Development of a multidimensional scale to measure organizational creative capabilities

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Abstract

Although the literature's case and longitudinal studies provide ample evidence of organizational routines that foster creative behaviors, it still lacks an integrative model of organizational creative capabilities (OCCs) and the quantitative evidence to validate such a model. This research is aimed at conceptualizing and developing a reliable and valid scale for OCCs. First, we define the OCC construct's domain by conducting an extensive literature review. We then generate a list of items for the five dimensions of OCCs through a qualitative study involving a group of 24 practitioners (Study 1a) and by surveying nine senior researchers (Study 1b). We refine the OCC scale using a sample of 269 responses collected in France and Canada (Study 2), and we conduct a first-order confirmatory factor analysis (Study 3). Finally, we perform a second-order confirmatory analysis (Study 4a) on samples of 220 responses collected mainly in the USA and Europe, generalize our results to a sample of 205 responses, and strengthen the predictive validity (Study 4b). Our results provide significant evidence that OCCs can be conceptualized around five dimensions: internal socialization routines, idea management routines, external openness routines, creative equipment routines, and internal agility routines. Furthermore, the research confirms the scale's good psychometric qualities, thus ensuring that researchers can be confident in the reliability of any future academic research design using the scale. We also validate the OCC scale's predictive validity by verifying that a five-dimensional reflective scale with 16 indicators has a significant positive effect on the creative outcome. This OCC scale can be used by practitioners to better understand the organizational routines they have to develop in order to strengthen their organization's creativity. It also provides a way for longitudinal studies to observe how OCCs evolve over time.

Keywords: creative capabilities, creative outcome, measurement scale, organizational creativity, validity study

Practitioner Points

- To build organizational creative capabilities managers should develop different sets of routines and devices of idea socialization, idea management, external openness, creative equipment and internal agility
- The dimensions of OCC, idea management and creative equipment routines are particularly important. Managers should start from these dimensions to build organizational creative capabilities
- The OCC scale can serve as a diagnostic tool for managers and organizational leaders enabling them to assess and strengthen the creative capabilities of their organizations.
- An example of a self-assessment tool for organization's creative capacities, based on the OCC scale, is available online at https://www.fabrique-crea.org/occ

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INTRODUCTION

To tackle key problems, needs, and observations, every innovation entails the generation and development of creative ideas. Hence, organizational creativity is the source of the development of new products, services, business models, and methods (Dul & Ceylan, 2014). Moreover, studies across multiple disciplines have shown that managing creativity can lead to major organizational benefits such as resilience, growth, and the capacity to attract and retain employees (Styvén et al., 2022; Zutshi et al., 2021).

However, to develop organizational creativity and make it a genuine organizational capability (Fetrati et al., 2022), simply recruiting creative employees is not enough. In parallel, organizations must be able to provide resources and establish routines that foster creative actions and behaviors (Napier & Nilsson, 2006), i.e., develop organizational creative capabilities (OCCs). Although numerous studies have examined organizational creativity at the individual (Zhou & Shalley, 2003) and group levels (George, 2007), and within the psychological climate and context of creativity (Amabile et al., 1996; Ekvall, 1996), very few have examined the set of organizational routines and devices that affect organizations' creative outcomes (COs). While there is evidence from case studies and longitudinal studies in the literature that organizational routines that foster creative behaviors exist (Cohendet & Simon, 2016; Hargadon & Bechky, 2006), there is no integrative model of organizations' creative capabilities or quantitative evidence to validate such a model.

To address this gap in the literature, we have conceptualized a coherent OCC framework and developed a valid, reliable OCC scale by following the process recommended by Churchill (1979) and Nunnally (1978). We first defined the OCC construct's domain by conducting an extensive review of the literature on organizational creativity to identify key organizational routines. We then generated a list of items corresponding to each of the OCC construct's five dimensions (i.e., internal idea socialization routines, creative equipment routines, idea management routines, external openness routines, and internal agility routines) by conducting: i) an in-depth literature review of prominent journals; ii) a qualitative study involving a group of 24 directors, project managers, and experts from various creative industries (Study 1a); and iii) a study of nine senior researchers in the field of innovation management to assess the suitability of the items selected for the constructs studied (Study 1b). We refined the OCC scale and checked its dimensionality and internal consistency on a sample of 269 responses collected in France and Canada (Study 2). We then conducted a first-order confirmatory factor analysis (CFA), common method bias test, and invariance tests on a sample of 214 responses mostly collected in the United States and Europe (Study 3). We also conducted a second-order CFA and tested the OCC scale's predictive validity on a sample of 220 responses mostly collected in the United States and Europe (Study 4a). Finally, to ensure the generalizability of the scale, we conducted a follow-up study with a sample of 205 responses from industries other than those specifically identified as "creative" (Study 4b).

This research makes three major contributions to the literature on organizational creativity. First, based on a literature review and interviews, it conceptualizes a model of OCCs that integrates the organizational routines that appear to be central to the development of creative behaviors and actions. Second, as past research has not provided a clear measurement tool, this study develops a reliable and valid OCC measurement standard which will help organizational leaders and managers to identify the best routines and factors in which to intervene at the organizational level to achieve COs. Third, the research provides initial evidence of the OCC scale's predictive validity by showing that OCCs have a major influence on CO levels.

THEORETICAL BACKGROUND

From organizational creativity to organizational creative capabilities

The concept of creativity, which originated in psychology, has gradually spread to many other disciplines. Although early studies tended to focus on understanding the factors that might influence creativity at the individual level (Prabhu et al., 2008; Amabile, 1997), in management sciences, research has progressively shifted to the factors that influence creative behaviors and outcomes in organizations (Giustiniano et al., 2016; Chong & Ma, 2010; Woodman et al., 1993). It is from this perspective that a growing number of studies have begun to focus on organizational creativity, which Woodman et al. (1993) define as: "the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social system" (p. 293).

Several levels of analysis have been conducted with a view to understanding the factors that influence creativity in an organizational context. At the individual level, characteristics including motivation (Amabile, 1997; Eisenberger & Shanock, 2003), creative self-efficacy (Dampérat et al., 2016; Richter et al., 2012), mood and affect (Adler & Obstfeld, 2007; Amabile et al., 2005), and traits have been studied. At the group level, research has focused on diversity (Bassett-Jones, 2005), trust (Hemlin, 2009), commitment (Dampérat et al., 2019; Ribeiro et al., 2020), and group leadership (Koh et al., 2019; Reiter-Palmon & Illies, 2004). Finally, at the organizational level, the often-used typology proposed by Andriopoulos (2001) has been employed. It lists five major factors that influence creativity in an organizational context: organizational climate (Açikgöz & Günsel, 2016; Ekvall, 1996), organizational culture (Nouri et al., 2015), resources and skills (Rampa & Agogué, 2021), leadership style (Ribeiro et al., 2020), and systems and structures (Fortwengel et al., 2017; Cirella, 2016).

While these studies have undeniably advanced our comprehension of the factors shaping organizational creativity, they exhibit substantial limitations due to their primary emphasis on connecting organizational creativity in relation to the abilities of individuals or the characteristics of groups and their context. This approach neglects a comprehensive exploration of the broader organizational attributes, processes, and routines that facilitate and support individual and collective creativity. To overcome these limitations, we propose an organizational capacity approach to creativity which Napier and Nilsson (2006) refer to as "organizational creative capabilities." In their pioneering study, Napier and Nilsson were the first to attempt to integrate creativity into the framework of organizational capabilities. That important step that has since been recognized by other researchers (MacLean et al., 2015). In our opinion, these OCCs highlight a level of organizational creativity that has not been sufficiently or comprehensively studied but is nonetheless of key importance in explaining organizations' creative performance.

Derived from the resource-based view theory, an organizational capability is defined as "a high-level routine (or collection of routines) that, together with its implementing input flows, confers upon an organization's management a set of decision options for producing significant outputs of a particular type" (Winter, 2003, p. 991). While there has been much debate about the main components of capabilities, i.e., processes, routines, resources, or even competencies, it is generally accepted that "routines are the building blocks of capabilities—although routines are not the only building blocks of capabilities" (Dosi, Nelson, & Winter, 2000, p. 4).

In this extensive literature, authors tend to separate two capability types: (1) Operational (or ordinary) capabilities focused on achieving operational excellence, streamlining workflows, and ensuring consistent performance in day-to-day activities. Operational capabilities are typically aligned with a company's current resources, processes, and technologies, with the aim of enhancing productivity and reducing costs; and (2) Dynamic capabilities, which are strategic in nature, involving an organization's ability to adapt, innovate, and respond effectively to rapidly changing environments and emerging opportunities (Teece, 2007). Unlike operational capabilities, dynamic capabilities emphasize creativity, flexibility, learning, and long-term strategic thinking (Schilke, et al., 2018).

Creative capabilities, which we define, based on the work of Napier and Nilsson (2006), as the ability to continuously foster creative behaviors and actions for the generation of valuable ideas, fall into the latter

category. They belong to what Teece (2018) calls “high-order capabilities” to highlight the complementarities, substitutions, and entanglements between the different capabilities’ components. As Teece (2014) puts it, these types of capabilities are more than the sum of routines and are usually the results of a complex arrangement of routines, processes, and resources that have developed over time.

Within dynamic capabilities, we also find other related types of capabilities, such as innovation capabilities, learning capability and absorptive capacity, each characterized by distinct definitions and focuses. While creative capabilities revolve around fostering creative endeavors, innovation capabilities encompass routines and processes that allow creative ideas to be turned into tangible products, services, or processes that provide value to customers or the organization itself (Lawson & Samson, 2001). Innovation capabilities involve routines such as fast prototyping, parallel experimentation of ideas, alliance, and acquisition to transform creative ideas into practical implementations (Mendoza-Silva, 2021). Learning capabilities center on the “organizational learning process or allow an organization to learn and thus develop a learning organization” (Chiva & Alegre 2009, p. 325). Absorptive capacity, on the other hand, focuses on the integration of external knowledge and encompasses “the ability of the firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends” (Cohen & Levinthal, 1990, p. 128).

These various capabilities are mutually reinforcing. For example, creative capabilities play a crucial role in fostering creative behaviors and the reservoir of ideas that will ultimately fuel innovative capabilities. However, their distinct nature in terms of objects and constituent elements draws boundaries that also allow them to exist independently of each other. Creative capabilities can, for example, promote swift responses and adaptability to various challenges. At the same time, innovation capabilities can take advantage of collaborative dynamics with external parties to implement creative ideas. Table 1 highlights some of these differences by going back over the definitions and central focus of each of these various capabilities.

Table 1 Learning capability, absorptive capacity, creative capabilities, and innovation capabilities: Definitions and focus

	Learning capability	**Absorptive capacity**	**Creative capabilities**	**Innovation capabilities**
Authors	Jerez-Gomez et al., 2005; Chiva & Alegre, 2009	Cohen & Levinthal, 1990; Zahra & George, 2002; Todorova & Durisin, 2007	Napier & Nilsson, 2006	Lawson & Sanson, 2001; Vicente & Abrantes, 2015 Mendoza-Silva, 2021
Definition	The organizational and managerial characteristics that facilitate the organizational learning process	The company’s ability to recognize the value of new, external information, assimilate it, and apply it to commercial ends	The ability to continuously foster creative behaviors and actions for the generation of valuable ideas	The ability to continuously transform knowledge and ideas into new products, processes, and systems for the benefit of the company and its stakeholders.
Focus	Learning process	Information and knowledge integration process	Ideas and creative behaviors	Projects and structures

Building on past research on capabilities, many recent works have attempted to explore the microfoundations of these subcapabilities to better understand their dimensions and make the concept more operational (e.g., Warner & Wäger, 2019; Danneels, 2016). However, while a growing number of studies has

tended to demonstrate close links between routines and organizational creativity (Catmull, 2008; Cohendet & Simon, 2016; Sonenshein, 2016), and there is evidence that organizational routines can foster creative behaviors (Beretta et al., 2018; Björk et al., 2010; Darvishmotevali et al., 2020; Ozer & Zhang, 2022; Tang, 2016), the literature still lacks an integrative model for capturing OCC dimensions.

Developing a theoretical framework for organizational creative capabilities

To build a framework for identifying the fundamental organizational facets of OCCs and making the concept more operational, we began by conducting a rigorous examination of the literature, spanning 21 prominent journals[1] in management, innovation management, marketing, and psychology. By strategically employing keyword searches incorporating terms like "creativity," "creative," and "idea OR ideas" of article titles, we conducted a meticulous examination of a total of 417 articles, all of which were published between 1999 and 2022. After a careful assessment of the abstracts of these articles, we selected 76 that offered specific insights into organizational routines that were pertinent to nurturing organizational creativity. Through a thorough analysis of these articles, we were able to identify five distinct dimensions within the OCC model (Table 2): "idea socialization routines" (discussed in 26 articles), "idea management routines" (explored in 25 articles), "external openness routines" (touched upon in 21 articles), "creative equipment routines" (addressed in eight articles), and "internal agility routines" (investigated in four articles). Once we had identified the OCC model dimensions, we extended the literature review to other journals. We pursued this extension with the overarching goal of gaining a comprehensive understanding of the unique characteristics and routines intricately connected with each of the identified dimensions. The results of these theoretical investigations are detailed below.

Table 2 OCC dimensions from the literature review[2]

Dimensions	#	Key references	Description
Internal idea socialization routines	26	Mannucci, 2022; Zhou et al., 2022; Ozer & Zhang, 2022; Bain et al., 2021; Satterstrom et al., 2021; Deichmann et al., 2021; Kim & Kim, 2020; Gray et al., 2020; Deichmann et al.; 2020; Soda et al., 2019; Hasan et Koning, 2019; Koch et al., 2018; Harrison & Dossinger, 2017; Harrison & Rouse, 2015; Liangding, 2014; Reay et al., 2013; Baer, 2012; Gong et al., 2012; De Stobbeleir et al., 2011; Sosa, 2011; Björk & Magnusson, 2009; Perry-Smith, 2006; Hargadon & Bechky, 2006; Shalley et al. 2004; Madjar et al., 2002; Drazin et al., 1999	These routines are examined extensively in the literature. The authors characterize them as repetitive patterns of actions that an organization mobilizes to facilitate the sharing, discussion, and collective refinement of creative ideas among its members.
Idea management routines	25	Chen & Althuizen, 2022; Gamber et al., 2022; Hofstetter et al., 2021; Kornish & Jones, 2021; Harvey & Mueller, 2021; Sukhov et al., 2021; Deichmann et al., 2020; Beretta, 2019; Schweisfurth & Dharmawan, 2019; Zhu et al., 2019; Thompson, 2018; Koch et al., 2018; Jing et al., 2017; Cohendet & Simon, 2016; Eling et al., 2016; Harrison & Rouse, 2015; Lan Luo & Toubia, 2015; Ende et al., 2015; Harvey & Kou, 2013; Baer, 2012; Hammedi et al., 2011; Rovik, 2011; Kijkuit & Ende, 2007; Vandenbosch, 2006; Hargadon & Bechky, 2006; Shalley et al., 2004	These routines can be defined as the sets of actions and activities adopted by an organization to actively generate, collect, store, improve, and evaluate creative concepts and ideas.
External openness routines	21	Chen & Althuizen, 2022; Althuizen et al., 2022; Hofstetter et al., 2021; Cornelius et al., 2020; Buenstorf & Heinisch, 2020; Vinokurova & Kapoor, 2020; Soda et al., 2019; Hasan & Koning, 2019; Homfeldt et al., 2019; Boons & Stam, 2019; Koch et al., 2018; Perry-Smith & Mannucci, 2017; Gurtner et al., 2016; Schemmann et al., 2016; Walsh & Nagaoka, 2016; Salter et al., 2015; Langner, 2015; Gong et al., 2012; Poetz & Schreier, 2012; Leimeister et al., 2009; Björk & Magnusson, 2009	These routines have been characterized by multiple authors as the active pursuit and integration of novel knowledge and ideas, through engagements with a wide array of external stakeholders, to encourage inspiration, bisociation, and creative recomposition within an organization.
Creative equipment routines	8	Jia et al., 2022; Gamber et al., 2022; Curhan et al., 2021; Ortmann & Sydow, 2018; Austin et al., 2012; Hirst et al., 2009, Shalley et al., 2004; Bharadwaj & Menon, 2000	These routines involve strategically equipping individuals and teams with the methodologies, tools, and theories of creativity and innovation, as well as with stimulating physical environments. The aim is to enhance their capacity for initiating creative actions and embracing creative behaviors.
Internal agility routines	4	Cohendet & Simon, 2016; Harrison & Rouse, 2015; Obstfeld, 2012; Barrett, 1998	These routines have received relatively less attention in the creativity literature than other routines. They involve a swift organizational reaction to changes in the environment, agile exploration to capitalize on opportunities, and the seamless integration of organizational learning.

Internal idea socialization routines

Organizational creativity has been linked to collective achievement (Drazin et al., 1999; Hargadon & Bechky, 2006), where interactions and collaboration between individuals play a key role in the development of individual and collective creativity (Ozer & Zhang, 2022). In this respect, many studies have demonstrated the importance of *socialization routines* that enable employees to discuss ideas (Chua et al., 2010), get feedback on their actions (Harrison & Rouse, 2015; Kim & Kim, 2020), and, more broadly, interact to share knowledge, information, and even contacts (Giustiniano et al., 2016; Hasan & Koning, 2019; Deichmann et al., 2020). As Slavich and Svejenova (2016) note, an appropriate organizational context with specific devices, spaces, and organizational structures that favor social interactions among individuals may lead to new interpretations and discoveries that they could not generate alone.

Hargadon and Bechky (2006) show that the social interaction routines of help seeking, help giving, reflective framing, and reinforcing are central to the processes that lead to the emergence and refinement of creative solutions. Similarly, based on a study of a software company department, Sosa (2011) shows that if people frequently interact with individuals with a wide range of knowledge domains, they are more likely to trigger creative ideas. Finally, in their study of a Swedish company, Björk and Magnusson (2009) demonstrate that an increase in the number of connections between individuals increased the propensity for high-quality creative ideas. Hence, they argue that, to support organizational creativity, the organization should support and facilitate individuals' opportunities to interact with others.

Idea management routines

Organizations can rely on idea management routines to stimulate generation and collection of creative ideas (Björk et al., 2010; Froehlich et al., 2016; Eling et al., 2016). Idea management systems include computer processes to collect, improve, and evaluate internal or external ideas (Van den Ende et al., 2015; Gerlach & Brem, 2017). Idea management platforms and systems enable companies to generate pools of creative ideas from large numbers of employees (Beretta, 2019). These initiatives are deployed to enable the organization to accumulate, enrich, and remobilize creative ideas over time. Moreover, formal idea systems are often accompanied by processes designed to capture, translate, and select ideas properly to enable the organization to obtain stronger COs (Bakker et al., 2006; Harvey & Kou, 2013; Gamber et al., 2022; Sukhov et al., 2021).

