Chapter 1

Creativity and Innovation: State of the Art and Future Perspectives for Research*

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Creativity is a vibrant field of scientific research with important applied implications for the management of innovation. In this chapter, we argue that the proliferation of creativity research has led to positive and less positive outcomes and discuss five relevant research themes. We first introduce our readers to the different proposed dimensions of a creative object. Next, we explain recent developments on the level of the creativity magnitude issue. Based on this, we review how researchers currently operationalize creativity. After discussing how creativity is conceptualized and operationalized, we outline how it might be enhanced. Finally, we present an overview of the wide variety of methodological approaches currently used in creativity research. We close by calling for more interdisciplinary research and offering other suggestions for future directions.

Keywords: Creativity; innovation; ideation; creative thinking; creative performance; magnitude.

Introduction

Governments, companies, research centers, universities and schools spend a great deal of time trying to understand how to be more creative and innovate, as well as to be more creative *in order to* innovate. Creativity and innovation are at the core of important outcomes such as economic and sales growth, scientific production and students' learning (Reiter-Palmon, Beghetto, & Kaufman, 2014). Hence, it is not surprising to find scientific articles, intervention programs, conferences, seminars, consulting offers and casual conversations on creativity and innovation across a wide variety of disciplines, including business and management, marketing, engineering, design, psychology, and education, and among different segments of

*This chapter is a modified version of the introduction for the Special Issue on "Creativity in Innovation Management" in the *International Journal of Innovation Management*, 20(4), 2016, with permission from the publisher.

the population ranging from managers and consultants to research scientists and educators. However, like most things in life, the proliferation of interest in creativity has led to positive and less positive outcomes.

On the positive side, we now have literally thousands of dedicated researchers and practitioners trying to better understand what drives creativity, how creativity can be enhanced and the implications of creativity for the management of innovation, among other aspects. It is safe to assume that this dedicated, genuine interest is producing useful information. The amount of knowledge generated is indeed vast and addresses very specific cross-disciplinary topics in regard to creativity, ranging from knowledge acquisition and knowledge transfer aspects of creativity to the motivational components of creativity, to mention a few examples. On the less positive side, the observed proliferation has resulted in a highly fragmented field (Hennessey & Amabile, 2010). Similarly, it also led to having many research areas showing a wide variety of perspectives with different levels of consensus. On the one hand, this observed fragmentation might not be efficient if that new knowledge production does not entirely come from “all” we know about creativity but rather from what different researchers consider important to know, given their domain of expertise. Hence, two researchers, one from engineering and another from psychology, might have a research topic in common but read and consult different journals, attend different conferences and have disagreements about what constitutes a significant contribution in creativity research. On the other hand, the abundance of different perspectives on the same issue can lead to a lack of consensus on what the main directions for future research are in order to increase our understanding of creativity as a part of the innovation process. In the worst case, it even leads to a complete parallel development of research streams without even knowing that the others exist. Even though nowadays knowledge is available worldwide through modern information technologies, the knowledge is still dispersed over disciplines, countries, languages, subject fields, and even publication formats like journals or books.

The purpose of this chapter is twofold. First, we offer an illustrative and not comprehensive discussion on five issues relevant for creativity and their implications for innovation. We propose that these five issues represent important research themes for future knowledge production. Second, we propose some key directions for future research.

As stated earlier, we organize our paper around five main sections that encompass the issues that are at the core of this chapter. In the first section, we discuss the conceptualization of creativity in terms of its dimensionality. We then cover, in the second section, the level of creativity magnitude, followed by a discussion on how researchers operationalize creativity in the third theme. In the fourth section, we explain how creativity can be enhanced. Last, in the fifth section, we discuss the diversity of approaches used to conduct research on creativity and examine in more depth the implications of the fragmentation of the field. Before beginning our discussion of our first theme, two caveats are in order. First, our goal is to illustrate rather than comprehensively review all the information available on these research areas. Second, our main goal is to provide an illustration of these five issues, pointing out the level of agreement and disagreement for each, and not to provide or propose a new theoretical model capable of integrating all the information available.

