon entreprise</i>				
J'aime discuter de mon entreprise avec des personnes extérieures	.67			
<i>Je pense que je pourrais facilement m'attacher à une autre entreprise autant qu'à celle-ci</i>				
Je suis touché(e) par les problèmes de mon entreprise comme s'il s'agissait des miens	.66			
<i>Je ne me sens pas "émotionnellement attaché(e)" à mon entreprise</i>				
Mon entreprise est une grande source de satisfaction personnelle pour moi	.89			
<i>Je ne ressens pas un fort sentiment d'appartenance à l'égard de mon entreprise</i>				
Creative role identity		.75	.51	.75
<i>La créativité est un sujet qui me concerne plus que les autres managers</i>				
Je ne porte pas beaucoup d'intérêt à la créativité en entreprise	.70			



Construct	Loading	CR	AVE	Alpha
<i>Je pense que la créativité au travail permet de trouver des solutions à des problèmes complexes</i>				
<i>Je ne pense pas que la créativité favorise le changement en entreprise</i>				
Etre créatif dans mon travail est une part importante de moi-même	.80			
<i>Je pense qu'il n'est pas nécessaire d'être créatif pour être un bon manager</i>				
<i>Je pense que la créativité est importante pour l'entreprise</i>				
Je n'ai pas d'idée précise de ce que représente la créativité au travail	.66			
Organizational expectations toward creativity		.88	.71	.88
On attend de moi que je produise un travail créatif	.92			
La créativité est exigée dans mon travail quotidien	.86			
On m'encourage à résoudre des problèmes de façon créative	.73			
Creative self-efficacy				
<i>J'ai confiance en ma capacité à résoudre des problèmes de façon créative</i>				
<i>Je pense être peu doué(e) pour générer de nouvelles idées</i>				
<i>J'ai un certain talent pour approfondir les idées des autres</i>				
<i>J'ai des difficultés à redéfinir des problèmes complexes</i>				
<i>Lorsque j'ai une idée nouvelle, je ne sais pas comment m'y prendre pour la mettre en œuvre</i>				
<i>J'ai confiance en mes capacités à mobiliser mes collègues pour mettre en œuvre mes/leurs idées</i>				

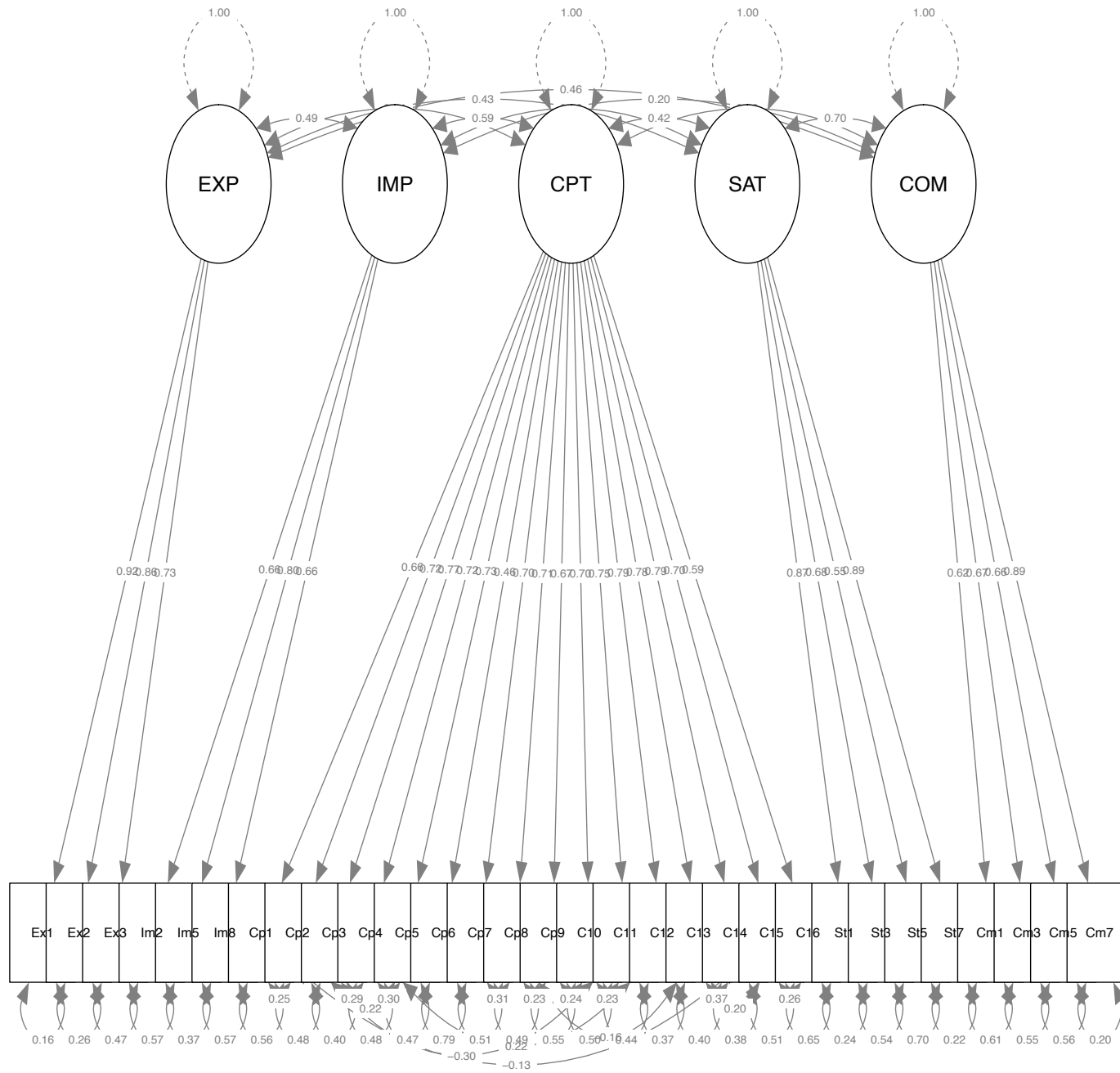
Note. M, SD, CR and AVE are used to represent means and standard deviations, composite reliabilities and average variances extracted respectively. Items in italics have been removed before testing the hypotheses.

