

DIVERSITY'S CONTINGENT EFFECTS ON INNOVATION AND OPPORTUNITY RECOGNITION: THE ROLE OF ENTREPRENEURIAL SELF-EFFICACY

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INTRODUCTION

Entrepreneurs initiate and maintain collaborations with portfolios of different partner types, such as suppliers, buyers, and customers, with each partner type providing the venture with unique resources and ideas to strengthen the venture's activities. The concept of collaborative partner diversity (*CPD*) incorporates these collaborations with different partner types by reflecting the diversity of partner types with which the venture collaborates at a given point in time. Empirical findings regarding the effects of *CPD* on performance outcomes have been mixed, finding positive (e.g., Baum, Calabrese, & Silverman, 2000) and inverted U-shaped (de Leeuw, Lokshin, & Duysters, 2014; Vasudeva & Anand, 2011) effects. This duality in research findings suggests that not all ventures benefit equally from their collaborative partner diversity, calling for the incorporation of contingency effects in the study of *CPD* effects (Wassmer, 2010). We pose that, in a small business context, the skills of the entrepreneur crucially shape how the venture's collaborative activities affect the entrepreneurial process. We take the concept of entrepreneurial self-efficacy, the individual's belief that he or she can effectively perform the tasks and activities central to starting and running a venture (Chen, Greene, & Crick, 1998) to capture this set of skills, and study how it alters the nature of *CPD*'s effects on two distinct, yet related, aspects of the entrepreneurial process: opportunity recognition and innovative performance.

THEORY AND HYPOTHESES

Collaboration with a more diverse set of partners results in more diverse information accruing to the venture, widening the field of possibilities perceived by the venture. For instance, Hills, Lumpkin, and Singh (1997) find that entrepreneurs who have extended collaborations with others identify significantly more opportunities than entrepreneurs who go at it alone. Research additionally suggests that the combination of ideas coming from different, unrelated domains in particular leads to the generation of more, and more original, ideas (Mumford & Gustafson, 1988) such that ventures with more diverse combinations of partner types may recognize more opportunities (Gielnik, Frese, Graf, & Kampschulte, 2012). Indeed, even highly creative individuals have been shown to generate only standard and unoriginal solutions when perceiving information stemming from a single knowledge domain (Perttula & Sipilä, 2007). Research thus largely points towards positive effects of *CPD* on the opportunities that the entrepreneur

recognizes, as greater diversity yields more, more varied, and higher quality information and resources to the entrepreneur.

With regards to its innovative performance, the venture can derive a multitude of benefits from complementing their internal innovation efforts with the diverse resources and ideas obtained from different types of collaboration partners (Deeds & Rothaermel, 2003), aiding in the costly and complicated process of implementing and exploiting recognized opportunities. Ventures collaborating with a more diverse set of partners are able to source these lacking resources from a greater number of distinct areas of expertise and activities, thus aiding in the innovative process. Additionally, greater partner diversity enables the exploitation of complementarities and synergies within each individual collaborative activity, as well as between their partners (Belderbos, Carree, & Lokshin, 2006), further strengthening innovative performance compared to collaboration with more homogeneous partner types.

Hypothesis 1: Collaborative partner diversity has a positive relationship with opportunity recognition (H1a) and innovative performance (H1b).

However, diversity may also function as a double-edged sword. Every individual collaboration demands substantial interaction, monitoring, and controlling from the entrepreneur (Gulati & Singh, 1998) and these requirements become increasingly difficult to be met by the venture as *CPD* increases. High levels of *CPD* may additionally result in information overflows to the entrepreneur. When the venture collaborates with many diverse partners, excessively different opportunities or ideas may be obtained, making it difficult for the entrepreneur to select and implement these opportunities. Thus, if too many opportunities are recognized, only a limited number of them can be taken seriously and receive the needed attention (Koput, 1997). As such, *CPD* quickly depletes the entrepreneur's stock of cognitive and managerial capacity. Furthermore, increasing levels of *CPD* increase the risk of unobserved and unintended knowledge spillovers between partners (Combs & Ketchen, Jr., 1999) and may trigger learning races between different partner types in the venture's collaborative portfolio (Hamel, 1991). These escalating costs dampen the overall positive effects of *CPD* on both opportunity recognition and innovative performance. Though *CPD* may have an initially positive effect on opportunity recognition and innovative performance, the resource and attention limitations of the venture can eventually outweigh the benefits gained from collaborating with more diverse partner types, such that further increases in diversity slow down or even harm performance.

Hypothesis 2: The relationship between collaborative partner diversity and opportunity recognition (H2a) and innovative performance (H2b) exhibits negatively curvilinearity (i.e. diminishing returns or inverted U).