The Dimensionality of Creativity

Clear conceptual definitions of scientific constructs can act as a catalyst for the growth and integration of applied and theoretical knowledge. It creates common understandings that are prerequisites of an effective exchange of ideas and to develop a joint knowledge base (Suddaby, 2010). Apparently, such clear inter-disciplinary definitions are not set yet.

The conceptual definition of creativity might focus on the person, process or product. Yet, more efforts have been devoted to provide a conceptual definition for a creative product since it is assumed that the result of a creative process or a creative personality is an object (it may be a product, a service or an

organization) that must be considered as creative. Hence, we focus on reviewing the conceptualization of creativity as it relates to objects, describing the number of dimensions proposed in order to consider something as creative and examining some possible relations between the suggested dimensions. It is important to mention the following caveat. The main goal of this section is to conduct not an exhaustive but rather a more illustrative review of some of the proposed dimensions of creativity. Hence, we do not claim to have reviewed every single paper proposing different dimensions of creativity. Instead, we focus on reviewing a few selected articles with important implications for creativity in the process of innovation.

From reviewing different papers on the conceptualization of creativity, we see two main issues related to the dimensionality of creativity. The first deals with the number and nature of the dimensions proposed. The second deals with the suggested structure or relationships between these dimensions. Both issues have important implications for understanding and conducting research on creativity and also for managing creativity. We begin with the discussion of the dimensionality of creativity.

We can trace back some of the first definitions of creativity to 1953 (Stein, 1953). This definition suggests that a creative work must be *novel* and *useful* for a group of people at some point in time. Hence, the definition emphasizes two dimensions: novelty and usefulness and also proposes that an object becomes creative when people judge it to be creative in a given socio-cultural context. Researchers across different disciplines such as organizational psychology, management and engineering seem to agree that a creative production must be novel and useful (Amabile, 1983; Anderson, Potocnik, & Zhou, 2014; Cropley & Cropley, 2005). Hence, there seems to be some degree of consensus on the novelty and usefulness dimensions of creativity. Yet, other dimensions have also been proposed.

For example, a recent conceptual contribution proposed that surprise should be added to the novelty and usefulness dimensions (Simonton, 2012). The suggestion to add surprise comes from the criteria set by the U.S. patent office when deciding to give a certain product a patent. Similarly, two additional conceptualizations agreed that a creative product must have novelty and usefulness. Yet, one conceptualization added the dimension of elegance (Cropley & Cropley, 2005), the other suggested a dimension of style, both referring to the design of a particular product (O'Quin & Besemer, 2006). Elegance and style might be related to the aesthetic appeal of a product. A similar proposition has been made to assess the creativity of advertising. Specifically, a three-dimensional conceptualization has proposed that advertising products need to have novelty, usefulness and surprise in order to be considered as creative (West, Caruana, & Leelapanyalert, 2013).

Another conceptualization also incorporates novelty but divides usefulness in two subcomponents as part of its conceptual definition: feasibility and value. The authors claim that dividing usefulness in two components can have important research and managerial implications (Litchfield, Gilson, & Gilson, 2015). For example, an idea for a new product with high novelty and value might not be perceived as feasible because it is "too different" from what the company has done in the past. Conversely, an idea with high novelty and high feasibility but low value might be easily accepted by managers but might lack enough value to really make a difference in the market place.

In sum, most creativity researchers agree that a creative object, may it be a product, service, advertising commercial or marketing campaign must be novel and useful. Different conceptualizations disagree on the third dimension. More importantly, however, is the discussion on whether an object can be considered as creative if it has novelty but not usefulness or if it is useful but not novel. The core of this debate is the structure or relationship between the suggested dimensions of creativity.

For example, one proposition suggests that the relationship between the different dimensions of creativity is multiplicative. Hence, this model proposes that $\text{creativity} = \text{novelty} \times \text{usefulness} \times \text{surprise}$. A multiplicative model implies that if a given object has a value of 0 on either of the three components, the overall creativity would be zero. Indeed, the measurement representation of the dimensions of creativity

can have important implications. Whereas one conceptualization might assume a one-factor model with indicators of novelty and usefulness (Zhou & George, 2001), another one might assume a two-factor solution with reflective or formative indicators (Sullivan & Ford, 2010). The implications of adopting any of these options are not trivial since it could lead to different methodological approaches and results.