## Appendix 5.2. Study 6: Lavaan output of the confirmatory factorial analysis

	lhs	op	rhs	est	se	z	pvalue	ci.lower	ci.upper
1	EXP	=	Exp1	1.45	0.09	15.30	0.00	1.27	1.64
2	EXP	=	Exp2	1.32	0.10	13.82	0.00	1.13	1.51
3	EXP	=	Exp3	1.07	0.10	11.04	0.00	0.88	1.26
4	IMP	=	Imp2	0.82	0.09	8.83	0.00	0.63	1.00
5	IMP	=	Imp5	1.11	0.10	10.98	0.00	0.91	1.31
6	IMP	=	Imp8	0.80	0.09	8.80	0.00	0.62	0.98
7	CPT	=	Cpt1	0.87	0.09	9.74	0.00	0.70	1.05
8	CPT	=	Cpt2	0.88	0.08	10.95	0.00	0.72	1.04
9	CPT	=	Cpt3	0.95	0.08	12.10	0.00	0.80	1.11
10	CPT	=	Cpt4	0.99	0.09	10.99	0.00	0.82	1.17
11	CPT	=	Cpt5	0.96	0.09	11.18	0.00	0.79	1.12
12	CPT	=	Cpt6	0.59	0.09	6.30	0.00	0.40	0.77
13	CPT	=	Cpt7	0.92	0.09	10.49	0.00	0.74	1.09
14	CPT	=	Cpt8	1.06	0.10	10.84	0.00	0.87	1.25
15	CPT	=	Cpt9	0.94	0.09	9.97	0.00	0.75	1.12
16	CPT	=	Cpt10	0.90	0.08	10.62	0.00	0.74	1.07
17	CPT	=	Cpt11	1.14	0.10	11.51	0.00	0.94	1.33
18	CPT	=	Cpt12	1.04	0.08	12.60	0.00	0.88	1.20
19	CPT	=	Cpt13	1.07	0.09	12.19	0.00	0.90	1.24
20	CPT	=	Cpt14	0.99	0.08	12.45	0.00	0.83	1.14
21	CPT	=	Cpt15	0.87	0.08	10.48	0.00	0.71	1.04
22	CPT	=	Cpt16	0.77	0.09	8.51	0.00	0.59	0.95
23	SAT	=	Sat1	1.04	0.07	14.18	0.00	0.89	1.18
24	SAT	=	Sat3	1.01	0.10	9.99	0.00	0.81	1.20
25	SAT	=	Sat5	0.78	0.10	7.65	0.00	0.58	0.98
26	SAT	=	Sat7	1.02	0.07	14.51	0.00	0.88	1.15
27	COM	=	Com1	1.04	0.12	8.76	0.00	0.81	1.28
28	COM	=	Com3	1.06	0.11	9.67	0.00	0.84	1.27
29	COM	=	Com5	1.06	0.11	9.47	0.00	0.84	1.28
30	COM	=	Com7	1.30	0.09	14.18	0.00	1.12	1.48
31	Cpt13	--	Cpt14	0.25	0.06	4.13	0.00	0.13	0.36
32	Cpt7	--	Cpt8	0.30	0.08	3.76	0.00	0.14	0.46
33	Cpt8	--	Cpt9	0.25	0.08	3.12	0.00	0.09	0.40
34	Cpt9	--	Cpt10	0.23	0.07	3.24	0.00	0.09	0.37
35	Cpt3	--	Cpt4	0.21	0.06	3.44	0.00	0.09	0.34
36	Cpt4	--	Cpt5	0.25	0.07	3.57	0.00	0.11	0.39
37	Cpt13	--	Cpt15	0.16	0.06	2.83	0.00	0.05	0.27
38	Cpt8	--	Cpt13	-0.14	0.06	-2.47	0.01	-0.26	-0.03
39	Cpt4	--	Cpt12	0.16	0.06	2.78	0.01	0.05	0.28
40	Cpt3	--	Cpt5	0.15	0.06	2.57	0.01	0.04	0.27
41	Cpt1	--	Cpt15	-0.12	0.06	-1.85	0.06	-0.24	0.01
42	Cpt15	--	Cpt16	0.24	0.07	3.26	0.00	0.10	0.39
43	Cpt2	--	Cpt11	-0.26	0.07	-3.89	0.00	-0.38	-0.13
44	Cpt1	--	Cpt2	0.21	0.07	2.99	0.00	0.07	0.34

