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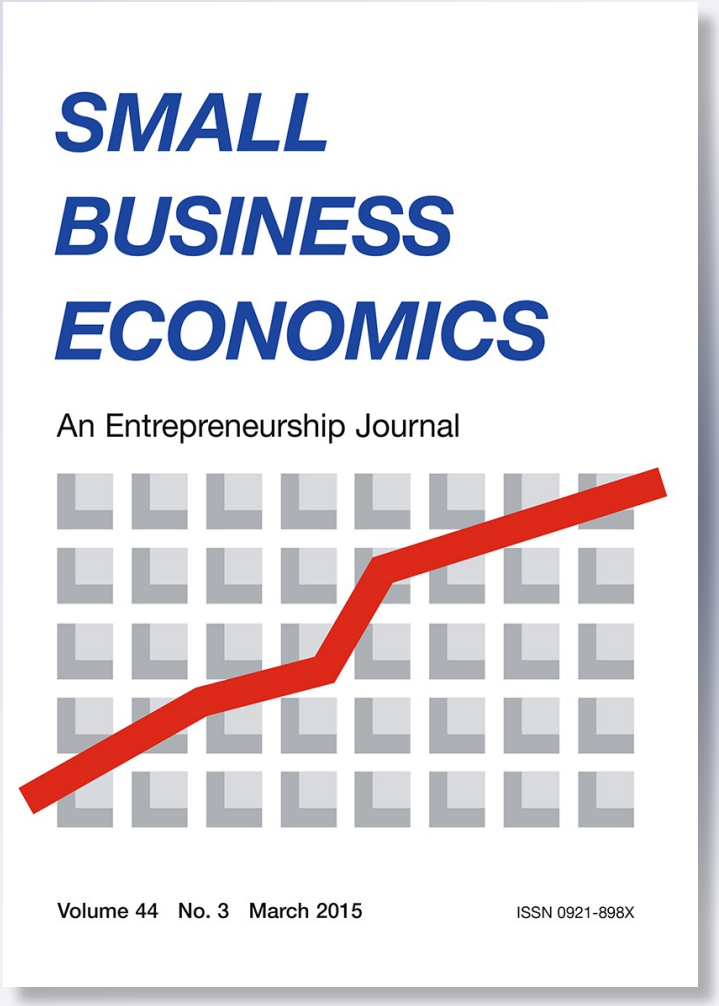

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Abstract Determinants of small-firm performance represent a central topic in the entrepreneurship literature. Addressing associations among personal traits, entrepreneurial orientation (EO), and small-firm performance, we develop a model to examine how an entrepreneur's creativity, self-efficacy, and EO affect small-firm performance. The hypotheses are tested on a sample of 256 French small-firm owners. The findings show that self-efficacy and EO are positively and directly associated with firm performance, whereas creativity and firm performance are fully mediated by EO. These findings offer important theoretical and practical implications.

Keywords Self-efficacy · Creativity · Entrepreneurial orientation · Firm performance · Mediation

JEL Classifications L25 · L26 · M12

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1 Introduction

Many studies focus on identifying the determinants of small-firm performance to help business owners enhance small-business growth (Rauch et al. 2009; Blackburn et al. 2013; Stam et al. 2013). Recurrent debates in the literature associate the personal traits of business owners (Baum and Locke 2004; Poon et al. 2006; Rauch and Frese 2007) with firm-level entrepreneurial orientation (EO) (Poon et al. 2006; Wiklund et al. 2009) and small-firm performance. EO refers to the process by which strategy-making policies and practices are used by firms to identify and launch new ventures (Miller 2011). Miller and Friesen (1982) contend that executive goals and traits are central to driving a firm's EO. Consistent with Hambrick and Mason's (1984) upper echelons perspective, which posits that CEOs are responsible for helping to set and direct the organization's strategic orientation, business owners have a major role in influencing the manifestation of EO (Rauch et al. 2009) through risk-taking, innovativeness, and a proactive orientation toward competition (Covin and Slevin 1988, 1989; Wales et al. 2013). In the present study and based on the Hambrick and Mason's (1984) upper echelons perspective, we interpret EO as the entrepreneur's orientation and not of the firm.