The Level of Creativity Magnitude

A closely related issue to the dimensions of creativity is the level of creativity magnitude. This issue becomes relevant because researchers can focus on understanding the creative objects generated by geniuses, professionals, “regular” individuals or even children. It is obvious that the predictors or consequences of creative geniuses or children are not the same, emphasizing the need to differentiate between different levels of creativity.

Different models have been proposed to guide our understanding of levels of creativity. One, for example, makes a distinction between personal and historical creativity (Boden, 2004). Whereas in personal creativity individuals make a personal judgment as to how novel or useful their own ideas are, in historical creativity, a wider audience makes such judgment.

A more robust model proposes four levels of creativity called Mini-c, Little-c, Pro-c, and Big-C (Kaufman & Beghetto, 2009). These four levels form a developmental continuum that starts with Mini-c. Mini-c level of creativity is characterized by being primarily a personal judgment and is grounded in individual learning processes. For example, individuals might experience a feeling of being creative when learning about the different media outlets available to advertise their new product. This insight might not have great external value, but it is important for individuals since it provides positive feelings about the learning process. Little-c creativity, continuing with the same example, might be represented by a novice brand manager’s suggestion to use more social media in their marketing communication efforts because the brand’s target is mainly teenagers. While the suggestion is useful and well-thought, it might not represent a ground-breaking idea. In other terms, Little-c creativity can be seen as everyday creativity. Pro-c includes the creative productions generated by experts in a given field.

Hence, an excellent advertising campaign that is able to increase sales by a significant percentage might represent an example of Pro-c creativity. The creative product, an advertising campaign, generates positive outcomes for a brand/company, yet it does not have worldwide recognition. Last, Big-C creativity represents the highest level of creative magnitude that only selected people are able to achieve in their lifetime. Whereas it is easier to mention examples of Big-C from science or music such as the theory of evolution developed by Darwin or the fifth symphony composed by Beethoven, it is not as easy to think of examples from the private sector. Yet, some might place the invention of the internet or the smartphone as products that are highly novel and useful and widely accepted by a large percentage of the world population.

From this brief discussion of the levels of creativity magnitude, the connection between the dimensions of creativity and the levels of creativity becomes obvious. Objects with different levels of creativity magnitude would have, hypothetically, different scores on the novelty, usefulness and eventually surprise or aesthetics dimensions. For instance, if one were to evaluate the internet as a product, it would probably have very high scores on novelty, usefulness and surprise. Conversely, the evaluation of a popular product such as the headphones Beats® would also have high but lower scores on novelty, usefulness and surprise than the invention of the internet.

The elaboration on the level of creativity magnitude has met great recognition in the psychology literature, but remains confined in this field, raising several questions in regard to its operationalization. Typically, while the four C model of creativity has been useful and people seem to recognize different levels

of creativity (Puentes-Díaz, Maier, Brem, & Cavazos Arroyo, 2016), to our knowledge, it does not provide precise criteria for deciding, for example, if an object should be classified as Pro-c or Big-C. Yet, one might argue that something similar happens with most judgments of creativity and even with the classification of presumably more objective phenomena such as the diagnosis of diabetes based on the levels of blood glucose or the diagnosis of hypertension based on blood pressure.

It is also accepted in the field of creativity that a product becomes creative when individuals agree that it is creative (Amabile, 1996). A product with “great” potential becomes a success only when thousands of consumers agree, explicitly or implicitly, that the product is novel, useful, and surprising. Take the iPhoneTM as an example. Up to December 2015, Apple has reported unit sales of 231.22 million iPhones in 2015.^a If we take into account that the world population is about 7.3 billion and assuming that iPhone sales represent “unique” buyers, then we could claim that more than 3% of the world has bought an iPhone in 2015. Hence, even though consumers are not explicitly making a judgment about the novelty, usefulness and surprise of the iPhone, we might safely conclude that this product is extremely creative based on its success in the market. However, one could also argue that this goes beyond the concept of creativity, as innovation is defined as “the development and *implementation* of new ideas (...)” (Van den Ven, 1986, p. 590). Hence, the implementation part is the practical agreement by consumers to purchase the product. This understanding of innovation puts novelty, usefulness and surprise as prerequisites of a successful implementation of an idea, rather than a result.