Idea management also depends on the organizational routines that are used to store creative ideas. For example, in their pioneering article on the creative levers implemented by IDEO (a company specializing in new product development), Hargadon and Sutton (1997) note that one of the central components of IDEO's creative capabilities was its ability to constantly store and remobilize ideas and knowledge accumulated by past projects, with the company's designers able to redeploy and transform that information in new projects. This is what Cohendet and Simon (2016) call "creative slack," which is composed of a myriad of creative ideas and solutions developed by individuals and teams during their past activities and projects. Those ideas and solutions either accumulate in formal systems or in the memories of groups and communities within an organization.

Moreover, to encourage the generation of ideas on particular themes, a growing number of companies also organize internal competitions designed to identify high-quality creative ideas. Such events have received increasing attention in the literature (Elerud-Tryde & Hooge, 2014; van den Ende et al., 2015; Zhu et al., 2019). These internal competitions are a way for companies to tap into their employees' creative potential and steer the development of their ideas (Deichmann et al., 2021).

External openness routines

The search for and acquisition of new knowledge and ideas during weak or strong interactions between individuals supports their creativity (Perry-Smith & Mannucci, 2017; Sosa, 2011). Organizations that can work with and draw ideas and knowledge from external openness routines that involve numerous actors outside their boundaries are generally better equipped for being creative (West & Bogers, 2014). Several studies have indicated that external connections bring diversified knowledge, which can improve and broaden individual perspectives and stimulate creative problem-solving and creativity (Chen et al., 2008; Shalley & Perry-Smith,

2008; Tang, 2016). These external connections can be developed by encouraging networks with external actors such as scientists (Walsh et al., 2016), start-ups, suppliers (Homfeldt et al. 2019), and consumers (Chen & Althuizen, 2022), or by developing technology acquisition strategies (Vanhaverbeke et al., 2002).

Companies can deploy several organizational systems to develop their creativity by opening their boundaries. Boons and Stam (2019) argue that organizations can obtain valuable ideas and suggestions that serve as inputs when they open their creative processes to outsiders through crowdsourcing. Opening up to working with users or communities of users can also lead to the generation and selection of more creative ideas (Dahlander & Magnusson, 2008; Kristensson et al., 2002; Parmentier & Mangematin, 2014).

Organizations may also choose to access creative ideas more directly by developing in-house start-up incubators or accelerators. This can lead to internal cross-contamination effects (Richter et al., 2018). Moreover, other studies have shown that encouraging participation in external events and integration into innovation networks or communities tends to strengthen organizations' creative potential (Doehne & Rost, 2021; Langner & Seidel, 2015). Finally, companies can use research mechanisms such as benchmarks and technology listening posts to gain inspiration from other industries (Gassmann & Gaso, 2004).

Creative equipment routines

Amabile (1988) was one of the first to discuss the importance of individuals' "creativity-relevant skills" for creativity. She argues that such skills can vary according to an individual's experience and traits but can also be developed through training. Several authors have demonstrated that equipping individuals and teams in an organization with methods, artifacts, and theories of creativity and innovation can have favorable effects on their ability to perform creative actions and behaviors (Hirst et al., 2009; Seidel & Fixson, 2013; Valgeirsdottir & Onarheim, 2017; Ortmann & Sydow, 2018).

Seidel and Fixson (2013) show that adoption of "design thinking methods" in novice teams is not only useful for concept generation but also for selection processes and increasing team reflexivity by enabling more debate on ideas or by working to strengthen the creativity of certain concepts. In a longitudinal study of the effects of training on creativity and innovation methods, Rampa and Agogué (2021) demonstrate that these methods can develop individual creative skills, federate and catalyze collective exploration through common methods, and help to create a common language and vocabulary between different groups or divisions in an organization to work on innovation initiatives.

Finally, creative equipment routines also include spaces designed by organizations. As Amabile (1996, p. 249) points out, "physical environments that are engineered to be cognitively and perceptually stimulating" can enhance creativity. Hence, organizations can provide employees with various areas in which to perform activities that are outside their routines (Bouncken et al., 2021), privileged areas in which to collaborate with internal and external people (Magadley & Birdi, 2009), and areas dedicated to the design of and experimentation with new solutions (Boutillier et al., 2020).

Internal agility routines[3]

Internal agility is related to the organizational ability to react quickly to changes in the environment (Charbonnier-Voirin, 2011), as well as the ability to learn and seize new opportunities by testing new ideas quickly. Obstfeld (2012) refers to the concept of contingency management to describe the set of routines that an organization develops in response to exceptions or uncertainties in the course of organizational projects or actions. To become agile, a company must be able to mobilize rapid responses (Faraj & Xiao, 2006), read the market (Škare & Soriano, 2021), and embed organizational learning (Charbonnier-Voirin, 2011).

A handful of studies have demonstrated the impact of internal agility on COs (Hill et al., 2014). For example, Darvishmotevali et al. (2020) show that, in the turbulent hotel industry, internal agility moderates the negative impact of uncertainty on organizational creativity. Cohendet and Simon (2016) show that, during a major crisis, the Ubisoft video game studio in Montreal preserved the creativity of its teams by radically modifying its project management method with the introduction of two key principles: "Fail faster" and "Follow the fun." Agility is thus based on experimentation, which results in learning that promotes creative

ideas and outcomes (Hill et al., 2014). At the team level, time and task agility favor intrinsic motivation and creative behavior (Franco & Landini, 2022).

Finally, by enabling companies to act more quickly in the face of an uncertain, changing, or turbulent environment, internal agility requires a higher level of responsiveness, expressiveness, and experimentation from employees, and this positively influences organizational creativity (Fisher & Amabile, 2008). Harrison and Rouse (2015) show, for example, that organizations can develop artifact-centered routines, such as meetings to challenge prototypes, through which they can quickly receive a lot of feedback and learning to drive change in creative ideas and behaviors.

Toward a scale to measure organizational creative capabilities

After constructing a framework for understanding the different dimensions of OCCs, we sought a more operational use of the concept by developing and validating a measurement scale that would provide quantitative evidence of its existence and develop a new measurement standard for approaching organizational creativity.

Indeed, while many scales already exist for capturing creativity at the individual level (Elisondo, 2021; Silvia et al., 2012), the main scales built for capturing creativity at the organizational level primarily measure creativity in the organizational climate. One of the most frequently used scales, KEYS, was developed by Amabile et al. (1996). It mobilizes eight major dimensions to evaluate the work environment for creativity. It includes aspects relating to freedom, challenging work, managerial and organizational encouragement, realistic workload pressures, and sufficient resources. Ekvall's measurement scale (Ekvall, 1996), which is also frequently used in the literature, differs from KEYS in that it integrates dimensions such as trust, dynamism, and playfulness in an attempt to capture aspects of the work climate likely to influence an organization's creative performance.

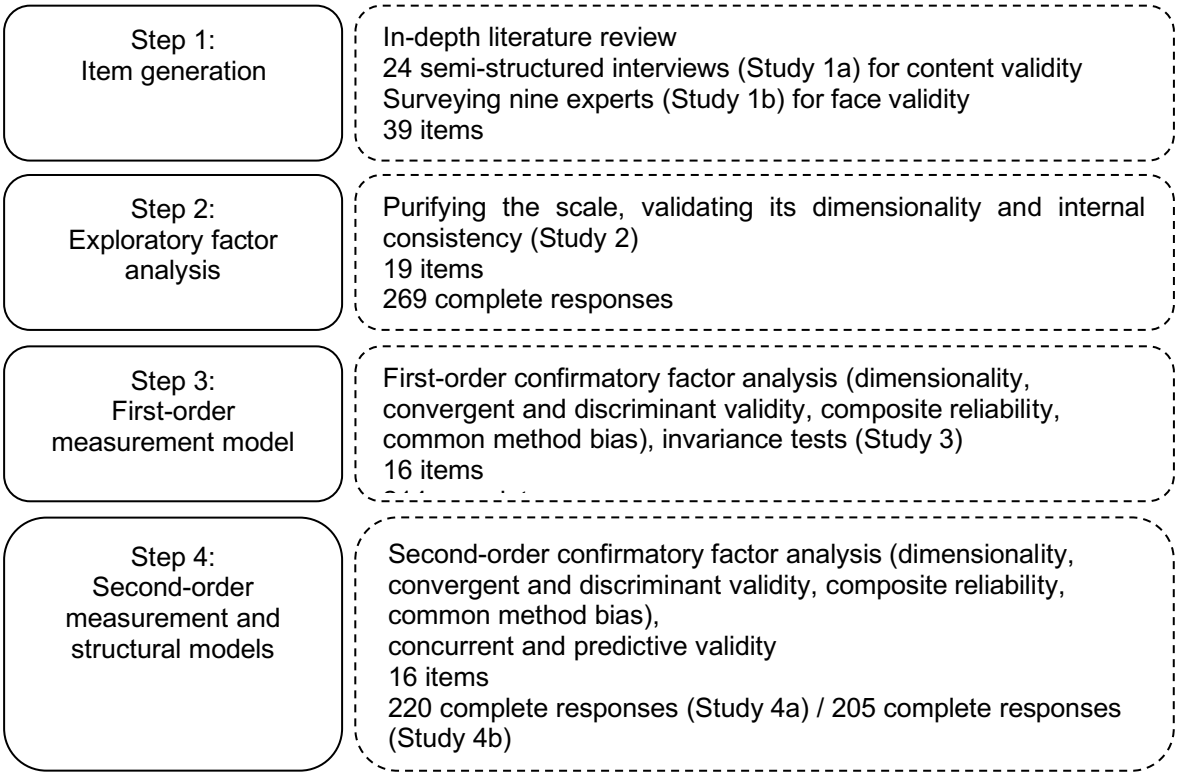
Other capability measurement scales similar to the OCC construct exist, but their dimensions differ greatly from those identified in our research. Innovation capability measurement scales focus on the transformation of ideas into innovation by relying on dimensions such as product, market, process, behavior, and strategic innovativeness (Wang & Ahmed, 2004), or client-focus, marketing-focus, technology-focus innovation capability. Finally, the absorptive capacity scale focuses on knowledge, with dimensions such as knowledge acquisition, knowledge assimilation, knowledge transformation, and knowledge exploitation (Flatten et al., 2011), without taking into account the impact of these routines on creative actions and behaviors. Our research therefore addresses this gap by implementing the methodology proposed by Churchill (1979) to build a multidimensional scale for measuring OCCs.

SCALE DEVELOPMENT METHODOLOGY

To develop a reliable, valid OCC scale, we mainly followed the process recommended by Churchill (1979) and Nunnally (1978). Figure 1 outlines the four-step process. In the first step, we generated a list of items corresponding to each of the OCC construct's five dimensions (internal idea socialization routines, idea management routines, external openness routines, creative equipment routines, and internal agility routines). To achieve *content validity*, defined as the extent to which the list of items generated are representative of the whole dimension they are aimed at measuring (Nunnally & Bernstein, 1994), and *face validity*, based on the research community's judgment regarding the suitability of the items to the concept studied (Anastasi, 1988), we used three sources of information: (1) an extensive review of the literature on organizational creativity; (2) a qualitative study involving a group of 24 directors, project managers, and experts from various creative industries (Study 1a); and (3) a study of nine senior researchers in the field of innovation management to assess the suitability of the items for the construct studied (Study 1b). In the second step, we purified the OCC scale and checked its dimensionality internal consistency on a sample of 269 complete responses collected in France and Canada (Study 2). Steps 3 through 4 of the process were devoted to refining the scale structure. We carried out first-order and subsequently second-order CFAs following the guidelines established by Brown (2006). Throughout these steps, our main objective was to establish *construct validity*, which indicates the scale's ability to measure the underlying theoretical construct as intended and assessed through the lens of both *convergent* and *discriminant validity* measures. In

alignment with this approach, in the third step, we conducted a first-order CFA and invariance tests on a sample of 214 complete responses mostly collected in the United States and Europe (Study 3). In the fourth step, we performed a second-order CFA and undertook an assessment of the *criterion validity*—which refers to the degree of correlation between the OCC scale and external, well-established scales, and includes both *concurrent* and *predictive validity*—on a sample of 220 complete responses mostly collected in the United States and Europe (Study 4a). Finally, we generalized the results of Study 4a to an international sample of 205 complete responses and reinforced predictive validity (Study 4b).

FIGURE 1 Steps in scale development



Step 1: Item generation

Guided by the conceptual framework presented below, we initiated the process by creating OCC items that drew from literature articles and scales exhibiting strong psychometric properties. This initial foundation was subsequently enhanced through 24 semi-structured interviews with industry professionals. The origin of each item is detailed in Appendix C. Twenty items were derived from scales and literature interpretation, nine emerged from Study 1a, and one item was suggested by an expert in Study 1b. For the items sourced from the literature, particularly those related to the *internal idea socialization routine*, we extracted items from the scale developed by Pérez López et al. (2004) on collaborative practices and from the work of Hargadon and Bechky (2006) and Björk and Magnusson (2009). Those mainly concern regular exchanges and discussions between an organization's employees as well as events and meetings organized for the purpose of exchanging ideas. Concerning the *creative equipment routine*, we drew on items from several studies on materials and cognitive equipment regularly implemented by organizations to stimulate their employees' creativity (Woodman et al., 1993; Wang & Horng, 2002; Rampa & Agogué, 2021).

To generate *idea management routine* items, we referred to research on the organization of frequent idea collection and selection processes (Gerlach & Brem, 2017; Gamber et al., 2022; Zhu et al., 2019; Cohendet & Simon, 2016; Elerud-Tryde & Hooge, 2014; Bakker et al., 2006; Boeddrich, 2004). We created *external openness routine* items based on Rangus et al.'s (2016) scale and Salter et al.'s (2015) research on implementation of regular outward-facing practices with various external actors to generate new creative ideas. Finally, we created *internal agility routine* items based on the Charbonnier-Voirin (2011) scale and

Lindkvist et al.'s (2017) research focusing on the ability to follow market changes and respond quickly to them.

Qualitative study (Study 1a)

We carried out a qualitative study (Study 1a) with a group of directors, project managers, and experts in various industries in which creativity is central (see Appendix A1). We conducted 24 semi-structured interviews guided by previous research on organizational creativity. The main purpose of the interviews was to validate the expected dimensionality of OCCs. The interviews were recorded and transcribed. We performed a progressive thematic analysis of the interviews which resulted in a coding grid with semantic saturation that synthesized the themes (Miles & Huberman, 1994). Coding was carried out using Atlas.ti software, which facilitates the grouping of codes according to the subcategories and broad themes we created in our research. Appendix A2 presents the illustrative verbatim statements extracted from the interviews.

This qualitative study allowed us to verify the five OCC dimensions and confirm the presence of organizational routines within each dimension. Our analysis revealed a new dimension, "organizational agility," which was subsequently corroborated by the literature review. Furthermore, in accordance with content validity, the study ensured that the items of each of the OCC dimensions were representative of the dimension and covered all its aspects. Thus, we identified nine new items that enriched the OCC scale (see Appendix C).

Face Validity (Study 1b)

Nine innovation management researchers validated the OCC scale's content and suggested improvements (Study1b). The expert panel was made up of five female and four male individuals, all possessing doctoral-level expertise in the field. After a brief introduction to the study context, the experts were asked to indicate the extent to which they believed the proposed items in a given dimension of the OCC scale characterized the dimensions (internal idea socialization routines, idea management routines, external openness routines, creative equipment routines, and internal agility routines), which were presented randomly. Each item was rated on a four-point relevance scale (Not relevant = 1; Slightly relevant = 2; Moderately relevant = 3; Highly relevant = 4). They were then asked to indicate whether they thought that some aspects of a specific dimension were not covered by the proposed items (open question) and whether they had any comments on the proposed items (open question).

To assess the extent to which the experts agreed that items are relevant to each OCC dimension, we then calculated four forms of content validity indices (CVIs) based on the experts' ratings and corresponding to the (Rossiter, 2008): (1) item-level content validity index (I-CVI);[4] (2) scale-level content validity index for proportional agreement (S-CVI PR);[5] (3) scale-level content validity index for average (S-CVI Ave);[6] and (4) scale-level content validity index for universal agreement (S-CVI UA).[7] The accepted threshold for these four forms of CVI values is 0.780 or higher, as recommended by Lynn (1986), to signify a substantial level of agreement. After calculating the CVIs for each dimension, the resulting values for all dimensions exceeded the 0.780 threshold, thus revealing a solid content validity. At the end of the generation phase, we adopted a set of 39 items for the next steps (see Appendix C) in the scale development process.

Step 2: Exploratory factor analysis

Sample and procedure

Study 2 was aimed at validating the OCC scale's multidimensional structure, refining its measurement, and ensuring that internal consistency was acceptable for each dimension. The data were collected in France (73.977%) and Quebec, Canada (26.022%), between March and July 2021. We collected 365 responses, of which 269 were complete. Questionnaires were administered online using a Qualtrics interface. The data were collected online through invitations on LinkedIn (68.773%) and through Qualtrics (25.278%) and Prolific (5.947%) panels. As outlined in Appendix B, the sample encompasses a wide range of industries. Notably, 47.584% of the observations come from industries explicitly classified as "creative industries" by both the UK Department for Digital, Culture, Media and Sport[8] and the United Nations Conference on Trade and

Development.[9] These observations from qualified creative industries come from advertising (8.550%), architecture (9.665%), crafts, design, and various arts (10.781%), media and publishing (3.346%), and video games (15.242%). The remaining 52.416% of observations come from the software sector (20.446%), consulting, training, and finance (10.409%), health, nongovernmental organizations (NGOs), administration (4.089%), and various secondary and tertiary industries (17.472%). Participants' responses show heterogeneity in terms of organization size and gender distribution (68.773% men and 31.226% women, with a mean age of 36.851 years and a standard deviation of 11.131 years). Furthermore, the diversity is evident in participants' professional designations, particularly in terms of their hierarchical positions: 21.561% are directors, 50.558% are managers, and 23.420% are general employees. The remaining 4.461% did not indicate their function.