45	Cpt10	--	Cpt11	0.21	0.07	2.85	0.00	0.07	0.36
46	Exp1	--	Exp1	0.39	0.10	3.81	0.00	0.19	0.59
47	Exp2	--	Exp2	0.62	0.10	6.05	0.00	0.42	0.82
48	Exp3	--	Exp3	1.00	0.12	8.32	0.00	0.77	1.24
49	Imp2	--	Imp2	0.87	0.12	7.50	0.00	0.64	1.09
50	Imp5	--	Imp5	0.71	0.14	5.07	0.00	0.44	0.99
51	Imp8	--	Imp8	0.85	0.11	7.52	0.00	0.63	1.07
52	Cpt1	--	Cpt1	0.98	0.11	8.92	0.00	0.77	1.20
53	Cpt2	--	Cpt2	0.71	0.08	8.69	0.00	0.55	0.87
54	Cpt3	--	Cpt3	0.61	0.07	8.47	0.00	0.47	0.76
55	Cpt4	--	Cpt4	0.90	0.10	8.77	0.00	0.70	1.10
56	Cpt5	--	Cpt5	0.79	0.09	8.68	0.00	0.62	0.97
57	Cpt6	--	Cpt6	1.30	0.14	9.34	0.00	1.03	1.58
58	Cpt7	--	Cpt7	0.89	0.10	8.86	0.00	0.69	1.08
59	Cpt8	--	Cpt8	1.07	0.12	8.86	0.00	0.84	1.31
60	Cpt9	--	Cpt9	1.07	0.12	9.00	0.00	0.84	1.31
61	Cpt10	--	Cpt10	0.83	0.09	8.84	0.00	0.64	1.01
62	Cpt11	--	Cpt11	1.02	0.12	8.58	0.00	0.79	1.26
63	Cpt12	--	Cpt12	0.63	0.08	8.37	0.00	0.49	0.78
64	Cpt13	--	Cpt13	0.75	0.09	8.51	0.00	0.58	0.92
65	Cpt14	--	Cpt14	0.60	0.07	8.37	0.00	0.46	0.74
66	Cpt15	--	Cpt15	0.81	0.09	8.90	0.00	0.63	0.99
67	Cpt16	--	Cpt16	1.10	0.12	9.14	0.00	0.87	1.34
68	Sat1	--	Sat1	0.34	0.06	5.74	0.00	0.22	0.45
69	Sat3	--	Sat3	1.18	0.14	8.58	0.00	0.91	1.44
70	Sat5	--	Sat5	1.40	0.15	9.05	0.00	1.10	1.70
71	Sat7	--	Sat7	0.28	0.05	5.29	0.00	0.18	0.39
72	Com1	--	Com1	1.72	0.20	8.61	0.00	1.33	2.11
73	Com3	--	Com3	1.35	0.16	8.30	0.00	1.03	1.67
74	Com5	--	Com5	1.44	0.17	8.38	0.00	1.10	1.78
75	Com7	--	Com7	0.43	0.11	4.08	0.00	0.22	0.64
76	EXP	--	EXP	1.00	0.00			1.00	1.00
77	IMP	--	IMP	1.00	0.00			1.00	1.00
78	CPT	--	CPT	1.00	0.00			1.00	1.00
79	SAT	--	SAT	1.00	0.00			1.00	1.00
80	COM	--	COM	1.00	0.00			1.00	1.00
81	EXP	--	IMP	0.49	0.07	6.81	0.00	0.35	0.63
82	EXP	--	CPT	0.54	0.06	9.04	0.00	0.42	0.66
83	EXP	--	SAT	0.43	0.07	6.16	0.00	0.29	0.56
84	EXP	--	COM	0.46	0.07	6.57	0.00	0.32	0.59
85	IMP	--	CPT	0.59	0.06	9.38	0.00	0.47	0.72
86	IMP	--	SAT	0.36	0.08	4.48	0.00	0.20	0.52
87	IMP	--	COM	0.20	0.09	2.31	0.02	0.03	0.38
88	CPT	--	SAT	0.42	0.07	6.18	0.00	0.29	0.56
89	CPT	--	COM	0.38	0.07	5.26	0.00	0.24	0.52
90	SAT	--	COM	0.70	0.05	14.15	0.00	0.61	0.80

Notes. lhs= latent variables, rhs= observed variables, op=operator (= ~ signifies measurement model, ~ signifies regressions, ~ signifies residual correlations), est= estimate, se= standard error, ci.lower = lower confidence interval, ci.upper = upper confidence interval.



## Appendix 5.3. Study 6: Polynomial regressions and response surface analyses predicting job satisfaction and affective commitment

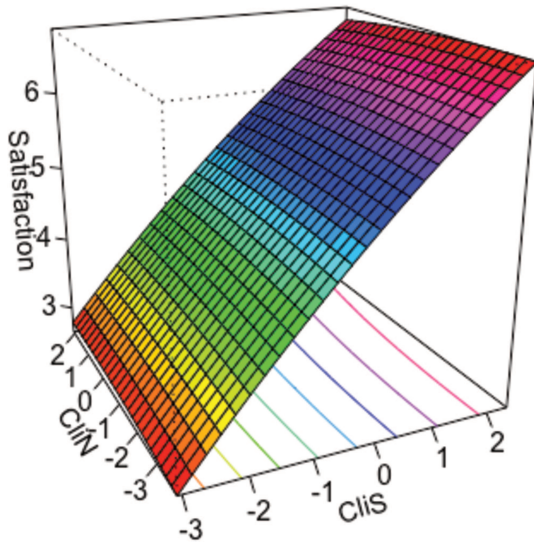
Variables	Job satisfaction			Affective commitment		
	B	SE B	$\beta$	B	SE B	$\beta$
S. Climate	.71	.06	.67***	.72	.10	.57***
N. Climate	-.02	.07	-.02	.17	.08	.14†
S. Climate <sup>2</sup>	-.03	.06	-.04	.20	.08	.23*
S*N. Climate	-.01	.05	-.01	-.04	.07	-.05
N. Climate <sup>2</sup>	-.01	.04	-.01	-.05	.05	-.08
a1 (b1 + b2)	.69	.08	***	.89	.10	***
a2 (b3+b4+b5)	-.05	.05		.12	.05	*
a3 (b1-b2)	.73	.10	***	.55	.15	***
a4 (b3-b4+b5)	-.03	.09		.19	.14	
R <sup>2</sup>		.47***			.34***	
S. Support	.01	.08	.01	.27	.09	.21**
N. Support	.08	.09	.07	.05	.09	.04
S. Support <sup>2</sup>	-.03	.07	-.03	-.11	.06	-.11
S*N. Support	.05	.07	.05	-.12	.08	-.09
N. Support <sup>2</sup>	-.10	.07	-.12	-.30	.07	-.29***
a1 (b1 + b2)	.09	.14		.32	.14	*
a2 (b3+b4+b5)	-.08	.12		-.52	.13	***
a3 (b1-b2)	-.07	.11		.21	.12	†
a4 (b3-b4+b5)	-.17	.11		-.28	.11	*
R <sup>2</sup>		.03			.12***	
S. Challenge	.58	.10	.46***	.43	.10	.29***
N. Challenge	.11	.08	.09	.14	.11	.09
S. Challenge <sup>2</sup>	-.18	.09	-.22*	-.19	.07	-.20**
S*N. Challenge	.03	.10	.02	.20	.10	.14*
N. Challenge <sup>2</sup>	-.01	.05	-.01	-.03	.04	-.04
a1 (b1 + b2)	.68	.12	***	.57	.12	***
a2 (b3+b4+b5)	-.16	.13		-.02	.08	
a3 (b1-b2)	.47	.15	**	.30	.17	†
a4 (b3-b4+b5)	-.22	.14		-.42	.15	**
R <sup>2</sup>		.30***			.14***	