The Operationalization of Creativity

If we consider creativity as a multi-dimensional construct with different degrees of creativity magnitude, then it follows that the operationalization of creativity needs to be discussed as well. Indeed, the issue of the operationalization of creativity focuses on how researchers are currently determining that a product, service, or process is creative. Due to the different degrees of creativity magnitude, researchers and managers need alternatives for operationalizing creativity. As stated previously, we focus on discussing only a few alternatives on how to measure creativity with a special emphasis on measuring the creativity of products (for a comprehensive review, see Kaufman, Plucker, & Baer, 2008).

There are several rating scales designed to measure the creativity of products, processes, services, and advertising outputs. For example, one scale, the creative solution diagnosis scale (CSDS), was designed to measure the creativity of products with implications for innovation management (Cropley, Kaufman, & Cropley, 2011). This scale uses 27 items to measure five components: relevance and effectiveness, problematization, propulsion, elegance, and genesis. Scores from this scale have shown appropriate psychometric properties in terms of factorial validity and reliability. In addition, scores from these five components have been able to predict overall creativity judgments. Some advantages of this scale are that it is easy to administer, it has been tested with non-experts, and it is based on a theoretical model of functional creativity. One major limitation is that the scores have not been tested for predictive validity, an issue highly relevant for innovation managers. A difficult yet important test for the predictive validity of this scale would involve obtaining scores on the five dimensions for different products and correlating the scores with indicators of market performance across time (e.g. market share, sales, top of mind), while controlling for other variables known to influence the indicators of market performance. If the scores from this scale are meaningful, then one would expect high scores on relevance or propulsion, for example, to correlate positively with market share or sales.

^aSee Statista, <http://www.statista.com/statistics/263401/global-apple-iphone-sales-since-3rd-quarter-2007/> for information.

The consensual assessment technique (CAT) involves asking a group of judges — mainly experts but non-experts have been used as well — to judge how creative an object is (Amabile, 1982). One strength of the CAT is that it is consistent with a conceptual definition of creativity, which proposes “A product or response is creative to the extent that appropriate observers independently agree that is creative” (Amabile, 1982, p. 1001). With regards to the specific procedure, judges are asked to place the products or objects being evaluated in one of five categories ranging from very uncreative to very creative. Because judges are asked to make their evaluations in relation to the objects being evaluated, the resulting judgments can only be interpreted in relation to these objects. In other words, the creativity evaluations cannot be used to make comparisons outside that specific judgment task, which represents a limitation.

In terms of the psychometric properties of this technique, the judgments appear to be reliable across evaluators (Amabile, 1996). In terms of validity, the assessment has face validity since it appears to measure what is supposed to measure. The ability of the CAT scores to predict important outcomes such as market success is more limited since the judgments are only relevant within task comparisons. Yet, despite its limitation, the CAT has been widely used across different studies and settings (Kaufman, Plucker, & Baer, 2008).

Impacting Creative Performance

Now that we have discussed how creativity is conceptualized and operationalized, we are in a better position to explain how creativity might be enhanced, and to identify potential managerial factors that may boost creative performance. Over the last two decades, the field of studies on actually managing creativity in organizational contexts has adopted three main angles.

- (1) Environmental factors that *positively influence creativity* in an organization (Amabile & Mukti, 2008).
- (2) Leadership competencies that are relevant to *manage for creativity* (Mueller, Goncalo, & Kamdar, 2011).
- (3) Tools, techniques and methods that can *manage creative thinking* by being deployed to stimulate creativity in collective settings (Paulus & Yang, 2000).

Organizing for creativity is a challenge for firms that face intensive innovation in competitive contexts. To address this challenge, it has been argued that firms must rely on specific capabilities to foster creative behavior: The aim is therefore to develop peripheral factors that can positively influence creativity, while not directly modifying the creative process in itself. One of the most advocated concepts on the topic is the notion of creative climate (Amabile, 1996, 1998). This concept builds on the specific representations that an individual has in regard with the “what” (relations), the “how” (means) and the “why” (outcomes) of a given situation, and which stimulates creativity (Isaksen & Ekvall, 2010). Many studies have examined the elements that may constitute a creative climate, including the degree of individual freedom, the quality of support towards new ideas, a clear and inspiring vision provided by supervisors, and creative encouragement, among others (see Hunter, Bedell, & Mumford, 2007 for a complete meta study on the relationships between climate dimensions and creative performance).