The significant expansion of interest regarding the determinants of small-firm performance indicates not only its importance but also the controversy that continues to surround firm performance mechanisms.

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Some studies posit that EO is more important than personal traits (Aldrich and Wiedenmayer 1993; Sandberg and Hofer 1987), whereas other researchers outline the central role of entrepreneurial traits in achieving small-firm performance (Baum and Locke 2004; Chakravarthy and Lorange 2008; Naffziger 1995; Sexton 2001). In the present study, we associate two entrepreneurial traits with EO to clarify their interrelated associations with small-firm performance.

In the literature, EO is considered as an entrepreneurial process promoted by business owners and triggered by their individual creativity and self-efficacy (Fillis and Rentschler 2010; Matthews 2007; Poon et al. 2006; Shane and Nicolaou 2014). According to Schumpeter (1934), the entrepreneur is a creative, driven individual who finds new combinations of factors of production to develop a new product, to corner a new market, or to design a new technology. Creativity is associated with general self-efficacy, which is defined as an entrepreneur's belief about his/her ability to reach designated levels of performance (Markman et al. 2002; Prabhu et al. 2008). Our model integrates these constructs to disentangle the mechanism of how personal traits (i.e., creativity and self-efficacy) exert an influence on EO and small-firm performance. Our research question reads as follows: *How do an entrepreneur's creativity, self-efficacy, and EO affect small-firm performance?*

The model is tested using a sample of 256 French small-firm owners and a partial least squares path modeling (PLSPM) approach. Our findings show that self-efficacy and EO are positively and directly associated with small-firm performance, whereas the relationship between creativity and firm performance is fully mediated by EO. These results suggest that entrepreneurs' beliefs regarding their capabilities contribute to firm growth (Baum et al. 2001; Baum and Locke 2004; Hmieleski and Baron 2008; Hmieleski and Corbett 2008) and that EO is an entrepreneurial process by which creative ideas are implemented within an organization, thus leading to firm performance (Ahlin et al. 2013; Fillis and Rentschler 2010; Matthews 2007; Ward 2004).

Our study makes four contributions to the entrepreneurship literature. *First*, by clarifying the associations between creativity, self-efficacy, EO, and small-firm performance, we address the call by Wales et al. (2013) to progress beyond simple discussions of entrepreneurial traits and focus instead on the implications of those traits for company outcomes. *Second*, our study expands the existing literature (Poon et al. 2006; Rauch et al. 2009; Wiklund 1999; Wiklund and Shepherd 2005; Wiklund et al. 2009) by identifying EO as an entrepreneurial process that not only is affected by creativity but also fully mediates the relationship between creativity and small-firm performance. Given the important role of EO in changing a company's strategic direction (Lumpkin and Dess 1996, 2001), the tendency of creative entrepreneurs to promote EO can be considered as a path to organizational success. *Third*, self-efficacy and performance are not mediated by EO, but are directly associated with it, which emphasizes the important role of entrepreneurs' beliefs in their ability to increase firm performance (Baum et al. 2001; Baum and Locke 2004; Hmieleski and Baron 2008; Hmieleski and Corbett 2008). *Fourth*, whereas the determinants of small-firm performance represent a broad field of interest (Blackburn et al. 2013; Stam et al. 2013; Wales et al. 2013; Wiklund et al. 2009), little consideration has been given to the association among entrepreneurial traits, EO, and small-firm performance using large samples of entrepreneurs (Poon et al. 2006). Our study provides a robust test of such an empirical model, investigating a sample of 256 French small-firm owners.