Note. S = Supplies, N = Needs, S\*N = Interaction between supplies and needs, SE = Standard Error;

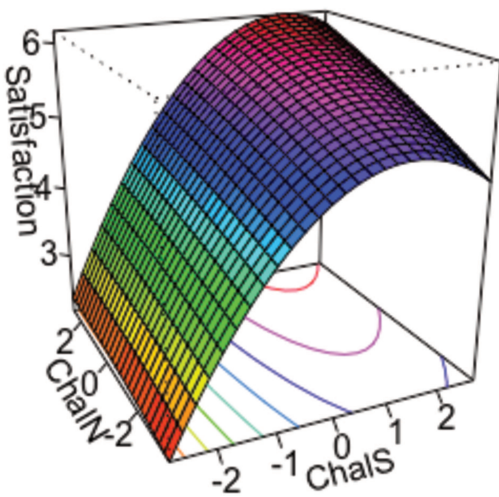
\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

## Response surface analyses predicting job satisfaction

Estimated surface related SN fit of organizational climate on job satisfaction



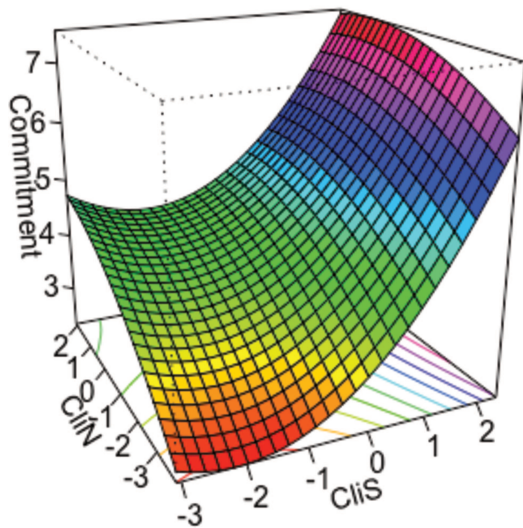
Estimated surface related SN fit of challenge on job satisfaction



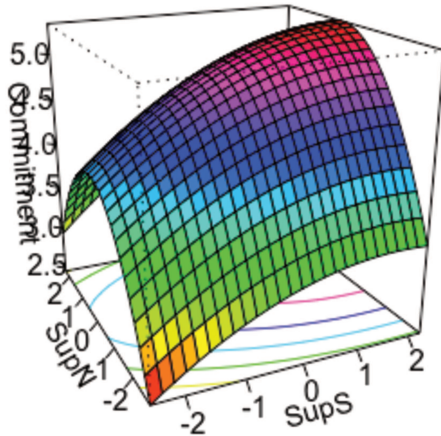


## Response surface analyses predicting affective commitment

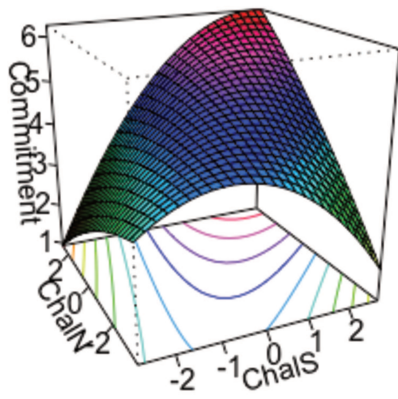
Estimated surface related SN fit of organizational climate on affective commitment



Estimated surface related SN fit of organizational support on affective commitment