Focusing more precisely on the influence of management on creative performance, another stream of research investigating the operationalization of creativity addresses the role of leadership. Leading creatively can be defined as the ability to lead a group or an organization towards new and innovative paths (Mueller, Goncalo, & Kamdar, 2011). Creative leaders are not only able to generate new ideas, but also help enhance the creativity of other team members. In addition to traditional leadership competencies such as planning, analyzing and decision-making, Palus & Horth (2005) explain that creative leaders must

possess an ability to pay attention to the creative process of others by asking questions, reframing problems and developing connections between the personal passions and the daily work of team members. This take on creative leadership describes a more direct capacity to change the course of a creative process by orienting the nature of ideas that may emerge.

But favoring creativity is not just designing specific managerial devices that may indirectly favor creativity. Creative thinking has been argued to be actually directly manageable, since the advent of brainstorming in the 1960s (Osborn, 1962). Brainstorming is a creativity technique that builds on four main rules that structure a group session of ideation with a facilitator: (1) withhold judgment, (2) encourage wild ideas, (3) quantity rather than quality, and (4) build on others' ideas. Yet, many studies in cognitive psychology have demonstrated that a group using a brainstorming method generates significantly less ideas than the combined total of ideas generated by the same number of individuals brainstorming alone (Diehl & Stroebe, 1987). Many social causes of brainstorming inefficiency have been experimentally identified, such as attention division (Mulligan & Hartman, 1996; Paulus & Yang, 2000), social pressure (Camacho & Paulus, 1995), perceived expertness upon creativity (Collaros & Anderson, 1969), among others. Therefore, today there are wide ranges of management tools, methods and techniques that are currently investigated to palliate brainstorming shortcomings. Searching for "creativity tools" on Google generates more than 120,000 results, widely pointing to diverse methodologies, either theory-driven or empirically based that aim at fostering creativity. However, the studies discussing the relevance of brainstorming never measure the performance of the facilitator of brainstorming, who may encapsulates, while a major part of the success of a brainstorming is based on it. One can easily understand why this role is complex to model and integrate in an experimental protocol. This is indeed a participant who cannot be naive about the objectives of the experiment to which she/he would take part, while her/his training as well as understanding of the issues of the ideation session would be essential to the experimental protocol. Yet, in a way, the literature investigating the methods and tools to enhance the generation of creative ideas does not relate to the studies on creative leadership or on creative climate, eluding the fact that tools are never independent of the actors that deploy and/or enact them.

Methodological Approaches to Creativity

As we have started to underline in the previous sections, a wide set of methods has been deployed from an academic stance to study creativity, depending on the aim but also on the facet of creativity that is under study. Four main types of methods stand out today.

First, at the individual level, creativity is mostly studied (and measured) through the administration of individual questionnaires. The measure of creativity is then based on self-report, such as the creativity scale that measures creativity levels, through a specific derivative of the adjective check list (Gough, 1979) and the Kirton adaptation-innovation inventory (KAI) that measures creative style (see Bobic, Davis, & Cunningham, 1999, for scale and validity). This psychometric-based approach produces correlational studies focusing on individual traits that may be linked to creative performance. Many classical traits studied in psychology and organizational behavior have therefore been examined as potential predictors of the capacity to act creatively (Feist, 1998): among them are psychological preferences using Myer Briggs type indicator (MBTI) scales (Fleenor & Taylor, 1994), or locus of control (Pannells & Claxton, 2008). Research is still providing new constructs and new scales to be the most accurate and consistent creativity assessment tool, especially as the validity of such scales is questioned on a regular basis (Plucker & Runco, 1998).