Respondents were invited to complete the questionnaire. Various precautions were taken during data collection to limit any response bias, especially method bias (Podsakoff et al., 2003). In the introductory phase of the questionnaire, we specified that the respondents' anonymity would be respected and that there were no right or wrong answers. The order of the questions was randomized using the "randomization" function in the Qualtrics interface. We favored simple, precise, and clear wordings that did not reveal the purpose of the study. A pretest of the questionnaire was carried out. We included an attention-check question to measure respondent engagement and, in the final sample, we excluded respondents who did not answer this question correctly ("If you're reading this, click 'Not at all agree'"). We included in the questionnaire the 39 items relating to the expected dimensions of OCCs (see Appendix C) derived from the item generation phase (Step 1). For Study 2, the questionnaire was administered in French to align with the respondents' native language. Subsequently, a professional editor, proficient in both French and English, translated the questions into English after the administration process.

Results

Preliminary analysis. Using SPSS 28 software, we ensured that we had single responses by scanning the IP addresses to verify that no addresses were duplicated. To ensure the highest quality of responses, we undertook an analysis of the responses to the attention-check question. Moreover, we evaluated the consistency of the response collection. This comprehensive evaluation encompassed the calculation of metrics indicative of central tendency and dispersion, as well as an exploration of the correlation matrix. We subsequently conducted a normality test that revealed the data to exhibit a normal distribution.

Principal component analysis (PCA). We examined factorization conditions before proceeding with the factor analysis using the Varimax method. The Kaiser–Meyer–Olkin (KMO) value was 0.911 (> 0.900), and the *p*-value for Bartlett's test was 0.000 (< 0.050), thus indicating that our data are factorizable. PCA using Varimax rotation was employed to extract the dimensions explaining the most variance, thus verifying the model's dimensionality and obtaining eigenvalues greater than 1, with a percentage of cumulative variance greater than 70. The exploratory analysis confirmed the existence of five dimensions within OCCs and resulted in a 19-item model (see Appendix C). The model had eigenvalues exceeding 1 and a cumulative explained variance of 70.879%. Reliability tests for each dimension showed strong values ranging from 0.748 to 0.899 (see Table 3).

Table 3 PCA results and reliability (Study 2)

Items	Communalities	Factor 1: Creative equipment routines	Factor 2: Idea management routines	Factor 3: Internal agility routines	Factor 4: Internal idea socialization routines	Factor 5: External openness routines
CER 1	0.778	**0.827**	0.226	0.114	0.030	0.172
CER 2	0.761	**0.760**	0.298	0.169	0.229	0.118
CER 3	0.747	**0.829**	0.135	0.146	0.064	0.127
CER 4	0.570	**0.638**	0.313	0.211	0.142	0.018
CER 5	0.776	**0.802**	0.229	0.147	0.079	0.229
IMR 1	0.822	0.322	**0.794**	0.167	0.119	0.213
IMR 2	0.785	0.193	**0.762**	0.304	0.178	0.206
IMR 3	0.613	0.316	**0.601**	0.243	0.250	0.174
IMR 4	0.712	0.353	**0.752**	0.106	0.013	0.099
IAR 1	0.725	0.194	0.103	**0.813**	0.096	0.079
IAR 2	0.756	0.039	0.250	**0.792**	0.222	0.122
IAR 3	0.644	0.229	0.173	**0.646**	0.272	0.265
IAR 4	0.527	0.230	0.167	**0.616**	0.097	0.238
IISR 1	0.820	0.066	0.043	0.179	**0.883**	0.032
IISR 2	0.824	0.127	0.157	0.156	**0.865**	0.104
IISR 3	0.528	0.208	0.241	0.257	**0.522**	0.298
EOR 1	0.748	0.066	0.155	0.245	0.160	**0.796**
EOR 2	0.760	0.192	0.174	0.153	0.052	**0.817**
EOR 3	0.573	0.438	0.181	0.147	0.099	**0.562**
Explained Variance	**70.879%** (Total)	20.034%	14.473%	13.853%	11.436%	11.083%
Cronbach's alpha		0.899	0.866	0.809	0.766	0.748

N = 269; Model validated by IBM SPSS 28 software using PCA factor analysis with Varimax rotation.
Dimensions are presented in ascending order of their percentage of variance explained.

Common method bias (CMB). To assess CMB, we performed the Harman single factor test using SPSS 28 software. All 19 selected items were included in the analysis. The results show that the total explained variance for one dimension is 42.790%, which is less than 50.000% and well below the 70.879% explained variance for all five dimensions. This suggests that the likelihood of CMB in the collected data is low.

Correlation between dimensions. We examined the correlation matrix between the dimensions. According to Guildford's reference values (1973),[10] correlations between the dimensions present in the matrix are mostly moderate (Appendix G1).

Step 3: Testing first-order model

Sample and procedure

The sample for Study 3 comprised 214 complete responses out of 413 responses. As with Study 2, we collected data in creative industries (40.187% of the sample) and other industries (59.813% of the sample). The observations from qualified creative industries come from advertising (0.935%), architecture (9.346%), crafts, design, and various arts (8.411%), media and publishing (3.738%), and video games (17.757%). The remaining 59.813% of observations are from the software sector (23.364%), consulting, training, and finance (10.280%), health, NGOs, and administration (8.879%), and various secondary and tertiary industries (17.757%). Data were collected between October 2021 and February 2022. As indicated in Appendix B, 45.794% and 28.037% of the responses were collected in the United States and Europe, respectively, with 26.168% in other locations. Various respondent profiles (with 76.635% identifying as men, 20.093% as women, and 3.272% as nonbinary, with an average age of 37.761 and a standard deviation of 12.423) were surveyed: 28.037% are directors, 39.252% are managers, 29.907% are general employees, and the remaining 2.804% did not indicate their function. Data were sourced online through LinkedIn. We included the 19 items (see Appendix C) from the exploratory factor analysis (Step 2). The questionnaire was administered in English.

Results

Preliminary analyses. Using SPSS 28 software, we checked the consistency and plausibility of the series of answers against the questions measured on interval scales by calculating central tendency measurement indicators and dispersion, and by analyzing the correlation matrix (see Appendix D1).

Factor structure, reliability, and CMB. To ensure the consistency of the Study 2 and Study 3 results, we conducted a PCA using the 19 items selected in Study 2. We examined the factorization conditions before performing factor analysis using Varimax rotation. The significance of the Barlett's test (p = 0.000) and the value of the KMO index (0.880) indicated that the data are factorizable. The item communality values are acceptable, ranging from 0.577 to 0.853. The dimensions explain 70.334% of the total variance. Finally, Cronbach's alpha values range from 0.781 to 0.863, thus highlighting the model's internal reliability (Table 4). We performed the Harman single factor test using SPSS 28 software. The results show that the total explained variance for one dimension is 40.009%, which is less than 50.000% and well below the 70.334% explained variance for all five dimensions. This suggests that there are low or no CMB issues in the data collected.

Table 4 PCA results and reliability (Study 3)

Items	Communalities	Factor 1: Creative equipment routines	Factor 2: Internal agility routines	Factor 3: Internal idea socialization routines	Factor 5: Idea management routines	Factor 4: External openness routines
CER1	0.720	**0.792**	0.106	0.057	0.257	0.110
CER2	0.664	**0.697**	0.246	0.119	0.209	0.246
CER3	0.630	**0.756**	0.160	0.046	0.127	0.118
CER4	0.589	**0.691**	0.249	0.138	0.079	0.152
CER5	0.650	**0.709**	0.156	0.145	0.309	0.080
IAR1	0.714	0.224	**0.783**	0.128	0.152	0.104
IAR2	0.850	0.154	**0.833**	0.282	0.205	0.102
IAR3	0.825	0.209	**0.834**	0.228	0.180	0.033
IAR4	0.577	0.215	**0.668**	0.168	0.076	0.225
IISR1	0.816	0.052	0.237	**0.862**	0.105	0.048
IISR2	0.853	0.185	0.254	**0.858**	0.112	0.071
IISR3	0.688	0.101	0.152	**0.782**	0.153	0.140
IMR1	0.717	0.301	0.218	**0.106**	0.751	0.062
IMR2	0.700	0.112	0.202	0.248	**0.744**	0.179
IMR3	0.640	0.255	0.370	0.336	**0.525**	0.221
IMR4	0.606	0.364	0.044	0.001	**0.671**	0.146
EOR1	0.710	0.166	0.147	0.152	0.158	**0.783**
EOR2	0.665	0.307	0.160	0.062	0.085	**0.731**
EOR3	0.751	0.063	0.058	0.050	0.134	**0.850**
Explained Variance	**70,334%** (Total)	17.388%	16.078%	13.379%	11.954%	11.535%
Cronbach's alpha		0.856	0.877	0.863	0.793	0.781

N = 214; Model validated by IBM SPSS 28 software using PCA factor analysis with Varimax rotation.
Dimensions are presented in ascending order of their percentage of variance explained.

Measurement model. To test the first-order measurement model, we performed CFA using SPSS AMOS 28 software.[11] We evaluated the model's goodness-of-fit by following Hu and Bentler's (1998) recommendations against the goodness-of-fit index and the standardized root mean square residual (SRMR), supplemented by one of the following indices: root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker–Lewis index (TLI), and PCLOSE. CFA was performed to test the measurement model and confirm the suitability of each dimension. Results were satisfactory according to the usual standards ($Chi^2/94$ = 1.401; RMSEA = 0.043; TLI = 0.972; CFI = 0.978; SRMR = 0.047; PCLOSE = 0.726). The measurement model was confirmed to be robust, as the Bollen–Stine bootstrap with 500 samples test showed that the model was correct (p = 0.110). Parameter analysis estimation could therefore be carried out. Three items were excluded for statistical reasons: on the basis of modification indices, the deletion of item CER5 was recommended, and items IMR4 and IAR4 were eliminated due to their low standardized coefficients in relation to their respective

latent constructs. This refinement resulted in a final number of 16 items in the OCC. As indicated in Appendix E1, an analysis of parameters shows that each of the measurement variables is significantly related to the latent construct specified in the model. As indicated in Table 5, the model supports convergent validity (average variance extracted [AVE] for the five dimensions is > 0.500), discriminant validity (AVE > maximum shared squared variance [MSV], and the square root of AVE is greater than the interfactor correlation), and composite reliability (CR) (values > 0.783).

Table 5 Reliability and convergent and discriminant validity

	CR	AVE	MSV	1.	2.	3.	4.	5.
1. Internal idea socialization routines	0.868	0.689	0.348	**0.830**				
2. Idea management routines	0.790	0.560	0.490	0.590	**0.748**			
3. External openness routines	0.783	0.547	0.308	0.323	0.540	**0.740**		
4. Creative equipment routines	0.828	0.547	0.490	0.397	0.700	0.555	**0.740**	
5. Internal agility routines	0.895	0.742	0.450	0.580	0.671	0.384	0.537	**0.861**

Fit indices: $Chi^2/94 = 1.401$; CFI = 0.978; TLI = 0.972; SRMR = 0.047; RMSEA = 0.043; PCLOSE = 0.726

N = 214; results validated by IBM SPSS AMOS 28 software.

[(a)] Square roots of AVE are noted in bold on the diagonal.

[(b)] Interfactor correlations are shown under the diagonal.

Invariance tests. We performed invariance tests between the two groups of industries (creative industries and other industries) and between locations (we focused on the United States and Europe as they account for over 70.000% of the responses). We began our analysis by testing for *configurational invariance*, which involved testing whether the factor structure represented in the CFA achieves adequate fit when both groups are tested together and freely. The outcomes affirm the presence of configural invariance across both industry groups (creative industries and other industries). The model derived from this analysis demonstrates good fit statistics ($Chi^2/188 = 1.357$; RMSEA = 0.041; TLI = 0.952; CFI = 0.963; SRMR = 0.073; PCLOSE = 0.882). Configurational invariance is also achieved across the two locations (United States and Europe), with the resultant model exhibiting favorable fit indices ($Chi^2/188 = 1.099$; RMSEA = 0.025; TLI = 0.982; CFI = 0.986; SRMR = 0.063; PCLOSE = 0.988). Subsequently, we proceeded to test for *metric invariance*, which involved verifying whether the measurement model's properties remained consistent between the two industry groups. With a Chi-square difference between the constrained and free measurement models of 20.777 for a degrees-of-freedom difference of 16, the invariance hypothesis is well validated ($p = 0.187$) for industries. Regarding the differences between locations, the Chi-square difference between the constrained and free measurement models of 22.500 and a degrees-of-freedom difference of 16 mean that the invariance hypothesis is well validated ($p = 0.128$).

Step 4: Testing second-order models

Theoretical arguments for a second-order reflective construct

Following Brown's (2006) recommendations, we examined the second-order structure of OCC. This involves evaluating the relationship between OCCs and their dimensions, and, by doing so, knowing whether the scale is reflective or formative. A scale is "reflective" when the latent (or unobservable) variable causes changes in its indicators (Bollen & Lennox, 1991). In this case, the latent variable will be responsible for explaining changes in its indicators. Conversely, when the latent variable is formed by its indicators (Bollen & Lennox, 1991), it is a "formative" scale. The OCC model is considered a second-order reflective type (Type I) based on three criteria for reflective scales (Jarvis, Mackenzie, & Podsakoff, 2003): (1) *The causality relationship between the construct and its indicators*. Routines are considered as "propensities to *express* a certain behavior" (Becker, 2004, p. 664), which means that OCCs manifest themselves through the organizational routines identified above, and this highlights the possibility of having a reflective scale for OCCs. (2) *Interchangeability of indicators*. Reflective indicators are interchangeable, whereas formative indicators are not (Jarvis et al., 2003; Bollen & Lennox, 1991). In the OCC model, all routines are considered to have a common theme in the recurrence of actions implemented by the organization, thus suggesting that OCCs are a second-order concept in which the removal of an organizational routine does not alter the essence of the

aforementioned definition of the concept. (3) *Covariation between indicators*. Organizational routines are characterized by their "interdependencies" (Stańczyk-Hugiet et al., 2017, p. 534). These highlight the possibility of having non-weak intercorrelations between dimensions and hence a Type I model.

Sample and procedure

For Study 4a, we collected 249 responses, and accepted 220 complete responses. The data were collected between February and March 2022 from Qualtrics (45.000%), LinkedIn (36.364%), and Prolific (18.636%). We implemented the same protocol as for Study 2 and Study 3. As indicated in Appendix B, the creative industries and other industries provide 31.364% and 68.636%, respectively, of the sample responses. The creative industry observations come for advertising (10.000%), architecture (2.273%), crafts, design, and various arts (10.000%), media and publishing (2.273%), and video games (6.818%). The remaining observations are from the software sector (20.545%), consulting, training, and finance (10.909%), health, NGOs, and administration (24.545%), and various secondary and tertiary industries (12.727%). Some 46.818% of these responses were collected in the United States, 39.545% in Europe, and 13.636% in other locations. Various respondent profiles (with 53.636% identifying as men, 45.000% as women, and 1.364% as nonbinary, with an average age of 39.059 and a standard deviation of 11.117) were surveyed: 28.636% are directors, 42.727% are managers, 25.000% are general employees, and the remaining 3.636% did not indicate their function.

Measures

Appendix C offers a comprehensive overview of the administered items. We used the 16-item scale to measure the OCC construct derived from Step 3. To assess predictive validity, we employed a four-item scale with seven-point semantic differential scales ($\alpha = 0.891$) adapted from Dean et al.'s (2016) work to quantify CO.[12] Moreover, our evaluation encompassed the measurement of creative climate (CC) to establish the distinct nature of the OCC construct (concurrent validity). It is appropriate to study the creative climate alongside the CCO, as it reflects the cultural conditions and attributes that facilitate or hinder employee creativity (Sundgren et al., 2005). To this end, we adopted a four-item scale featuring seven-point Likert scales ($\alpha = 0.823$) adapted from Sundgren et al.'s (2005) scale, which is grounded in the Ekvall CC scale. We controlled for social desirability (SD) and team diversity (TD) factors. SD was assessed ($\alpha = 0.606$) using a two-item scale featuring seven-point Likert scales adapted from Hays et al.'s (1989) study (cited in Nagaraj et al., 2020). For measuring TD, we utilized two items from Wu et al.'s (2019) research, employing seven-point Likert scales ($\alpha = 0.581$).

Results

Preliminary analyses. Using SPSS 28 software, we checked the consistency and plausibility of the series of answers to the questions measured on interval scales by calculating central tendency measurement indicators and dispersion and by analyzing the correlation matrix (see Appendix D2).

Measurement models and concurrent validity. We performed first- and second-order CFAs using SPSS AMOS 28 software. The first-order CFA indicated that the goodness-of-fit indicators yielded satisfactory results based on standard criteria ($Chi^2/155 = 1.457$; RMSEA = 0.046; TLI = 0.967; CFI = 0.973; SRMR = 0.046; PCLOSE = 0.702). The measurement model was confirmed to be robust, as the Bollen–Stine bootstrap test with 500 samples showed that the model was correct ($p = 0.144$). As indicated in Table 6, the model supports both convergent (AVE for the five dimensions is > 0.500) and discriminant validity (AVE > MSV, and the square root of AVE is greater than the interfactor correlation), and CR (values > 0.780).

Table 6 Reliability and convergent and discriminant validity (First-order model)

	CR	AVE	MSV	1.	2.	3.	4.	5.	6.
1. Internal idea socialization routines	0.864	0.680	0.463	**0.825**					
2. Idea management routines	0.873	0.696	0.572	0.578	**0.834**				
3. External openness routines	0.780	0.544	0.295	0.254	0.543	**0.738**			
4. Creative equipment routines	0.898	0.687	0.572	0.464	0.757	0.527	**0.829**		
5. Internal agility routines	0.883	0.716	0.367	0.387	0.593	0.368	0.606	**0.846**	
6. Creative climate	0.832	0.562	0.463	0.680	0.615	0.402	0.549	0.521	**0.750**

Fit indices: $Chi^2/155 = 1.457$; RMSEA = 0.046; TLI = 0.967; CFI = 0.973; SRMR = 0.046; PCLOSE = 0.702
N = 220; results validated by IBM SPSS AMOS 28 software.
[a] Square roots of AVE are noted in bold on the diagonal.
[b] Interfactor correlations are shown under the diagonal.

Second-order CFA also presents satisfactory goodness-of-fit indicators ($Chi^2/164 = 1.615$; RMSEA = 0.053; TLI = 0.955; CFI = 0.961; SRMR = 0.063; PCLOSE = 0.326). The Bollen–Stine bootstrap test with 500 samples showed that the second-order model was robust ($p = 0.062$). A parameter analysis indicated that each of the measurement variables was significantly related to the latent construct specified in the model (see Appendix E2). As shown in Table 7, CR indicators exceeded the required standard of 0.7 and convergent validity was established (with AVE above 0.500), as was discriminant validity (AVE > MSV, and the square root of AVE is greater than the interfactor correlation). To test the effect of CMB, we used the method with a marker variable, SD, as recommended by Podsakoff et al. (2003). This method involves comparing the Chi-square difference between an *unconstrained* model and an *equal constrained* model with SD as the marker variable. The results indicated invariance (Delta $Chi^2 = 29.100$; Delta $df = 19$; $p = 0.064$) between the two models, thus indicating a low likelihood of method bias influencing the model.