The traits and skills of the individual entrepreneur play a crucial role in shaping the venture's operations and performance in a small business context. Entrepreneurial self-efficacy, the individual's belief that he or she can effectively perform the tasks and activities central to starting and running a venture (Chen et al., 1998), in particular influences performance in a range of contexts (Zhao, Seibert, & Hills, 2005). Entrepreneurs with greater entrepreneurial self-efficacy may be better able to reap the various benefits from collaborative partner diversity, as they have more resources and ideas available to be supplemented, exploited, and complemented through collaborative efforts. Entrepreneurs with greater entrepreneurial self-efficacy are also

better able to perceive and process the information that diverse partners provide because of their greater cognitive capacity, making such entrepreneurs more likely to search proactively for opportunities (Gaglio & Katz, 2001) and to solicit opportunity-relevant information from others.

At the same time, focusing on the increasing costs of *CPD*, entrepreneurs with greater entrepreneurial self-efficacy can be expected to experience fewer cognitive limitations, having greater skills in different areas such as marketing, management, and financial control (Chen et al., 1998). In other words, entrepreneurs with higher levels of self-efficacy have greater stocks of cognitive capacity such that the rapidly accumulating information flows from *CPD* are less prone to deplete these stocks. Additionally, entrepreneurs with higher entrepreneurial self-efficacy may be better able to prevent knowledge spill-overs and learning races resulting from increasing *CPD*, as they are better able to convince others to share resources and ideas with them and amongst other partners (Wilson, Kickul, & Marlino, 2007). Jointly, the above reasoning implies that not only the benefits to collaborative partner diversity are strengthened with increasing entrepreneurial self-efficacy, but that the rapidly escalating costs are also weakened, resulting in weaker negative curvilinearity underlying the relationship.

Hypothesis 3a: Entrepreneurial self-efficacy weakens the negative curvilinearity between collaborative partner diversity and opportunity recognition (H3a) and innovative performance (H3b).

DATA AND METHODS

We distributed a questionnaire among ventures registered as belonging to the Dutch creative industries. In total, 3,460 respondents are included in our analyses. *Venture innovative performance* is measured as the percentage of annual turnover from new or significantly improved products and services new to the venture's market or new to the venture. For *opportunity recognition*, respondents were asked, using 7-point scales, to what extent they agreed with the statement that they saw opportunities in the upcoming two years in the areas of (1) products or services; (2) processes; (3) technologies; (4) customers or markets being targeted; (5) marketing or sales approaches; and (6) forms of collaboration.

We compute *collaborative partner diversity* as $CPD = 1 - \sum p_i^2$, where p_i is the percentage of time that the respondent invests in collaboration with partner type i . We identify five partner types: suppliers, customers/clients, competitors, intermediaries/agents, and other parties. *Entrepreneurial self-efficacy* was measured with a scale developed in Wilson *et al.* (2007). We do not include the original item "being creative", as pre-tests among practitioners indicated that this item was rather loaded in the creative industries. We control for whether or not the respondent is a *freelancer*, the respondent's *age*, *gender*, and level of *education*. Moreover, we control for *venture age* and industry group (the 'arts', 'media and entertainment', and 'creative business services'). We also control for if the venture is the respondent's *sole income source* and whether the respondent is a *creator* (versus, for example, being a distributor). Finally, we control for whether or not the respondent conducts *no collaborative activities* with any partner type. We estimate the following equations for this section of our analyses to test for our expected moderation of a curvilinear effect (Haans, Pieters, & He, 2016):

$$OPP = \beta_{0,1} + \beta_{1,1}CPD + \beta_{2,1}CPD^2 + \beta_{3,1}CPD*EFF \quad (1) \\ + \beta_{4,1}CPD^2*EFF + \beta_{5,1}EFF + \text{controls} + \varepsilon_1$$

$$\begin{aligned} \text{INNOV} = & \beta_{0,2} + \beta_{1,2}\text{CPD} + \beta_{2,2}\text{CPD}^2 + \beta_{3,2}\text{CPD}*\text{EFF} \quad (1) \\ & + \beta_{4,2}\text{CPD}^2*\text{EFF} + \beta_{5,2}\text{EFF} + \text{controls} + \varepsilon_2 \end{aligned}$$

where we allow the error terms of Equations 1 and 2 to covary to account for their related nature.