Still at the individual level, a very different angle has been treated through the use of experiments: these in-lab measures aim at characterizing creative abilities. Two main classes of creative abilities have been

explored. First, divergent thinking tasks evaluate the capacity of individuals to generate many different ideas from a single starting point. Typically, an alternative use task is formulated as to ask the participant to propose as many original alternative uses of a common object — for instance a brick (see the Torrance Tests of Creative Thinking (TTCT)) (Torrance, 1972). Variants of the task may encompass more visual elements, where the examinee is asked to complete a series of 12 incomplete drawings in an original way and create a title (Williams, 1980), or more social elements, where the participant must indicate the consequences of unlikely events such as “What would happen if gravity were cut in half?” (Merrifield, Guilford, Christensen, & Frick, 1962). Yet, another very different way to experiment on creative abilities is to use creative problem solving settings, such as in the remote association task (Mednick, 1962). In these tasks, the participant is asked to find one (and only one) answer to a problem, using his/her creativity. For instance, in the remote association test (RAT), the examinee is given three words and has to find the word that relates to these three words: given the words “rat, blue, cottage”, the expected answer will be cheese. This creative problem solving approach extends to more real settings, where either the task is composed of real elements (for instance: “Design a device that allows people to pick up a book from a shelf (e.g. in a library) that is out of their reach, for instance, above their head”) (Cardoso & Badke-Schaub, 2011), or the participants are real employees given a real problem related to their work environment (Robinson-Morral, Reiter-Palmon, & Kaufman, 2013).

Third, beyond the sole individual level, many qualitative case studies have focused on methods, tools and techniques deployed in teams, firms and organizations to support different facets of creativity. Because methods and tools are deeply contingent to the context of their application and are empirically based rather than theoretically driven, case studies focusing on the specific creativity practices are necessary to explore the complexity of the processes in place. Thus, through case studies, researchers have explored the use of serious games (Agogu, Levillain, & Hooge, 2015), software design (Arrighi, Le Masson, & Weil, 2015), and manual modeling (Schulz, Geithner, Woelfel, & Krzywinski, 2015) of digital tools (Franklin, Searle, Stoyanova, & Townley, 2013 to cite a few very recent published works in 2015).

Last, organizational level questionnaire-based studies aim at building, but this time at a macro-level, correlational studies focusing on managerial factors — for instance style of leadership (Gumusluoglu & Ilsev, 2009; Moss & Ritossa, 2007), motivation (Zhang & Bartol, 2010), or leader–member exchange (LMX) — on creative performance in a collective setting. These questionnaires differ greatly of those administrated at the individual level, as they are indeed not based on self-report but more on supervisor, employee and peer reporting.

Thus, studying creativity is not just complex due to the very different facets of creativity, but also due to the proliferation of methodological stances that can be chosen. To be fair, the fragmentation issue of the field is not just about the choice of method, but also the discipline of academics as well as the field of expertise of readers. Typically, innovation managers prefer certain conferences and journals (e.g. *Technology and Innovation Management*, *Research-Technology Management*), so do management scholars (e.g. *Journal of Product and Innovation Management*, *Creativity and Innovation Management*, and *International Journal of Innovation Management*), psychologists (e.g. *Journal of Creative Behavior*, *Creativity Research Journal*, *Thinking Skills and Creativity*, *Psychology of Aesthetics, Creativity, and the Arts*), industrial designers (e.g. *Design Science*, *Design Studies*), and engineers (e.g. *Research in Engineering Design*, *Journal in Engineering Design*, *International Journal of Design Creativity and Innovation*). These journals reflect the disparity of the field but also the too-often single focus chosen by researchers to conform to a specific discipline and to frame a contribution that fits with the conversation in the journal and the expectations of the audience. What are the implications of this fragmentation? Most importantly, it sheds light on the current difficulties to do cross-disciplinary research as well as the difficulties to have a coherent view of the field to estimate the significance of a research contribution to the creativity body of knowledge.

This is all the more crucial as the interdisciplinary understanding of creativity is key for organizations. In companies typically, the (corporate) innovation management is a fertile ground where inter-disciplinary discussions from different departments and functional areas take place and grow. There the key task of the staff is to manage innovation across organizational and functional boundaries, so all strategic and operative initiatives to develop and diffuse new products take place (Brem & Voigt, 2009).