Table 7 Reliability and convergent and discriminant validity (Second-order model)

	CR	AVE	MSV	1.	2.
1. OCCs	0.850	0.538	0.531	**0.733**	
2. Creative climate	0.831	0.561	0.531	0.729	**0.749**

Fit indices: $Chi^2/164 = 1.615$; RMSEA = 0.053; TLI = 0.955; CFI = 0.961; SRMR = 0.063; PCLOSE = 0.326
N = 220; results validated by IBM SPSS AMOS 28 software.
[a] Square roots of AVE are noted in bold on the diagonal.
[b] Interfactor correlations are shown under the diagonal.

Formative versus reflective. As stated above, a higher-order construct can be conceptualized as a formative index or as a reflective higher-order latent factor. In our research model, we conceived the OCC construct as a reflective second-order construct manifested in its five dimensions (internal idea socialization routines, creative equipment routines, idea management routines, external openness routines, and internal agility routines), as confirmed by the fact that interfactor correlations are moderate (see Appendices G1, G2, G3, and G4). To test our conceptualization statistically, we compared the two second-order models—reflective (Type I) and formative (Type II)—and used the Akaike information criterion (AIC) to determine which model best fits the dataset (Akaike, 1987). The model to be retained is the one with the lowest AIC value, as the lowest values indicate a better trade-off between model fit and complexity (Akaike, 1987). To test the Type II model and compare it with the Type I model, we used the solution recommended by Jarvis et al. (2003) to link the latent construct (OCCs) to theoretically appropriate reflective indicators. Creation of these four indicators (α = 0.903) referred to Dampérat et al.'s (2016) scale adapted to the organizational level: *In general, you would say about your organization:* (1) *My organization has the ability to generate new ideas*; (2) *My organization has the ability to select the best ideas*; (3) *My organization has the ability to solve problems creatively*; (4) *My organization has the ability to use original ideas to get things done* (from 1 = Strongly disagree to 7 = Strongly agree). As shown in Table 8, the AIC value is lower for the second-order reflective model than for the second-order formative model, thus indicating that the Type I model is better than the Type II model.

Table 8 Comparison between reflective and formative second-order measurement models

	Formative second-order measurement model (Type II)	Reflective second-order measurement model (Type I)
Chi²	418.512	264.938
df	234	164
RMSEA	0.060	0.053
TLI	0.936	0.955
CFI	0.946	0.961
SRMR	0.058	0.063
PCLOSE	0.040	0.326
AIC	598.512	396.938

Structural model and predictive validity. Using SPSS AMOS 28 software, we tested the structural model. The goodness-of-fit indicators for the structural model showed satisfactory values ($Chi^2/220 = 1.482$; RMSEA = 0.047; TLI = 0.957; CFI = 0.963; SRMR = 0.064; PCLOSE = 0.674). Structural model parameters for the second-order model are presented in Table 9. As shown in Figure 2, we found that the OCCs have a statistically significant positive effect (β = 0.685; *p* = 0.000) on CO, which means that the OCC scale has predictive validity. CC has a statistically significant positive effect on OCCs (β = 0.632; *p* = 0.000), but the influence of CC is not significant (at the level of p-value < 0.050) on CO (β = 0.146; *p* = 0.072). TD has a statistically significant positive effect on OCCs (β = 0.177; *p* = 0.011). Finally, SD does not have a statistically significant effect (at the level of p-value < 0.050) on CO (β = 0.076; *p* = 0.085). The percentage of variance of CO explained by its predictors is 65.200%.

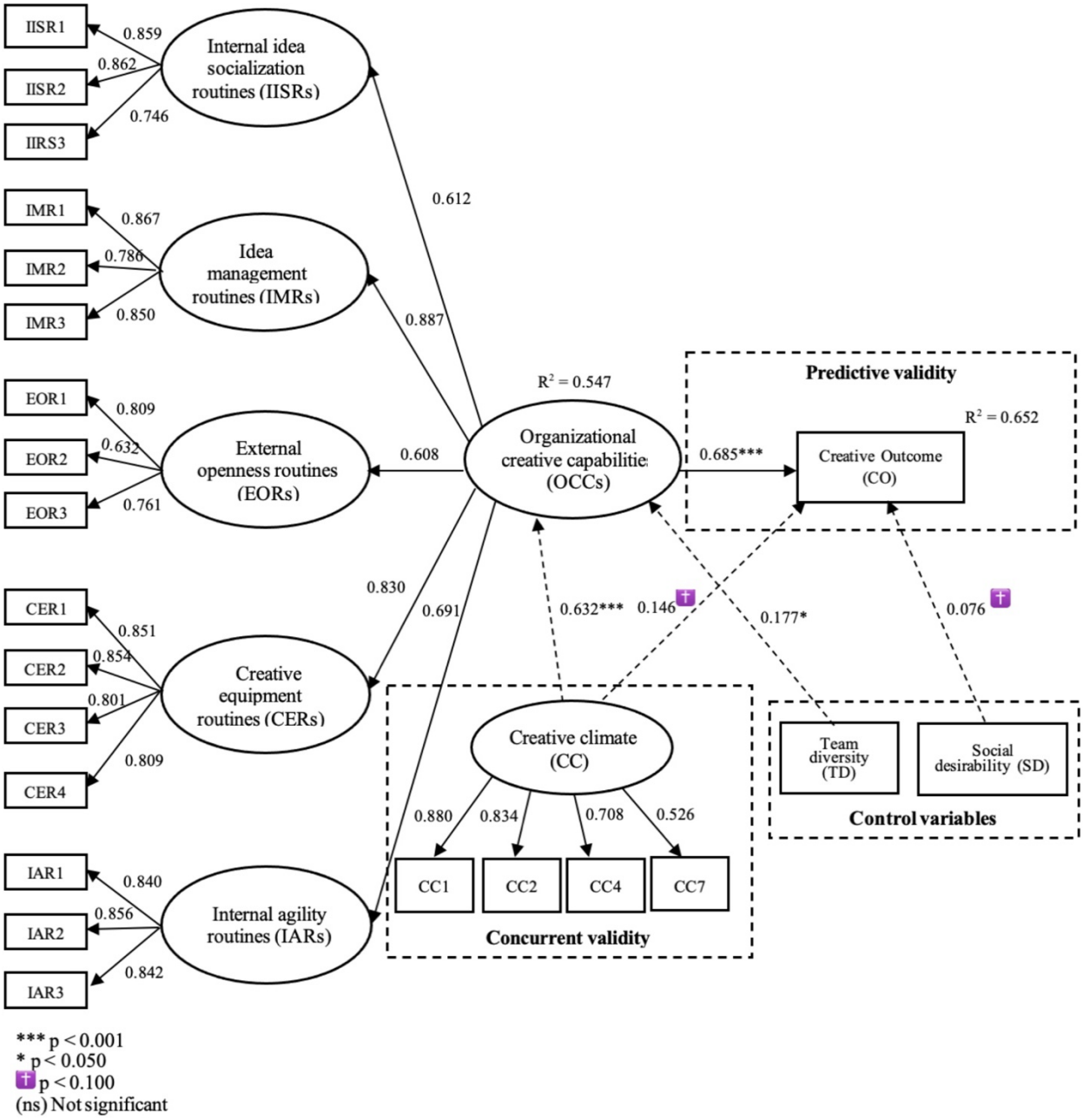
To complete the analysis of predictive validity externally from the respondents, the authors extracted from the database a sample of 39 companies in the video game and software sectors for which the respondents had provided their organizations' names. The objective was to evaluate the CO of these organizations using readily available online data.[13] To facilitate a meaningful post hoc comparison of these "externally assessed" COs, we needed to concentrate on similar industry sectors, as the criteria for creativity vary significantly from one industry to another. We chose the video game and software sectors because the first author and a researcher from outside the study who carried out the evaluation separately have good knowledge of these sectors. The evaluation was based on two items: *How would you rate the degree of novelty of the organization's products?* (from 1 = Not at all new to 7 = Very new); *How innovative do you think the organization's products are in relation to the sector?* (from 1 = Not at all innovative to 7 = Very innovative). We created two indices between the two judges and calculated the average of these two indices to obtain our final CO index. We also calculated an OCC index. Finally, we performed a regression analysis using SPSS 28 software with the OCC index as the independent variable and the CO index as the dependent variable. The results show that OCCs have a significant and positive influence on the CO index (β = 0.331; *p* = 0.039), thus confirming the predictive validity of the OCC scale on CO on this limited sample.

Competitive model testing. We specified and tested a competitive model that considered the OCC scale as a first-order concept. First- and second-order models can be compared, as the first order is nested within the second model (Brown, 2006). Table 9 shows the results for the selected model and the competitive model. The results of the model comparison showed that the AIC value is lower for the second-order structural model than for the first-order structural model. The results show that the fit indices are significantly improved with the second-order model (Delta $Chi^2 = 70.352$; Delta *df* = 7; *p* = 0.000).

Table 9 Results for the test of model comparison between first- and second-order models

			Second-order model				First-order model			
			Stand. par.	**S.E.**	***t*-test**	***p*-value**	**Stand. par.**	**S.E.**	***t*-test**	***p*-value**
OCC dimensions										
OCCs	→	IISR	0.612	–	–	–	–	–	–	–
OCCs	→	IMR	0.887	0.271	7.938	*0.000*	–	–	–	–
OCCs	→	EOR	0.608	0.199	6.096	*0.000*	–	–	–	–
OCCs	→	CER	0.830	0.305	7.670	*0.000*	–	–	–	–
OCCs	→	IAR	0.691	0.213	6.887	*0.000*	–	–	–	–
Predictive validity										
OCCs	→	CO	0.685	0.244	6.229	*0.000*	–	–	–	–
IISR	→	CO	–	–	–	–	-0.120	0.101	-1.584	*0.113*
IMR	→	CO	–	–	–	–	0.241	0.073	3.033	*0.002*
EOR	→	CO	–	–	–	–	0.190	0.067	3.147	*0.002*
CER	→	CO	–	–	–	–	0.160	0.053	2.341	*0.019*
IAR	→	CO	–	–	–	–	0.096	0.065	1.520	*0.129*
Concurrent validity										
CC	→	OCCs	0.632	0.053	6.238	*0.000*	–	–	–	–
CC	→	IISR	–	–	–	–	0.711	0.076	8.356	*0.000*
CC	→	IMR	–	–	–	–	0.707	0.109	8.425	*0.000*
CC	→	EOR	–	–	–	–	0.467	0.103	4.894	*0.000*
CC	→	CER	–	–	–	–	0.641	0.129	7.631	*0.000*
CC	→	IAR					0.570	0.100	6.579	*0.000*
CC	→	CO	0.146	0.094	1.802	*0.072*	–	–	–	–
Covariates			–	–	–	–				
TD	→	OCCs	0.177	0.046	2.555	*0.011*	–	–	–	–
TD	→	IISR	–	–	–	–	-0.009	0.078	-0.130	*0.897*
TD	→	IMR	–	–	–	–	0.044	0.110	0.637	*0.524*
TD	→	EOR	–	–	–	–	0.038	0.113	0.442	*0.658*
TD	→	CER	–	–	–	–	0.049	0.135	0.680	*0.497*
TD	→	IAR	–	–	–	–	0.065	0.106	0.864	*0.388*
SD	→	CO	0.076	0.040	1.721	*0.085*				
Goodness-of-fit measures										
Chi^2/df			326.076 / *220* (1.482)				396.428 / *213* (1.861)			
RMSEA			0.047				0.063			
TLI			0.957				0.924			
CFI			0.963				0.936			
SRMR			0.064				0.085			
PCLOSE			0.674				0.016			
AIC			484.076				568.428			

Figure 2 Multidimensional structural model to test predictive validity



Follow-up study (Study 4b). We collected a total of 379 responses, of which 205 were deemed complete, between July and August 2023. Appendix B presents the sample characteristics. To generalize our previous findings, we focused in this study on responses from industries other than specifically "creative" industries (as defined in Section 3.2). Appendix C provides an overview of the items administered. We used a 16-item scale to evaluate the OCC concept, which was derived from earlier stages of scale development. To assess predictive validity, we used a four-item scale featuring seven-point Likert scales (α = 0.873) adapted from Stock et al. (2014) to quantify the CO, and we considered it as a latent variable in this study. We controlled for *attitude to the color blue* (BLUE), recognized as an "ideal marker variable" by Miler and Simmering (2023, p. 409), using a seven-item scale featuring seven-point Likert scales (0.944), as described by the authors. We also controlled for *competitive intensity*, using four items from Stock et al.'s (2014) research, using seven-point Likert scales (α = 0.869). Measures of central tendency and the correlation matrix are presented in Appendix D3. Our evaluation-of-fit indicators revealed favorable results meeting established standards for both the first- (Chi^2/155 = 1.399; RMSEA = 0.044; TLI = 0.970; CFI = 0.976; SRMR = 0.046; PCLOSE = 0.749) and second-order (Chi^2/164 = 1.465; RMSEA = 0.048; TLI = 0.966; CFI = 0.970; SRMR = 0.054; PCLOSE = 0.601)

models. The Bollen–Stine bootstrap with 500 samples test yielded a nonsignificant result (p = 0.132). The model parameters show the significant relationships between each measurement variable and the latent construct specified within our model (Appendix E3). Reliability, convergent validity, and discriminant validity were satisfied for both first-order (see Table 10) and second-order (see Table 11) models. The results of the CMB test with the marker variable attitude to the color blue indicate invariance (Delta Chi^2 = 23.100; Delta *df* = 19; p = 0.233) between the *unconstrained* and *constrained* models, thus suggesting that the probability of method bias affecting the model is low.

TABLE 10 Reliability and convergent and discriminant validity (first-order model)

	CR	AVE	MSV	1.	2.	3.	4.	5.	6.
1. Internal idea socialization routines	0.794	0.563	0.280	**0.750**					
2. Idea management routines	0.864	0.680	0.645	0.473	**0.824**				
3. External openness routines	0.877	0.647	0.645	0.442	0.803	**0.804**			
4. Creative equipment routines	0.893	0.736	0.558	0.529	0.747	0.724	**0.858**		
5. Internal agility routines	0.848	0.650	0.604	0.380	0.667	0.777	0.611	**0.806**	
6. Creative outcome	0.873	0.631	0.425	0.363	0.613	0.652	0.611	0.422	**0.795**

Fit indices: $Chi^2/155$ = 1.399; RMSEA = 0.044; TLI = 0.970; CFI = 0.976; SRMR = 0.046; PCLOSE = 0.749
N = 205; results validated by IBM SPSS AMOS 28 software.
[a] Square roots of AVE are noted in bold on the diagonal.
[b] Interfactor correlations are shown under the diagonal.

TABLE 11 Reliability and convergent and discriminant validity (second-order model)

	CR	AVE	MSV	1.	2.
1. OCCs	0.895	0.637	0.475	**0.798**	
2. Creative outcome	0.873	0.632	0.475	0.689	**0.795**

Fit indices: $Chi^2/164$ = 1.465; RMSEA = 0.048; TLI = 0.966; CFI = 0.970; SRMR = 0.054; PCLOSE = 0.601
N = 205; results validated by IBM SPSS AMOS 28 software.
[a] Square roots of AVE are noted in bold on the diagonal.
[b] Interfactor correlations are shown under the diagonal.

The goodness-of-fit indicators for the structural model also showed satisfactory values ($Chi^2/201$ = 1.474; RMSEA = 0.048; TLI = 0.959; CFI = 0.964; SRMR = 0.053; PCLOSE = 0.590). Structural model parameters for the second-order model are presented in Appendix F. We found that the OCCs have a statistically significant positive effect (β = 0.647; p = 0.000) on CO, thus confirming the predictive validity of the OCC scale.

DISCUSSION

Despite the many published works on organizational creativity, few studies have explored the routines and devices that enable an organization to develop its creative capabilities. Our study addresses this gap by providing a theoretical framework for highlighting the different dimensions of OCCs, and by operationalizing this concept through the development and validation of a measurement scale. Through an extensive review of the literature, we conceptualized OCCs around five dimensions that correspond to five organizational routines: internal socialization routines, idea management routines, external openness routines, creative equipment routines, and internal agility routines. Based on this conceptualization and our five studies, comprising qualitative insights from interviews with managers, a study involving senior researchers in the field of innovation management, and four quantitative studies from relevant populations, our research confirms the scale's good psychometric qualities, thus ensuring that researchers applying any future academic research design using the scale can be confident in its reliability. We also validated the OCC scale's predictive validity by verifying that the five-dimensional, reflective scale with 16 indicators has a significant positive effect on the CO. We discuss below the theoretical and managerial contributions of this research and suggest opportunities for future research.

Theoretical contributions

Our research makes five significant contributions to the field of organizational creativity. Firstly, we advance the conceptualization of organizational creativity by viewing it as a capability embedded in routines supported by organizational processes and devices. This perspective diverges from prior organizational creativity research (Amabile, 1996; Woodman et al., 1993; Shalley et al., 2004), which predominantly focused on the relationships between group and individual characteristics or the broader organizational context and climate. Our capabilities-based approach to creativity offers a more nuanced understanding of how decision-makers can either nurture or hinder organizational creativity by modifying specific sets of organizational routines. Furthermore, adopting this approach also makes it possible to enrich the discourse around the delicate balance between stability and change within the realm of creative phenomena (Fortwengel et al., 2017) by showing how sets of routines, which guarantee a certain organizational stability, can drive behaviors and actions that function as sources of organizational change.

Second, we developed a reflective second-order model to measure OCCs. The model's reflective nature is aligned with our theoretical conceptualization of OCCs based on organizational routines. Such routines are the result of a complex arrangement of patterns, processes, and devices implemented by the organization and individual or group capabilities. This means that OCCs, like all organizational capabilities, are embedded in and integrated into the organization's deep structure. The OCC dimensions therefore reflect a complex capacity that is difficult to grasp in its entirety. The OCC scale makes it possible to reduce and measure this complexity, even though each organization has its own systems, processes, and devices.