RESULTS

We first estimate a model wherein we include the effects of *CPD* and its square in both equations, in addition to our control variables. The coefficient of *CPD* on opportunity recognition is positive and significant while its square is negative and marginally significant, providing support for H1a and weak support for negative curvilinearity (H2a). Neither *CPD* nor *CPD*² is significant for the innovation-equation. We then include interactions between entrepreneurial self-efficacy and *CPD* and *CPD*². For both equations, a positive and significant interaction between entrepreneurial self-efficacy and *CPD*² emerges, in support of H3a and H3b.

Figure 1 provides a graphical illustration of these effects. Entrepreneurs with low levels of entrepreneurial self-efficacy face strongly negatively curvilinear relationships: though initial increases in *CPD* greatly increase opportunity recognition and innovative performance, these returns rapidly diminish as *CPD* continues to increase. Entrepreneurs with moderate levels of efficacy gain consistent, albeit modest returns to *CPD*, with the *CPD*-opportunity recognition relationship exhibiting weakly diminishing returns, and the *CPD*-innovative performance relationships being linear. Entrepreneurs with high levels of efficacy gain from *CPD* in a linear fashion when it comes to their opportunity recognition, whereas the *CPD*-innovative performance relationship turns into an exponentially positive one, with highly confident entrepreneurs reaping the greatest innovative performance from high levels of *CPD*, and only little from low diversity in their collaborative portfolio (statistically, the slopes on the decreasing part of the *CPD*-innovative performance curve are not different from zero for this group).

Figure 1 about here

DISCUSSION AND CONCLUSION

Our findings provide strong evidence that entrepreneur-level characteristics fundamentally alter the effect of collaborative portfolio diversity. Though entrepreneurs with low entrepreneurial self-efficacy face diminishing returns to the diversity of partner types with whom they collaborate, entrepreneurs with high levels of entrepreneurial self-efficacy face linear and even exponential returns to diversity on their levels opportunity recognition and innovative performance, respectively. These results have several implications to the innovation literature as well as entrepreneurship research. First, we provide an important extension of the concept of collaborative portfolio diversity. Though much work on portfolio diversity has been conducted among high-tech organizations, our findings clearly show that it has similarly strong effects and implications for small ventures in a widely different context. These findings are important, as the nature of activities of ventures in the creative industries differs substantially from those in high-tech industries, such as in their levels of capitalization, opportunities for economies of scale, and in the tangibility of their output. Future work thus stands to gain by consideration of alternative portfolio-level characteristics in a small business context.

Furthermore, our findings call for a further integration of innovation management with entrepreneurship research. Though the importance of such individual-level characteristics has long been recognized as a key aspect in understanding why, when, and how some people and not others discover and exploit opportunities, work exploring portfolio-level characteristics in the innovation literature has to date largely ignored the effects of such characteristics. Future work can gain valuable insights by investigating how the traits of decision makers can shape the organization's ability to benefit from diversity at the portfolio-level.

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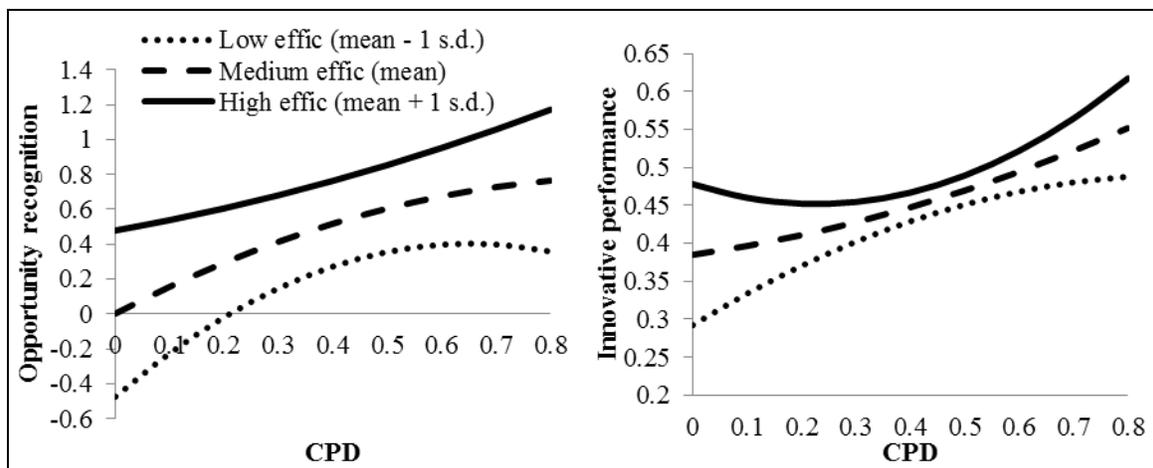


Figure 1. The relationship between *CPD* and opportunity recognition and innovative performance at different levels of entrepreneurial self-efficacy ('effic').