In sum, one of the objectives of our paper was to briefly discuss five relevant themes in creativity research and their implications for innovation management. As suggested earlier, the explosion of creativity research has generated a great deal of theoretical and applied knowledge. The amount of knowledge generated is so vast that now we might have the challenge of assimilating, internalizing, and integrating what we know thus far with the objective of determining what we need to know next. Creativity is definitely an exciting area of research and this excitement is widely shared.

Directions for Future Research

As shown through our paper, creativity is a vibrating field with important implications for different academic fields. Yet, if the field of creativity wants to continue growing, more research is needed across different research themes. Based on our discussion of five aspects of creativity research and its linkages to innovation, we would like to propose different directions for future research.

In a nutshell, we call for much more research that takes the *interdisciplinary nature of creativity* into consideration. This goes beyond cross-disciplinary research questions and methodological approaches, but includes also new research team setups and collaborations. Academics must accept the challenge of bringing creativity research from a specific and fragmented field into a much broader, international domain of expertise. This requires openness and curiosity from all involved parties to accept even very different views on the same phenomenon. For this, editors and publishers of journals, books and conferences are also obliged to be more open for interdisciplinary formats of publications and presentations, taking other academic fields into consideration for a joint increase of understanding and scientific progress.

There is a high potential in the mentioned key areas of creativity, which are focused on conceptualization, magnitude, operationalization, and enhancement of creativity. In the following, we will outline in more detail which concrete research avenues we suggest in this context.

In terms of conceptualization, different researchers tried to suggest comprehensive definitions of creativity, especially in their respective fields. However, a commonly accepted one, which is also coherent with the term innovation, is missing so far. To result in a consolidation of academic fields, it must also go beyond disciplinary boundaries considering number and nature of proposed dimensions, and their structure and relationship between them. Moreover, we would like to propose that the ultimate test for the robustness of the different definitions and conceptualizations of creativity would be to demonstrate that *different combinations of the suggested dimensions lead to important differences in observed outcomes*. Hence, we are suggesting that the ultimate test is one of predictive validity of the suggested dimensions. For example, if a product, in the technology sector, has high levels of usefulness but low levels of novelty, then one might hypothesize that this product would have short-term success because it might be harder to obtain meaningful differentiation in the long run with low levels of novelty. If we are able to test for this in future research, then we might feel more confident about the need to measure each of the agreed dimensions of creativity because they lead to relevant differences in important outcomes such as sales, growth, market share, technology renewal, top of mind, and brand equity, among others.

Similarly, researchers would need to validate the predictive validity of their measurement tools. Hence, one possible avenue for future research might involve assessing if the different dimensions of creativity measured by the rating scales lead to different outcomes. If we believe that it is important to differentiate

novelty from usefulness, then we should be able to predict that a product with high novelty and usefulness might have more market success than a product with low novelty and high usefulness or vice versa. This could represent the “golden” test for the importance of having different dimensions matched with their respective operationalization of the constructs. In this context, we also call for more creativity in studying creativity itself, hence going beyond rating scales and questionnaires. Research in the different domains could offer fresh stances on methodological approaches, especially in the combination of ones that are already established in certain disciplines. For instance, self-reports can be enhanced with supervisor, employee or peer reporting, whereas experimental approaches would gain in relying more on third-parties observation and the use of questionnaires. To do so, it is possible that new types of data may provide opportunities to develop such novel methodological approaches to creativity. Typically, the evolving domain of crowdsourcing might be seen as a new playground for gathering and evaluating creative ideas.

In terms of impacting creative performance, we acknowledge that theoretical integration is required for crafting a more robust conceptualization of creativity management by bridging three different levels of variables that may foster creativity: environmental factors (such as a creative climate), individual factors (such as cognitive style or personality traits) and procedural factors (such as tools to support creative ideation). Such integration may give a more actionable perspective for managers to implement creativity in organizations, by stressing the coherence and even synergy required between the type of work environment, the type of management style and the type of methods in place. Hence, one possible avenue for future research could be to address the elicitation in each field of questions brought from the two other perspectives. For instance, what are the tools and methods that can be deployed to actively build and spread a creative climate?

Finally, we are sure that creativity research will be an even more important field in the future, especially in the context of innovation and its management.

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