Third, our results tend to show that two dimensions are particularly important (with the highest coefficients linking the OCCs to their dimensions), namely idea management and creative equipment routines. This finding confirms that ideas are the fuel of creativity and that it is therefore essential not only to equip individuals with tools that enable them to generate ideas of value to the organization but also to manage them to harvest, socialize, evaluate, and eventually store original ideas. These findings are in line with the growing interest in organizational creativity studies focused on idea management (Perry-Smith & Mannucci, 2017; Gerlach & Brem, 2017; Di Vincenzo et al., 2020) and creative equipment (Valgeirsdottir & Onarheim, 2017; Boutillier et al., 2020; Rampa & Agogué, 2021).

Fourth, our research provides a better understanding of the role played by CC on organizational creativity. Indeed, in addition to showing that the OCC scale addresses distinct constructs from CC scales (Amabile et al., 1996; Ekvall, 1996; Sundgren et al., 2005), our results demonstrate that the CC affects COs via its effect on OCCs. In this way, it seems that the CC serves as an antecedent to OCCs, although further research is needed to assess this aspect. OCCs may thus thrive in a creativity-nurturing climate, and they have much less impact on COs in a work environment which is less conducive to creativity. In terms of our approach to CC, it may be interesting to explore the ability to discriminate between OCC and innovation capabilities in future research

efforts. Although theoretical reasoning suggests the presence of a conceptual distinction between these two concepts, it is imperative to stress that empirical research based on a meticulous and rigorous protocol remains essential to definitively establish and validate the differences and potential relationships between the two concepts.

Finally, we provide researchers with a robust practical instrument for conducting empirical research on organizational creativity. This scale can be mobilized by researchers seeking to understand the evolution of organizations' creative capacities longitudinally, and it provides them with a new tool for examining the effect on organizational creativity of a change in routines or the introduction of new devices. The scale will also enable researchers to test new hypotheses on the relationship between sudden changes in the environment and organizational creativity, innovation, performance, and resilience.

Managerial contributions

This research also offers valuable insights for practitioners. Primarily, our scale serves as a diagnostic tool for managers and organizational leaders which can empower them to evaluate and strengthen their organizations' creative capabilities. By pinpointing the specific dimensions where an organization excels or falls short, the scale facilitates the identification of tailored strategies for nurturing creative behaviors and actions. For example, if an organization scores rather low on external openness routines, it might try to improve or diversify its channels with external actors (West & Bogers, 2014), or it may encourage employee involvement in external events or communities (Cohendet & Simon, 2016). Moreover, the scale can be deployed to gauge the outcomes of initiatives designed to enhance OCCs. Managers can use periodic assessments to ensure that their interventions yield the desired impact in alignment with their initial objectives.

Perhaps the most pivotal managerial takeaway from our research lies in recognizing the tangible and pivotal influence of different sets of routines and devices established for the creative behaviors and actions of individuals and teams. Beyond the recruitment of specialized talent, leadership styles, and team diversity, our findings underscore the significance of managerial intervention at all organizational levels. In so doing, our research is aimed at showing decision-makers the direct influence they can have on organizational creativity when they deploy new processes, introduce new methods, produce new rules and standards, or design systems that will create new consistent patterns of action in their organization.

Limitations and future research

We recognize that our research has some limitations. While we provide evidence of our scale's predictive validity, further research would be needed to provide more detailed insights into the variables that may moderate OCCs' influence on COs. One such variable could be leadership style, given the importance of the leader's role in creating a work environment conducive to creativity (Hill et al., 2014; Napier & Nilsson, 2006).

In the same vein, organizational capabilities take time to develop, and many events and factors can block, slow, or prevent their development. Future research could therefore focus on investigating the contextual and organizational factors that support or block effective implementation of OCC routines, such as an organization's culture or financial capacity.

The OCC scale's predictive validity could be tested with other measurements of CO, for example, by using marketplace organization of ideas (Soukhoroukova, Spann, & Skiera, 2012).

Finally, as OCCs are just one of many organizational capability types, future researchers could look for any links between these capabilities, including absorptive capabilities and dynamic capabilities, and their roles in organizational performance.

Endnotes

1. Administrative Science Quarterly, Research Policy, Journal of Product Innovation Management, Journal of Business Venturing, Industrial & Corporate Change, Organization, Organization Science, Organization Studies, Academy of Management Review, Management Science, Academy of Management Journal, Journal of Management, Journal of Management Studies, Strategic Management Journal, Journal of Marketing, Journal of the Consumer Psychology, Journal of Marketing Research, Journal of the Academy of Marketing Science, Marketing Science, Journal of Applied Psychology, and Personnel Psychology

2. All the references in the systematic literature review can be found here: https://vu.fr/pEQl

3. This dimension emerged after conducting the interviews in Study 1a, and it was subsequently confirmed by the literature review. We introduce it here to facilitate overall coherence.

4. The I-CVI measures the agreement among experts regarding the relevance of individual items within a content domain.

5. The S-CVI PR assesses the proportion of items that achieve a certain level of agreement (usually rated as "3" or "4") across all experts for each dimension.

6. The S-CVI Ave calculates the average I-CVI across all items for each dimension. This index provides insight into the overall content validity for a dimension.

7. The S-CVI UA considers the agreement across all experts for each item, with the aim being unanimous agreement (usually rated as "3" or "4").

8. https://www.gov.uk/government/publications/dcms-sectors-economic-estimates-methodology/dcms-sector-economic-estimates-methodology#definitions

9. https://unctad.org/fr/node/27530

10. Guildford (1973) distinguishes five levels of correlations as: negligible (0 to 0.29), weak (0.3 to 0.49), moderate (0.5 to 0.69), strong (0.7 to 0.89), and very strong (0.9 to 1).

11. For all CFAs of the article, we used the Amos 28 plug-ins of Gaskin et al. (2023) to assess the validity and reliability of the OCC scale, and of Gaskin et al. (2022) to assess measures of model fit.

12. In Study 4a, CO is considered as an index in the structural model to test the predictive validity of the OCC, due to the discriminant validity issues with OCCs in the second-order model, but not in the first-order model.

13. Three types of information were systematically collected for each organization: (1) articles about their research activities; (2) innovative projects presented on their websites; and (3) articles about their products.

BIBLIOGRAPHY

Açıkgöz, Atif, and Ayşe Günsel. 2016. "Individual creativity and team climate in software development projects: The mediating role of team decision processes." *Creativity and Innovation Management* 25(4): 445-463.

Adler, Paul S., and David Obstfeld. 2007. "The role of affect in creative projects and exploratory search." *Industrial and Corporate Change* 16(1): 19-50.

Akaike, H. (1987). "Factor analysis and AIC" *Psychometrika* 52: 317-332

Amabile, Teresa M. 1997. "Motivating creativity in organizations: On doing what you love and loving what you do." *California Management Review* 40(1): 39-58.

Amabile, Teresa M., Sigal G. Barsade, Jennifer S. Mueller, and Barry M. Staw. 2005. "Affect and creativity at work." *Administrative Science Quarterly* 50(3): 367-403.

Amabile, Teresa M. 1996. *Creativity in context*. Boulder: Westview Press.

Amabile, Teresa M., Regina Conti, Heather Coon, Jeffrey Lazenby, and Michael Herron. 1996. "Assessing the work environment for creativity." *Academy of Management Journal* 39(5): 1154-1184.

Amabile, Teresa M., 1988. "A model of creativity and innovation in organizations." *Research in Organizational Behavior* 10: 123–167.

Anastasi Anne. 1988. *Psychological Testing***,** Macmillan.

Andriopoulos, Constantine. 2001. "Determinants of organisational creativity: a literature review." *Management Decision* 39(10): 834-841.

Bakker, Han, Kees Boersma, and Sytse Oreel. 2006. "Creativity (Ideas) Management in Industrial R&D Organizations: A Crea-Political Process Model and an Empirical Illustration of Corus RD&T." *Creativity and Innovation Management* 15(3): 296–309.

Bassett-Jones, Nigel. 2005. "The paradox of diversity management, creativity and innovation." *Creativity and Innovation Management* 14(2): 169-175.

Becker, Markus. C. 2004. "Organizational routines: A review of the literature." *Industrial and Corporate Change* 13(4): 643-678.

Beretta, Michela. 2019. "Idea selection in web-enabled ideation systems." *Journal of Product Innovation Management* 36(1): 5-23.

Beretta, Michela, Jennie Björk, and Mats Magnusson. 2018. "Moderating ideation in web-enabled ideation systems." *Journal of Product Innovation Management* 35(3): 389-409.

Björk, Jennie, Paolo Boccardelli, and Mats Magnusson. 2010. "Ideation capabilities for continuous innovation." *Creativity and Innovation Management* 19(4): 385-396.

Björk, Jennie, and Mats Magnusson. 2009. "Where do good innovation ideas come from? Exploring the influence of network connectivity on innovation idea quality." *Journal of Product Innovation Management* 26(6): 662-670.

Boeddrich, Heinz-Juergen. 2004. "Ideas in the workplace: a new approach towards organizing the fuzzy front end of the innovation process." *Creativity and Innovation Management* 13(4): 274-285.

Bollen, Kenneth, and Richard Lennox. 1991. "Conventional wisdom on measurement: A structural equation perspective." *Psychological Bulletin* 110(2): 305-314

Boons, Mark, and Daan Stam. 2019. "Crowdsourcing for innovation: How related and unrelated perspectives interact to increase creative performance." *Research Policy* 48(7): 1758-1770.

Bouncken, Ricarda B., Muhammad Mahmood Aslam, and Yixin Qiu. 2021. "Coworking spaces: Understanding, using, and managing sociomateriality." *Business Horizons* 64(1): 119-130.

Boutillier, Sophie, Ignasi Capdevila, Laurent Dupont, and Laure Morel. 2020. "Collaborative spaces promoting creativity and innovation." *Journal of Innovation Economics Management* 31(1): 1-9.

Brown, T. A. 2006. *Confirmatory factor analysis for applied research*. The Guilford Press.

Catmull, Edwin. 2008. *How Pixar fosters collective creativity*. Harvard Business School Publishing.

Charbonnier-Voirin, A. 2011. "The development and partial testing of the psychometric properties of a measurement scale of organizational agility." *M@n@gement* 14(2): 119-156.

Chen, Ming-Huei, Yuan-Chieh Chang, and Shih-Chang Hung. 2008. "Social capital and creativity in R&D project teams." *R&D Management* 38(1): 21-34.

Chen, Bo, and Niek Althuizen. 2022. “The effects of exposure to others’ ideas and their ratings on online crowdsourcing platforms on the quantity and novelty of subsequently generated ideas.” J*ournal of Product Innovation Management* 39(5): 643–661.

Chiva, Ricardo, and Alegre, Joaquín. 2009. “Organizational learning capability and job satisfaction: An empirical assessment in the ceramic tile industry.” *British Journal of Management* 20(3): 323–340.

Chong, Eric, and Xiaofang Ma. 2010. “The influence of individual factors, supervision and work environment on creative self-efficacy.” *Creativity and Innovation Management* 19(3): 233-247.

Chua, Roy YJ, Michael W. Morris, and Paul Ingram. 2010. “Embeddedness and new idea discussion in professional networks: The mediating role of affect-based trust.” *The Journal of Creative Behavior* 44(2): 85-104.

Churchill Jr, Gilbert A. 1979. “A paradigm for developing better measures of marketing constructs.” *Journal of Marketing Research* 16(1): 64-73.

Cirella, S., 2016. “Organizational Variables for Developing Collective Creativity in Business: A Case from an Italian Fashion Design Company.” *Creativity and Innovation Management* 25(3): 331–343.

Cohen, Wesley M., Levinthal, Daniel A.1990. “Absorptive capacity: A new perspective on learning and innovation.” *Administrative Science Quarterly* 35(1); 128–152

Cohendet, Patrick S., and Laurent O. Simon. 2016. “Always playable: Recombining routines for creative efficiency at Ubisoft Montreal’s video game studio.” *Organization Science* 27(3): 614-632.

Dahlander, Linus, and Mats Magnusson. 2008. “How do firms make use of open source communities?” *Long Range Planning* 41(6): 629-649.

Dampérat, Maud., Florence Jeannot, Eline Jongmans and Alain Jolibert. 2016. “Team creativity: Creative self-efficacy, creative collective efficacy and their determinants.” *Recherche et Applications en Marketing* (English Edition) 31(3): 6-25.

Dampérat, Maud., Florence Jeannot, Eline Jongmans and Alain Jolibert. 2019. “Modeling a cocreative process: The contributions of design and management.” *Recherche et Applications en Marketing* (English Edition) 34(3): 111-137.

Danneels, Erwin. 2016. “Survey measures of first- and second-order competences.” *Strategic Management Journal* 37(10): 2174-2188.

Darvishmotevali, Mahlagha, Levent Altinay, and Mehmet Ali Köseoglu. 2020. “The link between environmental uncertainty, organizational agility, and organizational creativity in the hotel industry.” *International Journal of Hospitality Management* 87: 102-499.

Dean, Tereza, David A. Griffith, and Roger J. Calantone. 2016. “New product creativity: Understanding contract specificity in new product introductions.” *Journal of Marketing* 80(2): 39-58.

Deichmann, Dirck, Christine Moser, Julie M. Birkholz, Ading Nerghes, Peter Groenewegen, and Shenghui Wang. 2020. “Ideas with impact: How connectivity shapes idea diffusion.” *Research policy* 49(1): 103881.

Deichmann, Dirk, Thomas Gillier, and Marco Tonellato. 2021. “Getting on board with new ideas: An analysis of idea commitments on a crowdsourcing platform.” *Research Policy* 50(9): 104-320.

Di Vincenzo, Fausto, Daniele Mascia, Jennie Björk, and Mats Magnusson. 2020. “Attention to ideas! Exploring idea survival in internal crowdsourcing.” *European Journal of Innovation Management* 24(2): 213-234.

Doehne, Malte, and Katja Rost. 2021. “Long waves in the geography of innovation: The rise and decline of regional clusters of creativity over time.” *Research Policy* 50(9): 1-21

Dosi, G., Nelson, R. R., & Winter, S. G. (Eds.). (2000). *The nature and dynamics of organizational capabilities.* Oxford University Press.

Drazin, Robert, Mary Ann Glynn, and Robert K. Kazanjian. 1999. “Multilevel theorizing about creativity in organizations: A sensemaking perspective.” *Academy of Management Review* 24(2): 286-307.

Dul, Jan, and Canan Ceylan. 2014. “The impact of a creativity-supporting work environment on a firm's product innovation performance.” *Journal of Product Innovation Management* 31(6): 1254-1267.

Eisenberger, Robert, and Linda Shanock. 2003. “Rewards, intrinsic motivation, and creativity: A case study of conceptual and methodological isolation.” *Creativity Research Journal* 15 (2-3): 121-130.

Ekvall, Göran. 1996. “Organizational climate for creativity and innovation.” *European Journal of Work and Organizational Psychology* 5(1): 105-123.

Eling, K., Griffin, A., Langerak, F. 2016. “Consistency Matters in Formally Selecting Incremental and Radical New Product Ideas for Advancement.” *Journal of Product Innovation Management* 33(51): 20–33

Elerud-Tryde, Anne, and Sophie Hooge. 2014. “Beyond the generation of ideas: Virtual idea campaigns to spur creativity and innovation.” *Creativity and Innovation Management* 23(3): 290-302.

Elisondo, Romina Cecilia. 2021. “Creative Actions Scale: A Spanish scale of creativity in different domains.” *The Journal of Creative Behavior* 55(1): 215-227.

Faraj, Samer, and Yan Xiao. 2006. “Coordination in fast-response organizations.” *Management Science* 52(8): 1155-1169.

Fetrati, Mahdieh A., David Hansen, and Payman Akhavan. 2022. “How to manage creativity in organizations: Connecting the literature on organizational creativity through bibliometric research.” *Technovation* 115 (2022): 1-10

Fisher, Colin M., and Teresa Amabile. 2008. “Creativity, improvisation and organizations.” In *The Routledge Companion to Creativity*. 13-24. Routledge.

Flatten, Tessa C., Andreas Engelen, Shaker A. Zahra, and Malte Brettel. 2011. “A measure of absorptive capacity: Scale development and validation.” *European Management Journal* 29(2), pp.98-116.

Fortwengel, J., Schüßler, E., Sydow, J., 2017. “Studying Organizational Creativity as Process: Fluidity or Duality?: Organizational Creativity as Process.” *Creativity and Innovation Management* 26(1): 5–16.

Franco, Chiara, and Fabio Landini. 2022. “Organizational drivers of innovation: The role of workforce agility.” *Research Policy* 51(2): 1-17.

Froehlich, Julia K., Martin Hoegl, and Michael Gibbert. 2016. “Idea selection in suggestion systems: a thematic similarity perspective.” *R&D Management* 46(5): 887-899.

Gaskin, J., James, M., Lim, J, and Steed, J. (2022), “Model fit measures, AMOS Plugin”. Available at: *http://statwiki.gaskination.com/*

Gaskin, J., James, M., Lim, J, and Steed, J. (2023), “Master Validity Tool, AMOS Plugin”. Available at: *http://statwiki.gaskination.com/*

Gamber, Michael., Tobias Kruft, and Alexander Kock. 2022. “Which effort pays off? Analyzing ideators’ behavioral patterns on corporate ideation platforms.” *Journal of Product Innovation Management* 39(3): 419–444.

Gassmann, Oliver, and Berislav Gaso. 2004. “Insourcing creativity with listening posts in decentralized firms.” *Creativity and Innovation Management* 13(1): 3-14.

George, Jennifer M. 2007. “Creativity in organizations.” *Academy of Management Annals* 1(1): 439-477.

Gerlach, Sophia, and Alexander Brem. 2017. “Idea management revisited: A review of the literature and guide for implementation.” *International Journal of Innovation Studies* 1(2): 144-161.

Giustiniano, Lucia, Sara Lombard, and Vincenzo Cavaliere. 2016. “How knowledge collecting fosters organizational creativity.” *Management Decision* 54(6): 1464–1496.

Hargadon, Andrew B., and Beth A. Bechky. 2006. “When collections of creatives become creative collectives: A field study of problem solving at work.” *Organization Science* 17(4): 484-500.

Hargadon, Andrew B., and Robert I. Sutton. "Technology brokering and innovation in a product development firm" *Administrative Science Quarterly* 42, no.4 (1997): 716-749.

Harrison, Spencer H., and Elizabeth D. Rouse. 2015. “An inductive study of feedback interactions over the course of creative projects.” *Academy of Management Journal* 58(2): 375-404.