Estimated surface related SN fit of challenge on affective commitment





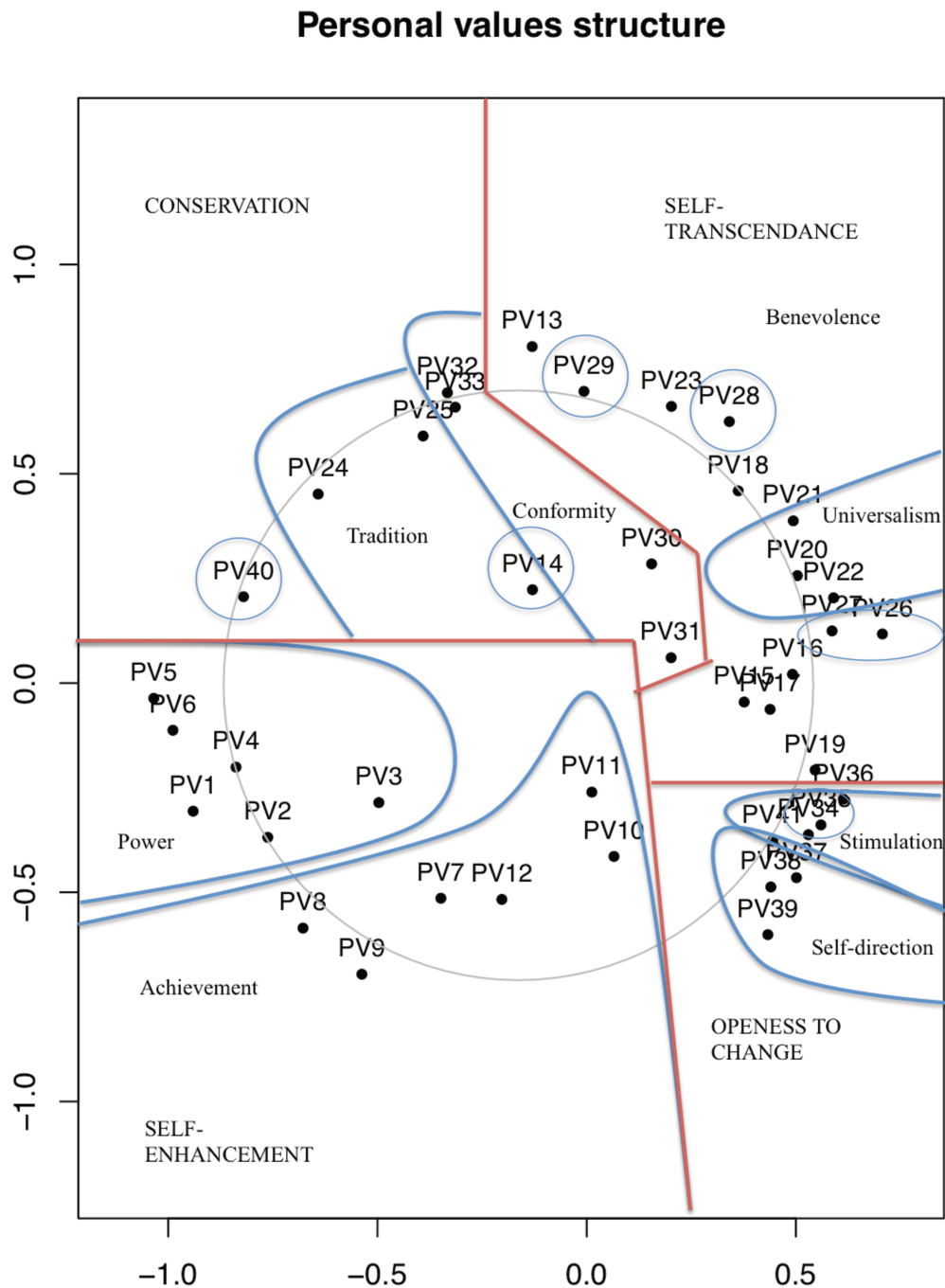
## Appendix 5.4. Study 6: Results of multiple regression analyses testing moderating effects of creative role identity and organizational expectations

Variables	Affective commitment			Innovative behaviors		
	B	SE B	$\beta$	B	SE B	$\beta$
Fit Climate				.70	.15	.32***
CRI				.29	.06	.30***
OE				.20	.07	.21**
Fit.Cl*CRI				-.16	.11	-.10
Fit.Cl*OE				-.02	.14	-.01
Affective Commitment					.41***	
R <sup>2</sup>						
Fit Support	.63	.20	.29**	.76	.27	.27**
CRI	-.07	.12	-.06	.33	.34	.34***
OE	.46	.20	.36***	.16	.17	.17*
Fit.S*CRI	-.24	.20	-.13	-.12	.24	-.04
Fit.S*OE	.24	.15	.20	.03	.17	.02
Affective Commitment				.11	.14	.14*
R <sup>2</sup>		.18***			.39***	
Fit Challenge	1.04	.19	.39***	.53	.33	.15
CRI	-.13	.09	-.11	.31	.07	.32***
OE	.49	.09	.39***	.21	.07	.22**
Fit.Ch*CRI	.07	.18	.03	.18	.21	.11
Fit.Ch*OE	-.10	.23	-.03	-.48	.32	-.17
Affective Commitment		.26***		.16	.05	.16***
R <sup>2</sup>					.37***	

Notes. CRI = Creative role identity, OE = Organizational expectations, Fit.Cl = Fit climate, Fit.S = Fit Support, Fit.Ch = Fit challenge. Fit variables are assessed by their respective block variables. SE = Standard Error. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