The paper is structured as follows: Section Two presents a comprehensive literature review, which leads to the formulation of four hypotheses regarding the association among the investigated constructs; Section Three explains the methodology applied to collect and analyze data; Section Four presents the results of the data analysis; and Section Five provides an interpretation of the findings, which leads to a series of theoretical and practical implications. Section Six emphasizes the study's main limitations and perspectives for future research. Section Seven concludes our study.

2 Literature review and research hypotheses

2.1 EO and small-firm performance

EO is a central concept in entrepreneurship research (Covin et al. 2006; Wiklund 1999). EO has its origins in the work of Mintzberg (1973) and Khandwalla (1977), who find that entrepreneurial firms take more

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risks and are more proactive in searching for new business opportunities. Building upon these empirical observations, Miller (1983) defines EO as a three-dimensional concept encompassing a firm's propensity to engage in innovative, proactive, and risk-taking actions. Further studies demonstrate the relevance of these dimensions to entrepreneurial success: By creating and introducing new products, services, and technologies, innovative firms can generate economic performance (Wiklund et al. 2009); by proactively implementing and launching these innovations, firms can develop and maintain their competitive advantage (Zahra and Covin 1995); and by taking bold and aggressive steps to exploit opportunities, firms can generate sustainable, long-term growth (Lumpkin and Dess 1996).

Although EO is considered a complex organizational-level process, in small firms it has a strong connection with individual behaviors: "The entrepreneurial orientation of a firm is demonstrated by the extent to which the top managers are inclined to take business-related risks (the risk-taking dimension), to favor change and innovation in order to obtain a competitive advantage for their firm (the innovation dimension), and to compete aggressively with other firms (the proactiveness dimension)" Covin and Slevin (1988, p. 218). EO is directly reflected in entrepreneur's strategy and has a direct impact on firm performance (Sapienza and Grimm 1997): "Entrepreneurial orientation may be viewed as the entrepreneurial strategy-making processes that key decision makers use to enact their firm's organizational purpose, sustain its vision, and create competitive advantage(s)" (Rauch et al. 2009, p. 763).

The conceptual and empirical arguments of previous research converge on the idea that small firms benefit from adopting an EO (Rauch et al. 2009). Wiklund (1999) suggests that striving to increase EO may be worthwhile for small firms because a positive relationship has been identified between EO and firm performance. Previous studies repeatedly and constantly demonstrate a positive relationship between EO and small-firm performance (Rauch et al. 2009; Schepers et al. 2013; Wiklund 1999; Wiklund and Shepherd 2005; Wiklund et al. 2009), and "there is reason to believe that EO as an overarching construct can have universally positive performance implications" (Wiklund et al. 2009, p. 354). Building upon these findings, we hypothesize as follows:

H1: EO is positively associated with small-firm performance.

2.2 General self-efficacy and small-firm performance

Studies agree that small-firm performance and organizational outcomes are affected by personal traits (Baum et al. 2001; Blackburn et al. 2013; Poon et al. 2006; Hambrick and Mason 1984; Wiklund et al. 2009). Self-efficacy is considered as a personal trait of entrepreneurs that affects small-firm performance (Poon et al. 2006). Self-efficacy is defined as the perceived personal ability to execute target behaviors (Krueger and Brazeal 1994) and to attain designated performance goals (Bandura 1986) by increasing optimism, perseverance and resilience (Ardichvili et al. 2003). Individuals with high-efficacy beliefs initiate and persist in their behaviors despite uncertainty and scarce resources (Trevelyan 2009), interpreting failures as learning experiences (Krueger and Brazeal 1994).

