



# Examining the relationship between creativity and innovation: A meta-analysis of organizational, cultural, and environmental factors☆



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## ABSTRACT

It is generally believed that creativity enhances innovative activities. However, empirical research regarding the impact of creativity on innovation, although positive, has produced a wide range of results. In this study, we conduct a meta-analysis of 52 empirical samples comprising 10,538 observations to test the nature of this relationship, and in particular how organizational, environmental, and cultural factors moderate the creativity–innovation link. We find a strong positive relationship between creativity and innovation, especially at the individual level. In addition, we find intriguing moderating effects in which the relationship between creativity and innovation is stronger for large firms, process innovations, and low-tech industries relative to small firms, product innovations, and high-tech industries. Further, we find that moderate levels of uncertainty avoidance maximize the correlation between creativity and innovation. We conclude by discussing theoretical and managerial implications and offering suggestions for future research in the entrepreneurship and innovation literature.

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## 1. Executive summary

An innovation process consists of two main activities: creativity and innovation. Creativity involves the generation of novel and useful ideas while innovation entails the implementation of these ideas into new products and processes. This sequence seems logical and fairly evident; however, even a brief look at the innovation efforts of organizations reveals that they face many challenges and obstacles in maintaining smooth and balanced innovation processes. A careful investigation of previous empirical studies shows that the correlation between creativity and innovation varies significantly across empirical contexts and research designs. An intuitive explanation for this heterogeneity is that innovation processes are multifaceted and characterized by tensions. The process whereby creative ideas are transformed into new products and services is significantly affected by variations in institutions, cultures, organizations, and external environments.

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To elucidate some of the factors that explain this variation, we drew on previous empirical studies in the innovation and creativity literature and conducted a meta-analytical study. We used the results of 52 empirical samples comprising 10,538 observations to test the nature and strength of the relationship between creativity and innovation. In particular, we tested how organizational, environmental, and cultural factors moderate the creativity-innovation link. By quantitatively aggregating and analyzing prior research, this study systematically addresses the influence of relevant factors on the conversion of creative ideas into innovative products and services.

In line with our expectation, the results of our study indicate that overall there is a strong positive link between creativity and innovation ( $r = 0.46$ ). The results of our bivariate analysis and meta-regression reveal that creative ideas are more efficiently converted to innovative outputs when the locus of the innovation process is at the individual level. However, we did not find any significant difference between the team and firm levels of analysis. We also found that, relative to small firms, large firms are better at turning creative ideas into innovative outputs. Surprisingly, the results showed that the relationship between creativity and innovation is stronger in low-tech industries compared to high-tech industries. Moreover, our analysis revealed that process-related ideas are converted to innovative outputs at a higher rate relative to product-related ideas. Finally, we tested the effects of the cultural setting on our focal relationship. The results indicated that the creativity-innovation link is strongest in a national setting with a moderate level of uncertainty avoidance. Our expectations that the creativity-innovation link would be strongest in countries with moderate levels of power distance and collectivism were not confirmed.

Overall, the results of our study offer several important theoretical and managerial implications. First, the association between creativity and innovation is highly contextual and multi-level in nature. Hence, researchers should carefully consider the relevant boundary conditions when studying this vital relationship. Second, another important implication of this study is that managers and entrepreneurs can exert a certain degree of control over factors that facilitate the conversion of creative ideas into new innovations. Determining firm size, locating R&D facilities, and managing cultural configuration of human resources are examples of areas that managers can strategically control to make the innovation process smoother and more balanced. Third, our findings imply that entrepreneurs should keep in mind the effect of firm size on their innovation processes. While it is traditionally believed that smaller firms are more creative than larger firms, our results do not show that they are more capable when it comes to leveraging their creativity investments. In fact, larger firms are better in this area likely due to more resource endowments, experience, and better complementary capabilities. Finally, our study highlights that the conversion of ideas into innovations differs across type of innovation projects. Process-related creative ideas are more likely to be converted into innovative outputs compared to product-related ideas, implying that managers should strike a fine balance when it comes to resource allocation.

## 2. Introduction

Creativity is the seed of all innovation. The successful creation of new products, new services, or new business practices starts with a person or a team thinking up a good idea—and developing that idea beyond its initial state (Amabile et al., 1996; Baer, 2012). The conversion of creative ideas into actual new products and processes has long been considered a central challenge in the management of innovation (Van de Ven, 1986) and in the creation of new ventures (Drucker, 1998). Yet, the link between creative activity and innovation is often presumed in the literature and merits a comprehensive and integrative examination. The literature defines creativity as the generation of novel and useful<sup>1</sup> ideas (Amabile, 1996; West, 2002). In contrast, innovation is distinguished from creativity by the implementation, rather than the mere generation, of ideas (Rosing et al., 2011). Idea implementation encompasses activities such as selling ideas, mobilizing sponsorship, gathering the necessary resources, creating the innovation, and introducing the innovation to the marketplace (Axtell et al., 2000).

What makes the conversion of creative ideas into innovative offerings so complex is the fact that creativity and innovation do not necessarily proceed in a linear fashion (Anderson et al., 2004) but rather follow a long-winding, uncertain path with unfavorable outcomes in many instances. The reason why the correlation between creativity and innovation is less than one can be explained by the fact that conversion of creative ideas into innovations encompasses two different and even opposing processes: idea generation and idea implementation (Rosing et al., 2011). Indeed, the generation of novel and useful ideas and their implementation is characterized by tensions (Lewis et al., 2002), paradoxes (Miron et al., 2004), and dilemmas (Benner and Tushman, 2003). For instance, idea generation requires experimentation, disrupts routines, challenges common assumptions (Rosing et al., 2011), and is closely associated with explorative activities (March, 1991). In contrast, idea implementation requires a process, efficiency, goal orientation, and routine execution—attributes most often associated with exploitative activities (March, 1991). Others argue that novelty and usefulness, two central attributes of creativity, hardly go together and may even be inversely related (Rietzschel et al., 2009). Useful ideas are generally valued (Sanchez-Burks, 2005), but the more novel they are, the more questions are raised about their practicality, reproducibility, and reliability (Amabile, 1996), thereby increasing uncertainty for decision makers that allocate resources and those in charge of implementing creative ideas (Baer, 2012). Uncertainty is generally an undesirable state that people seek to avoid (Whitson and Galinsky, 2008). In other words, there is an inherent bias against creative ideas which can stifle their subsequent implementation (Mueller et al., 2012).

For all of these reasons, the link between creativity and innovation might not be as straightforward and as strong as earlier conceptual work suggests (Axtell et al., 2000; Axtell et al., 2006; Clegg et al., 2002; Frese et al., 1999). Although prior research has significantly advanced our understanding of how creative ideas are transformed into innovations and studies on the creativity-

<sup>1</sup> Both novelty and usefulness are necessary but insufficient conditions for successful innovations. Novel ideas that lack usefulness or meaning are merely viewed as bizarre or weird by the target audience (Oldham and Cummings, 1996; Van de Ven, 1986).

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