Harvey, Sarah, and Chia-Yu Kou. 2013. “Collective Engagement in Creative Tasks: The Role of Evaluation in the Creative Process in Groups.” *Administrative Science Quarterly* 58(3): 346–386

Hasan, Sharique, and Rembrand Koning. 2019. “Conversations and idea generation: Evidence from a field experiment.” *Research Policy* 48(9): 1-12.

Hemlin, Sven. 2009. “Creative knowledge environments: An interview study with group members and group leaders of university and industry R&D groups in biotechnology.” *Creativity and Innovation Management* 18(4): 278-285.

Hill, Linda A., Greg Brandeau, Emily Truelove, and Kent Lineback. 2014. *Collective genius: The art and practice of leading innovation*. Harvard Business Review Press.

Hirst, Gilles, Daan Van Knippenberg, and Jing Zhou. 2009. “A Cross-Level Perspective on Employee Creativity: Goal Orientation, Team Learning Behavior, and Individual Creativity.” *Academy of Management Journal* 52(2): 280–293.

Homfeldt, Felix, Alexandra Rese, and Franz Simon. 2019. “Suppliers versus start-ups: Where do better innovation ideas come from?” *Research Policy* 48(7): 1738–1757.

Hu, Li-tze, and Peter M. Bentler, 1998. “Fit Indices in Covariance Structure Modeling: Sensitivity to Underparameterized Model Misspecification”, *Psychological Methods* 3(4): 424 453.

Jarvis, Cheryl B., Scott B Mackenzie, and Phillip M. Podsakoff. 2003. “A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer”, *Research. Journal of Consumer Research* 30(2): 199-218.

Jerez-Gômez, P., José Céspedes-Lorente, and Ramôn Valle-Cabrera. 2005. “Organizational learning and compensation strategies: Evidence from the Spanish chemical industry.” *Human Resource Management* 44(3): 279–299.

Kim, Yeun, J., Kim, Junha. 2020. “Does Negative Feedback Benefit (or Harm) Recipient Creativity? The Role of the Direction of Feedback Flow.” Aca*demy of Management Journal* 63(2): 584–612

Koh, Dohyoung, Kyootai Lee, and Kailash Joshi. 2019. “Transformational leadership and creativity: A meta-analytic review and identification of an integrated model.” *Journal of Organizational Behavior* 40(6): 625-650.

Kristensson, Per, Peter R. Magnusson, and Jonas Matthing. 2002. “Users as a hidden resource for creativity: Findings from an experimental study on user involvement.” *Creativity and Innovation Management* 11(1): 55-61.

Langner, B., Seidel, V.P., 2015. “Sustaining the Flow of External Ideas: The Role of Dual Social Identity across Communities and Organizations.” *Journal of Product Innovation Management* 32(4): 522–538.

Lawson, Benn., and Danny Samson. 2001. “Developing innovation capability in organisations: A Dynamic capabilities approach.” *International Journal of Innovation Management* 5(3): 377–400.

Lindkvist, Lars., Marie, Bengtsson, Dan-Magnus Svensson, and Linnéa Wahlstedt. 2017. “Replacing old routines: how Ericsson software developers and managers learned to become agile.” *Industrial & Corporate Change* 26(4): 571-591.

MacLean, Donald, Robert MacIntosh, and David Seidl. 2015. “Rethinking dynamic capabilities from a creative action perspective.” *Strategic Organization* 13(4): 340-352.

Magadley, Wissam, and Kamal Birdi. 2009. “Innovation labs: an examination into the use of physical spaces to enhance organizational creativity.” *Creativity and Innovation Management* 18(4): 315-325.

Mendoza-Silva, Andrea. 2021. “Innovation capability: A systematic literature review.” *European Journal of Innovation Management* 24(3): 707–734.

Miles, Matthew B., and Michael A. Huberman. 1994. *Qualitative data analysis: an expanded sourcebook*. Sage Publications.

Miller, B. K., and Marcia J. Simmering. 2023. “Attitude toward the color blue: An ideal marker variable.” *Organizational Research Methods*, 26(3): 409-440.

Nagaraj, Varun, Berente, Nicholas, Lyytinen, Kalle, and Gaskin, James. 2020. “Team design thinking, product innovativeness, and the moderating role of problem unfamiliarity.” *Journal of Product Innovation Management*, 37(4): 297–323.

Napier, Nancy K., and Mikael Nilsson. 2006. “The development of creative capabilities in and out of creative organizations: Three case studies.” *Creativity and Innovation Management* 15(3): 268-278.

Nouri, Rikki, Miriam Erez, Cynthia Lee, Jian Liang, Brendan D. Bannister, and Warren Chiu. 2015. “Social context: Key to understanding culture's effects on creativity.” *Journal of Organizational Behavior* 36 (7): 899-918.

Nunnally, Jum C. *Psychometric theory*. McGraw-Hill (1978).

Nunnally, Jum C., and Ira Bernstein. 1994. *Psychometric Theory* (Third Edition). McGraw-Hill.

Obstfeld, David. 2012. “Creative projects: A less routine approach toward getting new things done.” *Organization Science* 23(6), pp.1571-1592.

Ortmann, Günther, and Jörg Sydow. 2018. “Dancing in chains: Creative practices in/of organizations.” *Organization Studies*, 39(7): 899–921.

Ozer, Muammer, and Guangxi Zhang. 2022. “Interpersonal relationships and creativity at work: A network building perspective.” *Journal of Product Innovation Management* 39(3): 312-333.

Parmentier, Guy, and Vincent Mangematin. 2014. “Orchestrating innovation with user communities in the creative industries.” *Technological Forecasting and Social Change* 83: 40-53.

Pérez López, Susana, José Manuel Montes Peón, and Camilo José Vázquez Ordás. 2004. “Managing knowledge: the link between culture and organizational learning.” *Journal of Knowledge Management* 8(6): 93-104.

Perry-Smith, Jill E., and Pier Vittorio Mannucci. 2017. “From creativity to innovation: The social network drivers of the four phases of the idea journey.” *Academy of Management Review* 42(1): 53-79.

Podsakoff, Phillip. M., Scott. B. Mackenzie, Jeong-Yeon Lee, and Nathan. P. Podsakoff. 2003. “Common method biases in behavioral research: A critical review of the literature and recommended remedies.” *Journal of Applied Psychology* 88(5): 879-903.

Prabhu, Veena, Charlotte Sutton, and William Sauser. 2008. “Creativity and certain personality traits: Understanding the mediating effect of intrinsic motivation.” *Creativity Research Journal* 20(1): 53-66.

Rampa, Romain, and Marine Agogué. 2021. “Developing radical innovation capabilities: Exploring the effects of training employees for creativity and innovation.” *Creativity and Innovation Management* 30(1): 211-227.

Rangus, Kaja, Mateja Drnovšek, and Alberto Di Minin. 2016. “Proclivity for open innovation: Construct development and empirical validation.” *Innovation* 18(2): 191-211.

Reiter-Palmon, Roni, and Jody J. Illies. 2004. “Leadership and creativity: Understanding leadership from a creative problem-solving perspective.” *The Leadership Quarterly* 15(1): 55-77.

Ribeiro, Neuza, Ana Patrícia Duarte, Rita Filipe, and Rui Torres de Oliveira. 2020. “How authentic leadership promotes individual creativity: The mediating role of affective commitment.” *Journal of Leadership & Organizational Studies* 27(2): 189-202.

Richter, Andreas W., Giles Hirst, Daan Van Knippenberg, and Markus Baer. 2012. “Creative self-efficacy and individual creativity in team contexts: cross-level interactions with team informational resources.” *Journal of Applied Psychology* 97(6): 1282.

Richter, Nancy, Paul Jackson, and Thomas Schildhauer. 2018. “Outsourcing creativity: An abductive study of open innovation using corporate accelerators.” *Creativity and Innovation Management* 27(1): 69-78.

Rossiter, John R. 2008. “Content validity of measures of abstract constructs in management and organizational research.” *British Journal of Management* 19(4): 380-388.

Salter, Ammon, Anne L. J. Ter Wal, Paola Criscuolo, and Oliver Alexy. 2015. “Open for ideation: Individual-level openness and idea generation in R&D.” *Journal of Product Innovation Management* 32(4): 488-504.

Schilke, Oliver, Songcui Hu, and Constance E. Helfat. 2018. “Quo vadis, dynamic capabilities? A content-analytic review of the current state of knowledge and recommendations for future research.” *Academy of Management Annals* 12(1): 390-439.

Seidel, Victor P., and Sebastian K. Fixson. 2013. “Adopting design thinking in novice multidisciplinary teams: The application and limits of design methods and reflexive practices.” *Journal of Product Innovation Management* 30(1): 19-33.

Shalley, Christina E., Jing Zhou, and Greg R. Oldham. 2004. “The effects of personal and contextual characteristics on creativity: Where should we go from here?” *Journal of Management* 30(6): 933-958.

Shalley, Christina E., and Jill E. Perry-Smith. 2008. “The emergence of team creative cognition: The role of diverse outside ties, sociocognitive network centrality, and team evolution.” *Strategic Entrepreneurship Journal* 2(1): 23-41.

Silvia, Paul J., Benjamin Wigert, Roni Reiter-Palmon, and James C. Kaufman. 2012. “Assessing creativity with self-report scales: A review and empirical evaluation.” *Psychology of Aesthetics, Creativity, and the Arts* 6(1): 19-34.

Škare, Marinko, and Domingo Riberio Soriano. 2021. “A dynamic panel study on digitalization and firm's agility: What drives agility in advanced economies 2009–2018.” *Technological Forecasting and Social Change* 163: 120418.

Slavich, Barbara, and Silviya Svejenova. 2016. “Managing creativity: A critical examination, synthesis, and new frontiers.” *European Management Review* 13(4): 237-250.

Sonenshein, Scott. 2016. “Routines and creativity: From dualism to duality.” *Organization Science* 27(3): 739-758.

Sosa, Manuel E. 2011. “Where do creative interactions come from? The role of tie content and social networks.” *Organization Science* 22(1): 1-21.

Soukhoroukova, Arina, Martin Spann, and Bernd Skiera. 2012. “Sourcing, filtering, and evaluating new product ideas: An empirical exploration of the performance of idea markets.” *Journal of Product Innovation Management* 29(1): 100-112.

Stańczyk-Hugiet, Ewa, Katarzyna Piórkowska, and Sylwia Stańczyk. 2017. “Demystifying emergence of organizational routines.” *Journal of Organizational Change Management* 30(4): 525-547.

Stock, Maria, Florian Totzauer A., and Nicholas A. Zacharias. 2014. “A closer look at cross-functional R&D cooperation for innovativeness: Innovation-oriented leadership and human resource practices as driving forces.” *Journal of Product Innovation Management* 31(5): 924-938.

Styvén, Maria Ek, Anna Näppä, Marcello Mariani, and Rajan Nataraajan. 2022. “Employee perceptions of employers’ creativity and innovation: Implications for employer attractiveness and branding in tourism and hospitality.” *Journal of Business Research* 141: 290-298.

Sukhov, Alexandre., Antti Sihvonen, Johan Netz, Peter Magnusson, Lars E. Olsson. 2021. “How experts screen ideas: The complex interplay of intuition, analysis and sensemaking.” *Journal of Product Innovation Management* 38(2): 248–270.

Sundgren, Mats, Elof Dimenäs, Jan-Eric Gustafson, and Marcus Selart. 2005. “Drivers of organizational creativity: a path model of creative climate in pharmaceutical R&D.” *R&D Management* 35(4): 359-374.

Tang, Chaoying. 2016. “Accessed external knowledge, centrality of intra-team knowledge networks, and R & D employee creativity.” *R&D Management* 46(53): 992-1005.

Teece, David J. 2007. “Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance*.” Strategic Management Journal* 28(13): 1319-1350.

Teece, David J. 2014. “The foundations of enterprise performance: Dynamic and ordinary capabilities in an (economic) theory of firms.” *Academy of Management Perspectives* 28(4): 328-352.

Teece, David J. 2018. “Business models and dynamic capabilities." *Long Range Planning* 51(1): 40-49.

Todorova, Gergana, and Durisin, Boris. 2007. “Absorptive Capacity: Valuing a reconceptualization.” *Academy of Management Review* 32(3): 774–786.

Valgeirsdottir, Dagny, and Balder Onarheim. 2017. “Studying creativity training programs: A methodological analysis.” *Creativity and Innovation Management* 26(4): 430-439.

Van den Ende, Jan, Lars Frederiksen, and Andrea Prencipe. 2015. “The front end of innovation: Organizing search for ideas.” *Journal of Product Innovation Management* 32(4): 482-487.

Vanhaverbeke, Wim, Geert Duysters, and Niels Noorderhaven. 2002. “External technology sourcing through alliances or acquisitions: An analysis of the application-specific integrated circuits industry.” *Organization Science* 13(6): 714-733.

Vicente, Margarida, José Luís Abrantes, and Mário Sérgio Teixeira,. 2015. Measuring innovation capability in exporting firms: the INNOVSCALE.” *International Marketing Review* 32(1): 29–51.

Walsh, John P., You-Na Lee, and Sadao Nagaoka. 2016. “Openness and innovation in the US: Collaboration form, idea generation and implementation.” *Research Policy* 45(8): 1660–1671.

Wang, Catherine L., and Pervaiz K. Ahmed. 2004. “The development and validation of the organisational innovativeness construct using confirmatory factor analysis.” *European Journal of Innovation Management* 7(4): 303-313.

Wang, Ching–Wen, and Ruey–Yun Horng. 2002. “The effects of creative problem solving training on creativity, cognitive type and R&D performance.” *R&D Management* 32(1): 35-45.

Warner, Karl SR, and Maximilian Wäger. 2019. “Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal.” *Long Range Planning* 52(3): 326-349.

West, Joel, and Marcel Bogers. 2014. “Leveraging external sources of innovation: a review of research on open innovation.” *Journal of Product Innovation Management* 31(4): 814-831.

Winter, Sidney G., 2003. “Understanding dynamic capabilities.” *Strategic Management Journal* 24(10): 991-995.

Woodman, Richard W., John E. Sawyer, and Ricky W. Griffin. 1993. “Toward a theory of organizational creativity.” *Academy of Management Review* 18(2): 293-321.

Wu, Guangdong, Xianbo Zhao, Jian Zuo, and George Zillante. 2019. “Effects of team diversity on project performance in construction projects.” *Engineering, Construction and Architectural Management* 26(3): 408-423

Zahra, Shaker A., George, Gerard. 2002. “Absorptive Capacity: A review, reconceptualization, and extension.” *Academy of Management Review* 27(2): 185–203.

Zhou, Jing, and Christina E. Shalley. 2003. “Research on employee creativity: A critical review and directions for future research.” *Research in personnel and human resources management* 22: 165-217.

Zhu, Hangzi, Alexander Kock, Marc Wentker, and Jens Leker. 2019. “How does online interaction affect idea quality? The effect of feedback in firm-internal idea competitions.” *Journal of Product Innovation Management* 36(1): 24-40.

Zutshi, Ambika, John Mendy, Gagan Deep Sharma, Asha Thomas, and Tapan Sarker. 2021. “From challenges to creativity: enhancing SMEs’ resilience in the context of COVID-19.” *Sustainability* 13(12): 6542.

Appendix A1 List of completed interviews (Study 1a)

Industry	Organization size (Number of employees)	Interviewee's function
Video Games	10,000	Diversity and Inclusion Project Manager (J1)
	10,000	General Delegate of software publishers' union / Vice-President of a video game studio (J2)
	-	General Director of the French Video Game Agency (AFJV) (J3)
	-	General Director of the Video Game Union (SFJV) (J4)
	23-100	Director and Studio owner (J5)
	4-10	Director and Studio owner (J6)
	-	University Professor and video-game expert (J7)
	-	Video Game Development Consultant (J8)
Animation cinema	1,200-5,000	Digital Animation Director (C1)
	190,000-200,000	Art Director (C2)
	-	Artistic Director of animation festival (C3)
	200-250	Animation supervisor (C4)
	100-200	Director and Producer (C5)
	40-80	Distribution Manager (C6)
	20-30	Director and Studio owner (C7)
Architecture	30-35	Owner and Director of an architecture agency (A1)
	40-50	Owner and Director of an architecture agency (A2)
	10-15	Owner and Director of an architecture agency (A3)
	10-15	Owner and Director of an architecture agency (A4)
	-	Professor of Architecture and Expert(A5)
Fashion and cosmetics	25 000	Director of Innovative Transformation Projects (F1)
	25 000	Director of Strategic Partnerships and Startups (F2)
	-	Fashion Office Commissioner (F3)
	-	President of a seasonal fashion event (F4)

Appendix A2 Examples of verbatims for OCC routines (Study 1a)

Dimensions	Number (%)	Verbatims (excerpts)
Internal Idea Socialization Routines	35 (17%)	*With an open atmosphere, team members can freely share their thoughts and inspirations and come up with new ideas* (J3). *In open spaces, animation professionals have the freedom to move around and engage with each other. This actually stimulates their creativity, allowing for casual conversations and exchanges of new ideas* (C7). *When individuals come together to discuss their ideas formally, it fosters an environment where everyone feels empowered to contribute and explore new concepts* (J3). *We always share and discuss our ideas in meetings to find the best ideas and explore new architectural solutions* (A2). *In our office, we have whiteboards and pin-up boards where we can share sketches and develop each other's ideas* (C3). *Meetings can be a tool to encourage participation and foster an environment where the imagination can flourish* (C6). *We often have meetings in the office to discuss different topics and find new ideas* (A3). *The formal exchange of ideas helps us refine and improve our game concepts. Through constructive criticism and feedback, we can iterate on our ideas, polish them, and ultimately deliver a better experience for our players* (J5). *The exchange between collaborators during meetings allows for a multiple view of the projects* (A1). *Formal exchanges provide a structured platform for team members to share their ideas, collaborate, and ultimately create something unique* (J1).
Idea Management Routines	52 (25%)	*On the macro level for a new game idea, in fact the person who has a new idea has to make a pitch about it on Google doc, so yes, it is formalized* (J1). *When we feel that an idea is good, we put it on slack, so that it is stored* (J6). *Sometimes we use the digital modeling software to preserve our design for future reference* (A3). *I think such systems can help us prioritize and allocate resources to different projects, ensuring that our ideas are effectively managed* (A3). *We have this software that mainly help us to monitor the progress of each idea or project and establish clear timelines* (J5). *Actually we sometimes conduct milestone meetings to formalize and evaluate our ideas* (C4). *We fill out grids which contains many criteria such as: creativity, the marketing pile, knowing how to sell the game, the publisher pile, and then there is us, what we think, what we try to do?* (J8). *We have software for that, which has allowed us to improve collaboration within our studios... We can easily share and exchange ideas and provide feedback!* (C6). *Then when they present it to their director or innovation committee, they get feedback* (F1) *If someone has an idea, they post it on our idea management system and we react to it, give them feedback.* (J2) *When we feel that an idea is good we ask the person to put it on our idea system so that it is stored on a kind of crash tool which is quite simple* (J3).