Self-efficacy can be assessed through both general traits (Schwarzer and Jerusalem 1995; Schwarzer et al. 1997) and entrepreneurial traits (Chen et al. 1998). General self-efficacy is considered as "a broad and stable sense of personal competence to deal effectively with a variety of stressful situations" (Luszczynska et al. 2005, p. 81). Entrepreneurial self-efficacy is defined as a person's belief in his/her ability to successfully launch an entrepreneurial venture (McGee et al. 2009). Entrepreneurial self-efficacy creates many problems because entrepreneurial activity includes a large number of potential tasks and associated skills: "From a purely pragmatic perspective, it is much easier to measure general self-efficacy than to explicitly capture the nuances of entrepreneurial self-efficacy" (McGee et al. 2009, p. 969). Entrepreneurial self-efficacy may also be biased by entrepreneurial knowledge levels (Føleide 2011). Nascent entrepreneurs have no direct entrepreneurial experience, which makes their evaluation of entrepreneurial self-efficacy highly questionable. Furthermore, experienced entrepreneurs may inflate their entrepreneurial self-efficacy scores because of past and/or present success. This can explain the conflicting results between entrepreneurial self-efficacy and firm performance, ranging from a positive relationship (Baum et al. 2001; Baum and Locke 2004; Hmieleski

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and Baron 2008; Hmieleski and Corbett 2008) to negative (Bandura and Jourden 1991; Stone 1994; Vancouver et al. 2002) or nonsignificant (Poon et al. 2006) relationships.

Considering these shortcomings, a general self-efficacy construct is considered to capture respondents' perceptions of their ability to address and solve challenging problems (Schwarzer and Jerusalem 1995; Schwarzer et al. 1997). Consistent with previous research (Chen et al. 2004; Markman et al. 2002; Poon et al. 2006), we adopt general self-efficacy as an appropriate personal trait to address firm performance. There is evidence that general self-efficacy induces a positive emotional drive, persistence, and resilience in the face of difficulties, leading entrepreneurs to reach designated performance goals (Bartol et al. 2001; Judge et al. 2007; Markman et al. 2002). Building upon these findings, we hypothesize as follows:

H2: General self-efficacy is positively associated with small-firm performance.

2.3 Creativity and small-firm performance

Entrepreneurial creativity is defined as the generation and implementation of novel, appropriate ideas to establish a new venture (Amabile 1997). Pretorius et al. (2005) outline that "creativity is clearly part and parcel of the entrepreneurial skills required to successfully start a venture" (p. 56). Although Amabile (1997) outlines that entrepreneurial creativity can be exhibited both in established organizations and in start-up firms, the definition fails to account for the role of creativity following the creation of a new venture (Fillis and Rentschler 2010). Other authors emphasize that creativity is fundamental for new venture competitiveness (Bridge et al. 2003; Carson et al. 1995; Kao 1989; Matthews 2007), with the entrepreneur having a central role in developing and maintaining a creative organizational culture (Ahlin et al. 2013; Cook 1998; Fillis 2002; Fillis and Rentschler 2006; Ward 2004).

Creativity and firm performance have received little attention in the literature (Gong et al. 2013; Weinzimmer et al. 2011). Most studies focus on individual (Elsbach and Hargadon 2006; Perry-Smith 2006) or team-level performance (Gilson et al. 2005; Vera and Crossan 2005). The existing empirical results indicate a positive association among creativity, firm performance (Von Nordenflycht 2007), and firm innovativeness (Baron and Tang 2011). Other studies assume a positive association among creativity, firm performance, and competitiveness (Baer and Oldham 2006; Gilson 2008; Mumford 2003; Zhou and Shalley 2008) without providing any empirical evidence. Building upon the perspective that creative entrepreneurs are instrumental in achieving performance in small firms (Ahlin et al. 2013; Fillis and Rentschler 2010; Matthews 2007; Ward 2004), we hypothesize as follows:

H3: Creativity is positively associated with small-firm performance.

2.4 The mediating role of EO

The mediating role of EO between self-efficacy and firm performance is suggested by Poon et al. (2006), who explains that entrepreneurs with high self-efficacy levels can deal with a variety of stressful situations and acquire necessary resources from the environment. These resources can then be allocated toward proactive and innovative projects that enable the firm to exploit rich opportunities and attain superior performance (Rosenbusch et al. 2013).