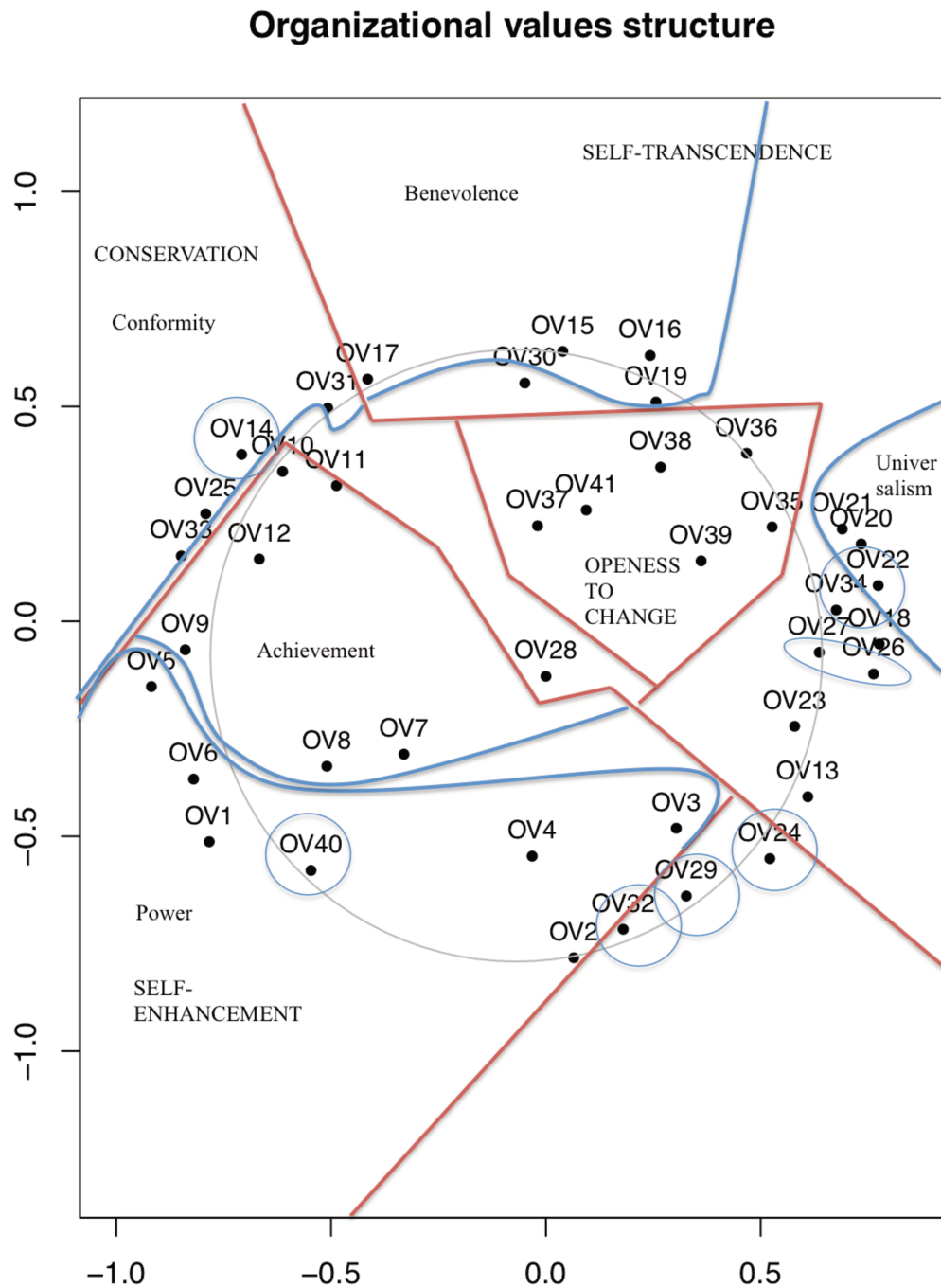
## Appendix 5.5. Study 7: Multidimensional scalings ( $N = 41$ values)

### Multidimensional scaling 1 for Personal values



*Note.* Values that are circled are not located in their theoretical category and were subsequently removed.

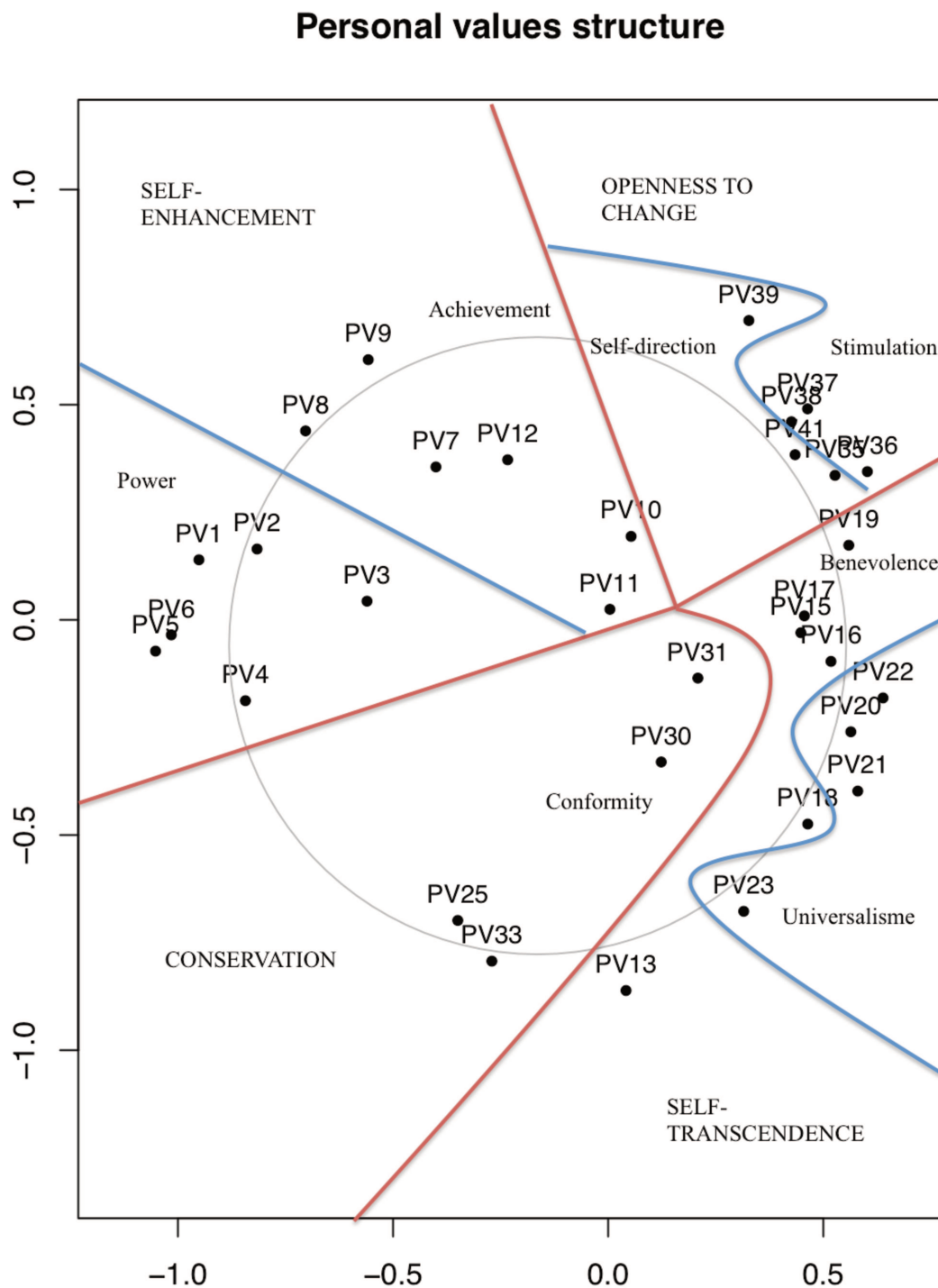
# Multidimensional scaling 1 for Organizational values