External Openness Routines	40 (19 %)	*It can be about seeking the expertise of historians, architects, geographers, or sports specialists. However, the involvement of experts is only necessary if there is a clear need for it* (J7). *By collaborating with professionals from other fields, we can integrate technologies, materials, and construction methods, elevating the quality and performance of our designs* (A3). *Players are an integral part of the creative process. Through their feedback, suggestions, and user-generated content, they contribute to shaping the evolution of our games, making them more engaging and tailored to their preferences* (J4). *We analyze the successes and challenges faced by our competitors, so we can deliver architectural solutions that are relevant and distinctive* (A2). *We receive proposals from our suppliers in terms of innovation, we work with people who are particularly innovative and active, and we also push ideas from them, and for what comes from our teams and from the reflection that we have been able to carry out internally, we accompany them in the development of particular resources in Co-development* (A5). *We believe in the power of partnerships with external actors to expand our creative horizons. By teaming up with artists, musicians, or choreographers, we infuse our films with their unique talents, adding depth and artistic value to our animation projects* (C5). *Partners contribute their unique perspectives and resources to our animation projects. By teaming up with animation studios or technology companies, we can access technology and creative talent to enrich our films with new creative ideas* (C1). We work with people who are particularly innovative and active, and we also push ideas from them (F2). We attend film festivals and analyze audience feedback (C2).
Creative Equipment Routines	35 (17%)	*There are regular training modules on creativity, and we also have seminars that allow us to nourish this capacity to respond to needs within a framework* (C1). *With brainstorming sessions we can unlock the collective creativity of our teams (J3).* *We use various creative thinking methods to help people adopt new perspectives. We actually do a lot of brainstorming* (A1). *We encourage out-of-the-box thinking using many creative methods such as brainstorming* (C4). *We also have co-working spaces, we have a creativity space that we have created on the site where we meet to brainstorm, which is quite different from our classic way of working* (A2). *We have a creative space we've created on a website where we meet to brainstorm, which is quite different from our classic codes* (F2). *We have training programs that help individuals develop new skills and acquire new knowledge. Through these training programs, we have been able to approach challenges from new perspectives* (A4). *In particular, we do brainstorming, pre-design and co-creation, we work internally or with external partners, to feed and develop this idea generation aspect* (A5). *We organize workshops regularly that aim not only to create ideas, but also to allow individuals to engage in learning experiences* (A3).
Internal Agility Routines	47 (22%)	*For us, reacting quickly to change means essentially adapting to the changing needs of our customers* (A3). *The advantage is that we have developed games with small teams and quite quickly, that is to say during a year or a year and a half of development, and therefore if there are big changes on the market, we can adapt very quickly* (J6). *We add extra time to our production schedules. This extra time allows us to deal with any unexpected problems* (J8). *So we have been flexible and we are planning ahead for the future. We talked about this this morning, we said we have to know how to organize ourselves if we have a new confinement at the beginning of the new year to be able to continue working* (C2). *Rapidly responding to external changes in the gaming industry is essential for staying ahead of the curve. It empowers game developers to anticipate and address evolving player needs and incorporate emerging technologies* (J3). *If we found out that there are new visual styles on the market that improve the quality of the animation, we adopt them* (C4). *It can be made by engaging with the gaming community through online forums, social media platforms, and player surveys* (J2). *We incorporate player feedback into our design iterations to create video games that are innovative, relevant, and enjoyable* (J8). *We are constantly iterating and refining our designs so we can explore different ideas* (A2).

Appendix B Characteristics of the four samples

Sample characteristics		Study 2 (N=269)	Study 3 (N=214)	Study 4a (N=220)	Study 4b (N=205)
Gender[a]	Man	68.773%	76.635%	53.636%	53.658%
	Woman	31.226%	20.093%	45.000%	46.341%
	Non-binary	-	3.272%	1.364%	-
Age[b]	Mean (s.d.)	36.851 (11.131)	37.761 (12.423)	39.1 (11.1)	40.614 (12.307)
Function[c]	Director	21.561%	28.037%	28.636%	33.171%
	Manager	50.558%	39.252%	42.727%	50.244%
	General employee	23.420%	29.907%	25.000%	16.585%
	Not available	4.461%	2.804%	3.636%	-
Industry[d]	Creative industries	47.584%	40.187%	31.364%	5.366%
	Advertising	*8.550%*	*0.935%*	*10.000%*	1.463%
	Architecture	*9.665%*	*9.346%*	*2.273%*	0.488%
	Crafts, design, and various arts	*10.781%*	*8.411%*	*10.000%*	2.439%
	Media and publishing	*3.346%*	*3.738%*	*2.273%*	0.976%
	Vidéo games	*15.242%*	*17.757%*	*6.818%*	-
	Other industries	52.416%	59.813%	68.636%	94.634%
	Software sector	*20.446%*	*23.364%*	*20.455%*	*11.220%*
	Consulting, training, and finance	*10.409%*	*10.280%*	*10.909%*	*3.415%*
	Health, NGOs, and administration	*4.089%*	*8.879%*	*24.545%*	*20.488%*
	Various secondary and tertiary industries	*17.472%*	*17.290%*	*12.727%*	*59.512%*
Organization size (number of employees)[e]	1-3	4.833%	2.336%	1.818%	-
	4-9	6.691%	7.944%	6.818%	-
	10-19	11.152%	10.280%	4.545%	6.341%
	20-49	11.524%	9.813%	12.727%	10.244%
	50-99	11.524%	9.346%	10.909%	17.561%
	100-499	23.048%	16.822%	24.545%	23.902%
	500-999	4.833%	4.673%	21.818%	12.195%
	More than 1000	26.394%	38.785%	16.818%	29.756%
Geographic location[d]	France	73.977%	-	-	-
	Canada	26.022%	0.935%	6.818%	-
	USA	-	45.794%	46.818%	35.610%
	Europe	-	28.037%	39.545%	42.927%
	Eastern Asia	-	6.075%	-	-
	South America	-	0.467%	0.455%	0.976%
	Australia	-	5.140%	3.182%	-
	International Company	-	8.879%	3.182%	12.683%
	Multinational Company	-	4.673%	-	7.805%

[a] Nominal scale
[b] Numerical scale
[c] Open-ended question requiring post-coding a in Studiy3, Study 4 and Study 4a, and a nominal scale with an open-ended option in Study 4b
[d] Nominal scale with an open-ended option
[d] Ordinal scale

Appendix C Measures and items

Items in the administrated surveys are listed below, including items retained in the final research models, and also those that were dropped after the EFA (Study 2) and the three CFAs (Studies 3, 4a and 4b). *Dropped items are shown in italics.*

OCC DIMENSIONS		Sources (adapted from)
Internal Idea Socialization Routine (IISR)		
Regarding social relations in your organization, you would say: / 7-point Likert scale (1 = strongly disagree; 7 = strongly agree)		
IISR1	In my organization, it is easy to discuss our ideas with our colleagues.	Pérez López et al. (2004)
IISR2	In my organization, we regularly exchange information and ideas.	Interviews (Study 1a)
IISR3	In my organization, we encourage cooperation between employees.	Pérez López et al. (2004)
*IISR4**	*In my organization, we organize meetings to exchange new ideas.*	Hargadon and Bechky (2006)
*IISR5**	*In my organization, we often organize events to meet new people.*	Interviews (Study 1a)
*IISR6**	*In my organization, we have formal processes in place to share best practices between different business areas.*	Pérez López et al. (2004)
*IISR7**	*In my organization, internal meetings are a source of new ideas.*	Hargadon and Bechky (2006) / Björk and Magnusson (2009)
Idea Management Routine (IMR)		
Regarding idea management in your organization, you would say: / 7-point Likert scale (1 = strongly disagree; 7 = strongly agree)		
IMR1	In my organization, we formalize ideas to be able to share and evaluate them.	Gerlach and Brem (2017) / Gamber et al. (2022)
IMR2	In my organization, we retain good ideas that are not actioned so they can be used in other projects.	Gerlach and Brem (2017) / Cohendet and Simon (2016)
IMR3	In my organization, we allocate specific resources to develop the best ideas.	Gerlach and Brem (2017) / Bakker et al. (2006)
*IMR4***	*My organization uses an idea management system (idea box, idea files, or software).*	Gerlach et Brem (2017) / Beretta (2019)
*IMR5**	*There is a committee dedicated to evaluating ideas.*	Gerlach and Brem (2017)
*IMR6**	*There are criteria for measuring the quality of ideas.*	Gerlach and Brem (2017) / Boeddrich (2004)
*IMR7**	*Employees are free to propose ideas to their managers.*	Gerlach and Brem (2017) / Elerud-Tryde and Hooge (2014)
*IMR8**	*Employees receive feedback on the ideas they propose.*	Gerlach and Brem (2017) / Zhu et al. (2019)
*IMR9**	*Managers are receptive to ideas put forward by employees.*	Gerlach and Brem (2017)
*IMR10**	*Idea generators receive recognition.*	Gerlach and Brem (2017)
External Openness Routine (EOR)		
Regarding your organization's openness, you would say: / 7-point frequency scale (1 = never; 7 = always)		
EOR1	My organization draws inspiration from external stakeholders (customers, suppliers, or researchers) to come up with new ideas.	Rangus et al. (2016) / Salter et al. (2015)
EOR2	My organization looks to other industries for inspiration.	Interviews (Study 1a)
EOR3	My organization involves external actors (customers, suppliers or researchers) to find new ideas.	Rangus et al. (2016) / Salter et al. (2015)
*EOR4**	*My organization draws inspiration from other existing products to come up with new ideas.*	Interviews (Study 1a)
*EOR5**	*My organization develops external ideas internally.*	Rangus et al. (2016)
*EOR6**	*My organization implements partnerships with other companies to develop new ideas.*	Rangus et al. (2016)
*EOR7**	*My organization outsources some of its design work to find new ideas.*	Rangus et al. (2016)
*EOR8**	*My organization encourages its employees to join formal or informal networks outside the organization.*	Rangus et al. (2016)
*EOR9**	*My organization encourages its employees to join formal or informal networks outside the organization.*	Interviews (Study 1a)
*EOR10**	*My organization encourages its employees to join formal or informal networks outside the organization.*	Experts (Study 1b)
Creative Equipment Routine (CER)		
Regarding creative practices used in your organization, you would say: / 7-point frequency scale (1 = never; 7 = always)		
CER2	My organization conducts training on creativity methods.	Woodman et al. (1993) / Wang and Horng (2002) / Rampa and Agogué (2021)
CER3	My organization dedicates processes that enable us to generate new ideas.	Interviews (Study 1a)
CER4	My organization uses generic methods (e.g., Design Thinking, CPS, TRIZ, C-K method) to generate new ideas.	Interviews (Study 1a)
*CER5***	*In my organization, we have work spaces dedicated to idea development (e.g., generation, rapid prototyping).*	Interviews (Study 1a)
*CER6**	*My organization provides training on design methods.*	Wang and Horng (2002) / Rampa et Agogué (2021)

OCC DIMENSIONS (Continued)		Source (Adapted from)
Internal Agility Routine (IAR)		
Regarding your organization's adaptability, you would say: / 7-point Likert scale (1 = strongly disagree; 7 = strongly agree)		
IAR1	My organization's processes allow it to respond quickly to market needs.	Charbonnier-Voirin (2011)
IAR2	My organization's processes allow for quick decisions when circumstances change.	Charbonnier-Voirin (2011)
IAR3	My organization makes changes quickly to changes in its environment.	Charbonnier-Voirin (2011)
*IAR4***	*My organization frequently tests current developments with its customers.*	Charbonnier-Voirin (2011) / Lindkvist et al. (2017)
*IAR5**	*My organization is able to identify new trends and anticipate change.*	Charbonnier-Voirin (2011)
*IAR6**	*My organization regularly tests its ideas with employees.*	Interviews (Study 1a)
CREATIVE OUTCOME (PREDICTIVE VALIDITY)		
Creative Outcome (CO) (Study 4a)		
Compared to other products/services in the same category to which your organization belong, how would you describe your organization's product/ service? / 7-point semantic differential scale		
CO1	Very ordinary for its category/Very novel for its category	Dean et al. (2016)
CO2	Not creative/Creative	
CO3	Uninteresting/Interesting	
CO4	Not at all innovative/Very Innovative	
Creative Outcome (CO) (Study 4b)		
The products/services of your organization... / 7-point Likert scale (1 = strongly disagree; 7 = strongly agree)		
CO1	…are novel.	Stock et al. (2014)
CO2	…are inventive.	
CO3	…differ significantly in terms of their newness from existing products/services of competitors.	
CO4	…are exceptional.	
CONCURRENT CONSTRUCTS (CONCURRENT VALIDITY)		
Creative Climate (CC) (Study 4a)		
Regarding the work atmosphere in your organization, you would say: / 7-point Likert scale (1 = strongly disagree; 7 = strongly agree)		
CC1	In my organization, I feel that the climate is positive and encourages new ideas.	Sundgren et al (2005)
CC2	In my organization, I feel that people can bring in new ideas and opinions without being immediately criticized.	
*CC3****	*My organization allows us to solve problems and take the actions that we feel are most appropriate in a given situation.*	
CC4	In my organization, I feel that there is a free atmosphere, where the seriousness of the task can be mixed with unusual ideas and humor.	
*CC5****	*Based on my experience, I would say that different opinions, ideas, experiences, and knowledge can be discussed in projects in my organization.*	
*CC6****	*I feel that my organization has a dynamic environment.*	
CC7	In my organization, I feel that people can make decisions even without certainty and all the information desired.	Authors

CONTROLS		
Team Diversity (TD) (Study 4a)		
Regarding the composition of the team you belong to in your organization, you would say: / 7-point Likert scale (1 = strongly disagree; 7 = strongly agree)		
TD1	The composition of my team is varied.	Wu et al. (2019)
TD2	In my team, we have complementary skills and knowledge	
Social Desirability (DES) (Study 4a)		
To what extent would you agree with the following statements: / 7-point Likert scale (1 = strongly disagree; 7 = strongly agree)		
*DES1***	*At work, I am always courteous, even with unpleasant people.*	Hays et al. (1989)
*DES2***	*No matter who I interact with in my organization, I am always a good listener.*	
RDES3	At work, I sometimes feel resentful when I don't get my way (reversed)	Cited in Nagaraj et al. (2020)
RDES4	There have been occasions at work when I have taken advantage of a difficult situation involving my co-workers (reversed).	
Competitive Intensity (CI) (Study 4b)		
In your market...		
CI1	…price competition is very intense.	Stock et al. (2014)
CI2	…price competition is very intense.	
CI3	…competitors are extremely active.	
CI4	…major customers are fiercely contested.	
Attitude Toward the Color Blue as a marker variable (BLUE) (Study 4b)		
To what extent would you agree with the following statements: / 7-point Likert scale (1 = strongly disagree; 7 = strongly agree)		
BLUE1	Blue is a beautiful color.	Miller and Simmering (2023)
BLUE2	Blue is a lovely color.	
BLUE3	Blue is a pleasant color.	
BLUE4	The color blue is wonderful.	
BLUE5	Blue is a nice color.	
BLUE6	I think blue is a pretty color.	
BLUE7	I like the color blue.	

* These items were removed following the EFA of Study 2.
** These items were removed following the CFA of Study 3.
*** These items were removed following the CFA of Study 4a.
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Appendix D1 Mean, standard deviation and matrix of correlations (Study 3)

	M	σ	IISR1	IISR2	IISR3	IMR1	IMR2	IMR3	IMR4	EOR1	EOR2	EOR3	CER1	CER2	CER3	CER4	CER5	IAR1	IAR2	IAR3	IAR4
IISR1	6.126	1.206	1																		
IISR2	6.033	1.301	0.787	1																	
IISR3	6.159	1.204	0.601	0.641	1																
IMR1	4.864	1.724	0.248	0.318	0.266	1															
IMR2	4.841	1.715	0.312	0.375	0.367	0.531	1														
IMR3	5.089	1.641	0.429	0.504	0.383	0.584	0.571	1													
IMR4	3.799	2.035	0.171	0.160	0.210	0.530	0.444	0.337	1												
EOR1	4.869	1.656	0.246	0.276	0.255	0.250	0.288	0.381	0.336	1											
EOR2	4.678	1.646	0.120	0.211	0.258	0.259	0.349	0.371	0.238	0.529	1										
EOR3	4.453	1.824	0.142	0.154	0.170	0.215	0.245	0.294	0.227	0.596	0.510	1									
CER1	3.495	1.915	0.137	0.238	0.224	0.410	0.357	0.397	0.424	0.288	0.355	0.215	1								
CER2	4.364	1.908	0.264	0.339	0.202	0.465	0.362	0.528	0.401	0.384	0.413	0.293	0.596	1							
CER3	3.023	1.963	0.138	0.261	0.181	0.389	0.272	0.351	0.414	0.277	0.370	0.169	0.531	0.520	1						
CER4	4.023	2.163	0.226	0.320	0.235	0.384	0.289	0.416	0.360	0.258	0.367	0.224	0.439	0.630	0.559	1					
CER5	3.972	1.869	0.218	0.321	0.275	0.443	0.385	0.449	0.418	0.319	0.298	0.210	0.787	0.522	0.481	0.415	1				
IAR1	5.140	1.553	0.344	0.372	0.315	0.370	0.289	0.494	0.275	0.294	0.264	0.199	0.313	0.402	0.352	0.361	0.372	1			
IAR2	5.154	1.535	0.459	0.517	0.401	0.363	0.432	0.574	0.265	0.313	0.273	0.208	0.312	0.397	0.307	0.383	0.371	0.716	1		
IAR3	5.126	1.538	0.437	0.458	0.354	0.391	0.417	0.474	0.245	0.277	0.257	0.128	0.341	0.402	0.327	0.401	0.385	0.663	0.821	1	
IAR4	5.304	1.617	0.317	0.370	0.356	0.338	0.302	0.370	0.238	0.297	0.365	0.232	0.330	0.388	0.280	0.321	0.337	0.489	0.577	0.598	1

Appendix D2. Mean, standard deviation and matrix of correlations (Study 4a)