*Note.* Values that are circled are not located in their theoretical category and were subsequently removed.

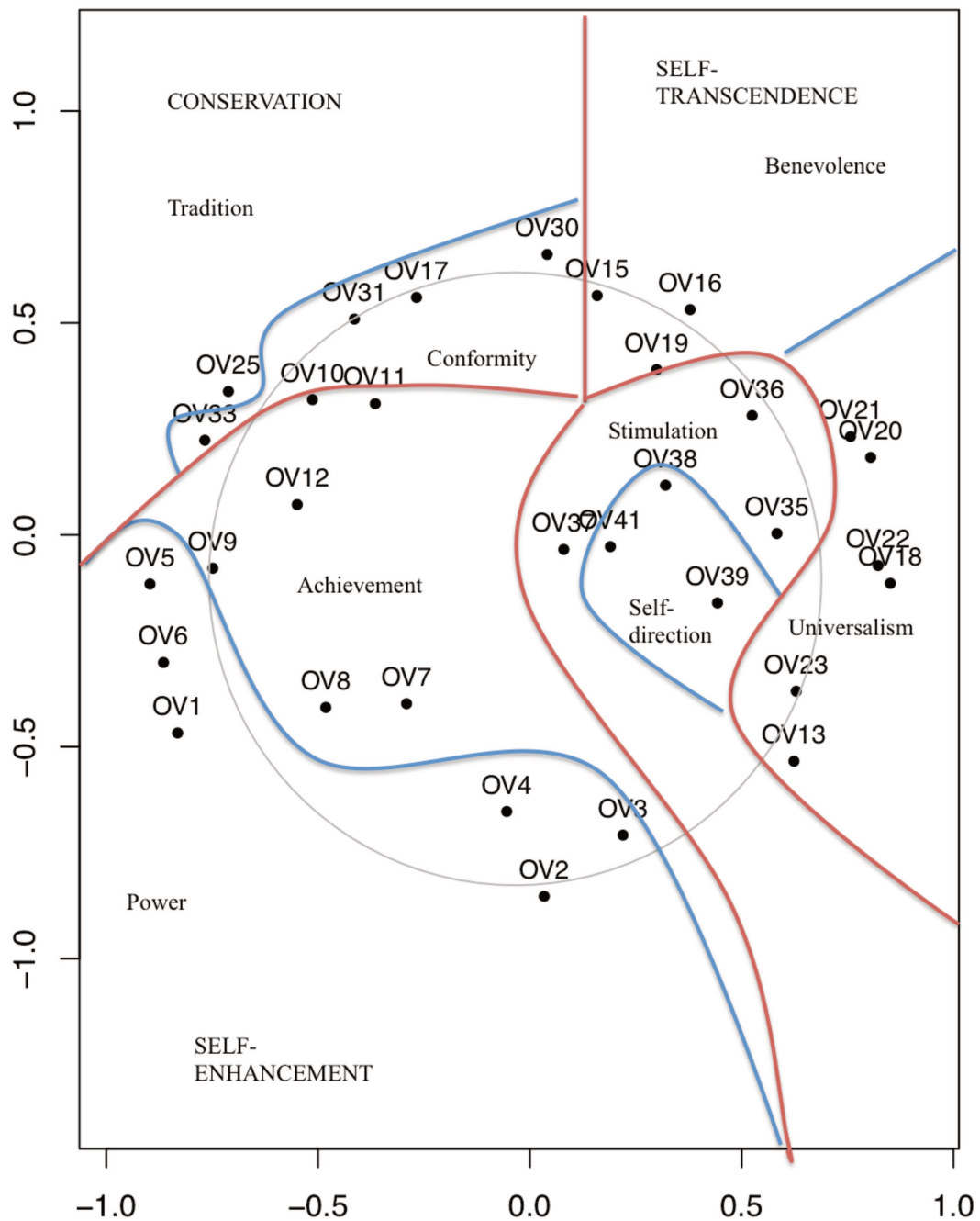
## Appendix 5.6. Study 7: Multidimensional scalings ( $N = 32$ values)

### Multidimensional scaling 2 for Personal values



# Multidimensional scaling 2 for Organizational values

Organizational values structure



## Appendix 5.7. Study 7: Factor loadings, AVE, CR and Cronbach's alphas

Construct	Loading	CR	AVE	Alpha
Dissatisfaction toward prescribed practices		.94	.62	.94
Je suis satisfait...				
...des pratiques managériales prescrites par ma hiérarchie.	.85			
...de la façon dont ma hiérarchie me demande de soutenir mes collaborateurs.	.74			
...des conditions imposées par ma hiérarchie quant à la manière de superviser les membres de mon équipe.	.80			
...de la manière dont ma hiérarchie souhaite que je dirige le travail de mon équipe.	.81			
...des procédures de management établies par ma hiérarchie pour reconnaître le travail de mon équipe.	.68			
...des techniques de management conseillées par ma hiérarchie pour amener mon équipe à atteindre ses objectifs.	.83			
...des conduites que ma hiérarchie me demande d'adopter dans la gestion de mon équipe.	.84			
...des actions managériales exigées par ma hiérarchie quant à la planification des tâches de mon équipe.	.77			
...de la façon dont ma hiérarchie recommande d'organiser le travail de mes collaborateurs.	.78			
Compliance with prescribed practices		.91	.72	.91
J'agis en accord avec les techniques de management prescrites par ma hiérarchie.	.86			
Je respecte les pratiques managériales prônées par ma hiérarchie.	.86			
<i>Je soutiens la façon dont ma hiérarchie préconise d'organiser le travail des membres de mon équipe.</i>				
J'adopte les techniques de gestion d'équipe souhaitées par ma hiérarchie.	.84			
Je me conduis de manière à suivre les recommandations de ma hiérarchie quant à la façon de superviser mon équipe.	.82			
Perceived need for change		.87	.77	NA
Les pratiques managériales en vigueur fonctionnent bien et ne possèdent aucun aspect qui devrait être changé.	.93			
Rien n'aurait besoin d'être réellement changé dans la manière dont les managers de mon entreprise travaillent pour être plus efficaces.	.82			
Readiness to act for change		.77	.53	.76
Je pense que je pourrais vouloir aider à changer certaines choses au sujet des pratiques managériales à l'œuvre dans mon entreprise.	.73			

Construct	Loading	CR	AVE	Alpha
Je prévois de participer au(x) potentiels changement(s) pouvant modifier les pratiques managériales de mon entreprise.	.80			
Je travaille dur pour aider à améliorer les pratiques managériales présentes dans mon entreprise.	.64			
Innovative work behaviors		.92	.48	.92
<i>je développe des contacts avec des experts en management en dehors de mon entreprise</i>				
<i>je cherche l'incertitude et des circonstances inhabituelles reliées à mes tâches</i>				
<i>j'accorde de l'attention aux problèmes ne faisant pas partie de mon travail quotidien</i>				
<i>je recherche les opportunités/occasions d'améliorer les pratiques managériales de mon entreprise</i>				
<i>je discute avec mes collègues de sujets concernant mon/leur activité managériale</i>				
<i>je trouve de nouvelles approches pour réaliser mon activité managériale/mes tâches</i>				
je produis des idées pour améliorer les pratiques managériales à l'œuvre dans mon entreprise	.65			
<i>j'investis du temps et de l'énergie pour trouver de meilleures variantes des pratiques managériales présentes dans mon entreprise</i>				
je génère des idées nouvelles reliées aux pratiques managériales mais également réalisables	.59			
<i>je génère des idées révolutionnaires quant aux pratiques de gestion d'équipe à l'œuvre dans mon entreprise</i>				
<i>j'évalue les forces et les faiblesses des nouvelles idées en rapport avec les techniques de management de mon entreprise</i>				
j'évalue l'utilité d'idées innovantes relatives aux pratiques managériales	.72			
<i>j'apporte un regard critique à l'égard d'une nouvelle idée concernant les pratiques managériales de mon entreprise</i>				
<i>je fournis des évaluations des idées proposées en lien avec les pratiques de supervision d'équipe de mon entreprise</i>				
j'expérimente et évalue l'utilité de nouvelles alternatives de management et d'organisation	.63			
j'acquière l'approbation pour les idées innovantes en rapport avec les pratiques managériales de mon entreprise	.73			
je partage et promeus des idées sur la façon d'améliorer les pratiques managériales de mon entreprise auprès de collègues travaillant potentiellement dans des départements différents	.76			
je ne change pas de fusil d'épaule même lorsque mon supérieur hiérarchique ou mes collègues ne sont pas d'accord avec moi	.62			
je mobilise du soutien de la part des collègues pour mes idées en rapport avec les pratiques de gestion d'équipe de mon entreprise	.61			
j'essaie de persuader les autres de l'importance d'une idée nouvelle en lien avec les méthodes de management à l'œuvre dans mon entreprise	.71			

Construct	Loading	CR	AVE	Alpha
<i>je transforme des idées nouvelles en des pratiques managériales</i>				
je contribue à la mise en œuvre d'idées nouvelles en lien avec les techniques de supervision de mon entreprise	.68			
j'implémente l'idée de projet dans mes pratiques managériales	.71			
je cherche à concrétiser avec une grande persévérance les nouvelles idées pour qu'elles puissent s'appliquer dans les pratiques de gestion d'équipe de mon entreprise	.75			
j'essaie d'implémenter de manière active des procédures et des pratiques innovantes qui changeront significativement les techniques de management à l'œuvre dans mon entreprise	.80			

*Note.* M, SD, CR and AVE are used to represent means and standard deviations, composite reliabilities and average variances extracted respectively. Items in italics have been removed before testing the hypotheses.