	M	σ	IISR1	IISR2	IISR3	IMR1	IMR2	IMR3	EOR1	EOR2	EOR3	CER1	CER2	CER3	CER4	IAR1	IAR2	IAR3	CO1	CO2	CO3	CO4	CC1	CC2	CC3	CC4	TD1	TD2	RDES3	RDES4
IISR1	5.991	1.155	1																										
IISR2	6.095	1.092	0.754	1																									
IISR3	6.182	1.087	0.631	0.628	1																								
IMR1	5.086	1.701	0.421	0.455	0.495	1																							
IMR2	5.050	1.659	0.341	0.340	0.461	0.674	1																						
IMR3	5.223	1.630	0.338	0.370	0.477	0.719	0.708	1																					
EOR1	4.345	1.495	0.174	0.178	0.161	0.383	0.271	0.349	1																				
EOR2	4.245	1.586	0.161	0.158	0.149	0.343	0.304	0.323	0.522	1																			
EOR3	4.036	1.638	0.128	0.164	0.150	0.445	0.226	0.337	0.621	0.455	1																		
CER1	4.077	2.011	0.274	0.292	0.338	0.560	0.448	0.506	0.359	0.250	0.336	1																	
CER2	4.495	1.893	0.368	0.375	0.402	0.629	0.473	0.614	0.341	0.317	0.409	0.751	1																
CER3	3.527	2.019	0.280	0.286	0.310	0.524	0.390	0.484	0.334	0.210	0.349	0.711	0.649	1															
CER4	4.014	2.207	0.312	0.322	0.357	0.578	0.423	0.538	0.320	0.266	0.342	0.661	0.650	0.699	1														
IAR1	5.109	1.537	0.340	0.312	0.349	0.480	0.456	0.444	0.291	0.199	0.247	0.479	0.479	0.412	0.507	1													
IAR2	5.277	1.474	0.270	0.287	0.288	0.431	0.366	0.394	0.226	0.137	0.191	0.390	0.394	0.325	0.372	0.712	1												
IAR3	5.327	1.415	0.200	0.207	0.234	0.436	0.337	0.420	0.305	0.186	0.241	0.489	0.454	0.387	0.424	0.691	0.742	1											
CO1	4.964	1.555	0.224	0.241	0.298	0.466	0.408	0.480	0.353	0.237	0.336	0.383	0.447	0.422	0.452	0.431	0.387	0.358	1										
CO2	5.536	1.555	0.406	0.396	0.379	0.585	0.489	0.547	0.376	0.419	0.405	0.502	0.548	0.449	0.507	0.429	0.332	0.355	0.607	1									
CO3	5.550	1.560	0.332	0.333	0.377	0.550	0.481	0.512	0.348	0.387	0.414	0.405	0.528	0.445	0.448	0.469	0.451	0.392	0.622	0.675	1								
CO4	5.250	1.549	0.313	0.305	0.361	0.547	0.477	0.526	0.317	0.271	0.405	0.460	0.510	0.504	0.493	0.526	0.415	0.431	0.749	0.712	0.670	1							
CC1	5.764	1.324	0.512	0.480	0.506	0.486	0.455	0.433	0.249	0.295	0.242	0.377	0.477	0.414	0.450	0.464	0.410	0.324	0.424	0.537	0.569	0.495	1						
CC2	5.909	1.232	0.449	0.441	0.442	0.416	0.411	0.404	0.208	0.245	0.239	0.261	0.384	0.379	0.358	0.382	0.369	0.279	0.437	0.477	0.534	0.479	0.751	1					
CC4	5.645	1.300	0.472	0.432	0.463	0.408	0.379	0.406	0.286	0.251	0.253	0.290	0.381	0.266	0.341	0.353	0.344	0.309	0.276	0.466	0.384	0.328	0.601	0.581	0.576	1			
CC7	5.214	1.380	0.339	0.317	0.208	0.255	0.203	0.297	0.185	0.239	0.219	0.195	0.290	0.274	0.240	0.202	0.249	0.177	0.278	0.373	0.278	0.300	0.435	0.404	0.485				
TD1	5.995	0.953	0.390	0.408	0.477	0.389	0.373	0.400	0.232	0.242	0.216	0.331	0.424	0.326	0.302	0.337	0.352	0.357	0.305	0.444	0.425	0.452	0.509	0.470	0.530	0.426	1		
TD2	5.605	1.202	0.122	0.185	0.174	0.236	0.214	0.273	0.170	0.097	0.172	0.203	0.249	0.205	0.269	0.216	0.209	0.208	0.207	0.267	0.241	0.257	0.257	0.259	0.361	0.313	0.421	1	
RDES3	4.341	1.687	0.149	0.133	0.195	0.088	0.098	0.170	0.000	-0.03	-0.081	0.050	0.078	0.076	0.142	0.165	0.155	0.068	0.142	0.151	0.235	0.205	0.194	0.162	0.201	0.02	0.239	0.015	1
RDES4	5.123	1.769	0.039	0.034	0.071	-0.122	-0.018	-0.076	-0.095	-0.043	-0.217	-0.141	-0.116	-0.173	-0.131	-0.065	-0.038	-0.064	-0.033	0.712	0.670	-0.036	0.012	0.066	0.044	0.029	0.071	-0.005	0.436	1

Appendix D3 Mean, standard deviation and matrix of correlations (Study 4b)

	M	σ	IISR1	IISR2	IISR3	IMR1	IMR2	IMR3	EOR1	EOR2	EOR3	CER1	CER2	CER3	CER4	IAR1	IAR2	IAR3	CO1	CO2	CO3	CO4	CI1	CI2	CI3	CI4	BLUE1	BLUE2	BLUE3	BLUE4	BLUE5	BLUE6	BLUE7
IISR1	5.463	1.795	1																														
IISR2	5.424	1.855	0.537	1																													
IISR3	5.517	1.898	0.538	0.607	1																												
IMR1	5.337	1.485	0.311	0.330	0.265	1																											
IMR2	4.990	1.654	0.201	0.284	0.253	0.654	1																										
IMR3	5.176	1.644	0.283	0.358	0.312	0.741	0.644	1																									
EOR1	4.449	1.664	0.198	0.273	0.238	0.439	0.397	0.503	1																								
EOR2	4.380	1.654	0.224	0.284	0.260	0.488	0.451	0.519	0.682	1																							
EOR3	4.337	1.732	0.136	0.227	0.160	0.327	0.333	0.453	0.631	0.634	1																						
CER1	4.293	1.966	0.239	0.366	0.289	0.581	0.512	0.659	0.559	0.564	0.571	1																					
CER2	4.644	1.753	0.288	0.381	0.305	0.647	0.523	0.678	0.568	0.611	0.527	0.784	1																				
CER3	3.595	1.768	0.063	0.232	0.066	0.314	0.272	0.338	0.384	0.405	0.485	0.539	0.524	1																			
CER4	4.151	2.017	0.182	0.277	0.166	0.510	0.413	0.548	0.429	0.466	0.490	0.723	0.718	0.570	1																		
IAR1	5.137	1.550	0.293	0.333	0.341	0.546	0.446	0.571	0.465	0.480	0.434	0.555	0.655	0.301	0.493	1																	
IAR2	5.112	1.678	0.282	0.363	0.388	0.484	0.431	0.561	0.380	0.419	0.334	0.561	0.582	0.192	0.398	0.716	1																
IAR3	5.093	1.617	0.304	0.368	0.385	0.559	0.468	0.611	0.413	0.452	0.386	0.531	0.622	0.219	0.386	0.760	0.730	1															
CO1	4.737	1.410	0.186	0.245	0.207	0.363	0.362	0.398	0.234	0.302	0.299	0.454	0.372	0.224	0.374	0.378	0.352	0.365	1														
CO2	5.190	1.431	0.267	0.256	0.222	0.420	0.372	0.444	0.172	0.272	0.281	0.498	0.477	0.211	0.386	0.455	0.424	0.446	0.598	1													
CO3	4.878	1.502	0.185	0.225	0.148	0.383	0.379	0.461	0.271	0.236	0.282	0.522	0.434	0.216	0.440	0.403	0.328	0.404	0.649	0.641	1												
CO4	5.107	1.424	0.318	0.222	0.168	0.416	0.313	0.463	0.313	0.307	0.325	0.479	0.532	0.251	0.447	0.489	0.397	0.496	0.605	0.666	0.632	1											
CI1	4.680	1.687	0.048	0.072	0.040	0.323	0.248	0.270	0.223	0.239	0.212	0.305	0.239	0.166	0.330	0.253	0.167	0.232	0.197	0.239	0.284	0.316	1										
CI2	5.127	1.622	0.130	0.107	-0.009	0.300	0.238	0.219	0.150	0.210	0.203	0.236	0.185	0.143	0.289	0.282	0.205	0.235	0.218	0.239	0.236	0.295	0.687	1									
CI3	5.361	1.388	0.241	0.207	0.122	0.378	0.226	0.365	0.388	0.373	0.365	0.331	0.381	0.238	0.322	0.412	0.300	0.402	0.259	0.269	0.179	0.375	0.527	0.639	1								
CI4	5.000	1.581	0.138	0.127	0.088	0.276	0.262	0.283	0.259	0.240	0.213	0.287	0.186	0.072	0.338	0.264	0.207	0.251	0.200	0.184	0.275	0.316	0.652	0.640	0.605	1							
BLUE1	5.839	1.220	0.122	-0.002	0.034	0.144	0.087	0.156	0.108	0.157	0.190	0.157	0.172	0.088	0.080	0.165	0.102	0.144	0.132	0.147	0.222	0.241	0.189	0.181	0.266	0.206	1						
BLUE2	5.771	1.116	0.066	-0.021	0.098	0.115	0.041	0.113	0.082	0.077	0.154	0.118	0.121	0.042	0.039	0.157	0.071	0.178	0.117	0.138	0.185	0.259	0.138	0.114	0.171	0.156	0.718	1					
BLUE3	5.878	1.080	0.138	0.009	0.029	0.105	0.071	0.125	0.137	0.161	0.300	0.162	0.153	0.164	0.114	0.174	0.062	0.057	0.146	0.161	0.190	0.264	0.204	0.233	0.271	0.195	0.681	0.680	1				
BLUE4	5.785	1.143	0.085	-0.015	0.056	0.155	0.149	0.137	0.110	0.160	0.205	0.157	0.174	0.139	0.112	0.238	0.092	0.194	0.150	0.208	0.176	0.285	0.190	0.205	0.281	0.190	0.769	0.753	0.678	1			
BLUE5	5.839	1.052	0.125	0.018	0.091	0.239	0.191	0.209	0.027	0.151	0.135	0.141	0.134	0.115	0.088	0.227	0.135	0.167	0.163	0.213	0.226	0.277	0.183	0.207	0.228	0.189	0.660	0.632	0.630	0.717	1		
BLUE6	5.815	1.161	0.124	0.025	0.048	0.170	0.142	0.161	0.132	0.193	0.224	0.200	0.179	0.157	0.163	0.210	0.116	0.129	0.147	0.210	0.189	0.291	0.277	0.265	0.328	0.291	0.768	0.663	0.725	0.779	0.714	1	
BLUE7	6.015	1.091	0.064	0.033	0.055	0.106	0.092	0.124	0.040	0.106	0.200	0.163	0.159	0.138	0.115	0.167	0.063	0.077	0.149	0.183	0.151	0.254	0.247	0.220	0.239	0.182	0.694	0.679	0.729	0.737	0.660	0.811	1

Appendix E1 First-order measurement model test (Study 3)

	λ stand.	S.E.	*t*-test	*p*-value
Internal Idea Socialization Routine (IISR)				
IISR1	0.849	–	–	–
IISR2	0.925	0.076	15.374	*0.000*
IISR3	0.701	0.072	11.421	*0.000*
Idea Management Routine (IMR)				
IMR1	0.693	–	–	–
IMR2	0.684	0.111	8.840	*0.000*
IMR3	0.856	0.113	10.398	*0.000*
External Openness Routine (EOR)				
EOR1	0.785	–	–	–
EOR2	0.713	0.100	9.032	*0.000*
EOR3	0.719	0.111	9.084	*0.000*
Creative Equipment Routine (CER)				
CER1	0.695	–	–	–
CER2	0.840	0.115	10.454	*0.000*
CER3	0.679	0.113	8.822	*0.000*
CER4	0.734	0.126	9.456	*0.000*
Internal Agility Routine (IAR)				
IAR1	0.763	–	–	–
IAR2	0.940	0.085	14.385	*0.000*
IAR3	0.872	0.083	13.600	*0.000*

Fit measures: $Chi^2/94 = 1.401$; RMSEA = 0.043; TLI = 0.972; CFI = 0.978; SRMR = 0.047; PCLOSE = 0.726

Appendix E2 Second-order measurement model test (Study 4a)

	λ stand.	S.E.	*t-test*	*p*-value
OCC dimensions				
Internal Idea Socialization Routine (IISR)	0.642	0.073	8.666	*0.000*
IISR1	0.859	–	–	–
IISR2	0.861	0.067	14.161	*0.000*
IISR3	0.748	0.067	12.222	*0.000*
Idea Management Routine (IMR)	0.890	0.102	12.853	*0.000*
IMR1	0.869	–	–	–
IMR2	0.787	0.064	13.798	*0.000*
IMR3	0.848	0.061	15.361	*0.000*
External Openness Routine (EOR)	0.577	0.098	7.211	*0.000*
EOR1	0.817	–	–	–
EOR2	0.632	0.097	8.421	*0.000*
EOR3	0.754	0.106	9.498	*0.000*
Creative Equipment Routine (CER)	0.827	0.121	11.699	*0.000*
CER1	0.854	–	–	–
CER2	0.852	0.06	15.598	*0.000*
CER3	0.808	0.066	14.391	*0.000*
CER4	0.800	0.073	14.168	*0.000*
Internal Agility Routine (IAR)	0.684	0.095	9.233	*0.000*
IAR1	0.839	–	–	–
IAR2	0.857	0.067	14.549	*0.000*
IAR3	0.842	0.065	14.281	*0.000*
Creative Climate (CC)				
CC1	0.886	–	–	–
CC2	0.829	0,06	14.402	*0.000*
CC4	0.709	0,067	11.725	*0.000*
CC7	0.519	0,077	7.897	*0.000*

Fit measures: $Khi^2/164 = 1.615$; RMSEA = 0.053; TLI = 0.955; CFI = 0.961; SRMR = 0.063; PCLOSE = 0.326
Only variables considered as latent variables are included in the measurement model. Creative Outcome, Team Diversity and Social Desirability are considered as indices in Study 4a.

Appendix E3 Second-order measurement model (Study 4b)

	λ stand.	S.E.	*t-test*	*p*-value
Internal Idea Socialization Routine (IISR)	0.528	0.108	6.004	
IISR1	0.684			–
IISR2	0.799	0.138	8.752	*0.000*
IISR3	0.762	0.136	8.646	*0.000*
Idea Management Routine (IMR)	0.880	0.091	12.059	
IMR1	0.840			–
IMR2	0.736	0.083	11.783	*0.000*
IMR3	0.890	0.077	15.214	*0.000*
External Openness Routine (EOR)	0.777	0.105	10.033	
EOR1	0.813			–
EOR2	0.840	0.082	12.571	*0.000*
EOR3	0.764	0.086	11.41	*0.000*
Creative Equipment Routine (CER)	0.922	0.116	13.75	
CER1	0.883			–
CER2	0.909	0.049	18.566	*0.000*
CER3	0.585	0.065	9.203	*0.000*
CER4	0.793	0.064	14.455	*0.000*
Internal Agility Routine (IAR)	0.822	0.095	11.697	*0.000*
IAR1	0.874			–
IAR2	0.824	0.069	14.704	*0.000*
IAR3	0.873	0.065	16.048	*0.000*
Creative outcome (CO)				
CO1	0.760			–
CO2	0.804	0.094	11.439	
CO3	0.802	0.098	11.411	
CO4	0.811	0.093	11.541	*0.000*

Fit measures: Chi2/164 = 1.465; RMSEA = 0.048; TLI = 0.966; CFI = 0.970; SRMR = 0.054; PCLOSE = 0.601
Only variables considered as latent variables are included in the measurement model.

Appendix F The second-order structural model test (Study 4b)

			Stand. Par.	S.E.	*t*-test	*p*
OCCs	←	Internal Idea Socialization Routine	0.526			
OCCs	←	Idea Management Routine	0.883	0.295	5.781	*0.000*
OCCs	←	External Openness Routine	0.779	0.296	5.507	*0.000*
OCCs	←	Creative Equipment Routine	0.918	0.417	5.922	*0.000*
OCCs	←	Internal Agility Routine	0.824	0.301	5.739	*0.000*
OCCs	←	Creative Outcome	0.647	0.214	4.995	*0.000*
Competitive Intensity	←	OCCs	0.392	0.045	4.185	*0.000*
Competitive Intensity	←	CO	0.105	0.053	1.587	*0.113*
Attitude Toward the Color Blue	←	OCCs	0.119	0.048	1.642	*0.101*

Fit measures: Khi2/201 = 1.474; RMSEA = 0.048; TLI = 0.959; CFI = 0.964; SRMR = 0.053; PCLOSE = 0.590

Appendix G1 Correlation matrix between OCC dimensions (Study 2)

	IISR	IMR	EOR	CER	IAR
IISR	1				
IMR	0.449**	1			
EOR	0.400**	0.537**	1		
CER	0.390**	0.656**	0.518**	1	
IAR	0.524**	0.560**	0.527**	0.485**	1

** The correlation is significant at the 0.010 level (two-tailed).

Appendix G2 Correlation matrix between OCC dimensions (Study 3)

	IISR	IMR	EOR	CER	IAR
IISR	1				
IMR	0.477**	1			
EOR	0.273**	0.416**	1		
CER	0.323**	0.561**	0.439**	1	
IAR	0.507**	0.552**	0.322**	0.487**	1

** The correlation is significant at the 0.010 level (two-tailed).

Appendix G3 Correlation matrix between OCC dimensions (Study 4a)

	IISR	IMR	EOR	CER	IAR
IISR	1				
IMR	0.519**	1			
EOR	0.215**	0.447**	1		
CER	0.420**	0.656**	0.439**	1	
IAR	0.349**	0.521**	0.300**	0.542**	1

** The correlation is significant at the 0.010 level (two-tailed).

Appendix G4 Correlation matrix between OCC dimensions (Study 4b)

	IISR	IMR	EOR	CER	IAR
IISR	1				
IMR	0.389**	1			
EOR	0.299**	0.557**	1		
CER	0.335**	0.663**	0.673**	1	
IAR	0.445**	0.647**	0.522**	0.591**	1

** The correlation is significant at the 0.010 level (two-tailed).