Similarly, Rosenbusch et al. (2013) suggest that EO mediates the relationship between creativity and firm performance. To explore and exploit new ideas, firms must adopt proactive and innovative strategies (Puhakka 2012). Because EO emphasizes innovativeness and proactivity and the exploration and exploitation of new products and processes (Lumpkin and Dess 1996), it is a legitimate response to increase the chances of attaining superior performance (Rosenbusch et al. 2013). The exploitation of ideas as a means of achieving high performance also entails risk. Thus, the risk-taking dimension of EO can also be argued to have a positive mediating effect (Rosenbusch et al. 2013). Based on the aforementioned results, we hypothesize as follows:

H4a: EO mediates the relationship between self-efficacy and small-firm performance.

H4b: EO mediates the relationship between creativity and small-firm performance.

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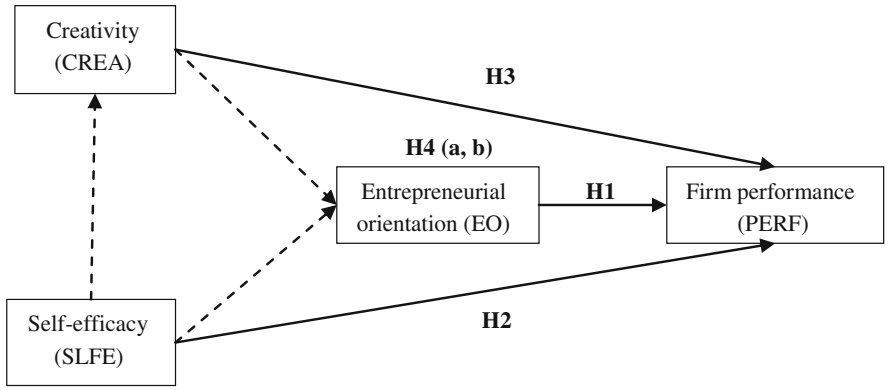

Fig. 1 Research model

2.5 Research model

The relationships expressed through the four formulated hypotheses are represented in our research model with continued associations (see Fig. 1). The dotted associations are not the focus of our research because they are extensively studied elsewhere in the entrepreneurship and management literature.

3 Methods

3.1 Data collection

Primary data were collected by a research team from the Amarok observatory between March 2011 and December 2012. Founded in January 2010, Amarok aimed to study the beliefs, attitudes, and behaviors of French small-business owners. During its development, Amarok partnered with the French mutual insurance company "Malakoff Mederic" and with the young leaders' network "Centre des Jeunes Dirigeants," which represents 3,500 business owners from various economic sectors.

An email invitation was sent to the 3,500 business owners, 334 of whom agreed to participate in a survey to be administered in March 2011. Twenty-eight participants abandoned the survey for various reasons (e.g., bankruptcy, time pressures, etc.), resulting in a sample of 306 participants. From this sample, 256 were selected for this study because they represented small businesses with fewer than 50 employees (European Commission 2003)[1]. These participants were then interviewed by Amarok's telephone operators, who used a structured questionnaire. The average duration of the telephone interaction with each respondent was approximately 20 min.

Table 1 Sample demographics

	Sample size ($n = 256$)	Mean (SD)
Size of the company (employees)		11.92 (11.44)
<10	139	3.92 (2.46)
≥10	117	21.43 (10.63)
Age (years)		44.05 (9.69)
<45	147	38.73 (4.21)
≥45	109	51.23 (5.07)
Gender		
Male	209	–
Female	47	–
Education level (years of study)		4.43(1.15)
<5	96	3.22 (0.99)
≥5	160	5.16 (0.36)
Experience (years)		11.26 (8.20)
≤10	156	6.12 (2.59)
>10	100	19.28 (7.50)

As shown in Table 1, 54 % of the firms from the sample employ less than ten employees, and 46 % employ more than ten employees (10–49 employees), with an average number of approximately 12 employees per firm. The average age of participants is approximately 44 years, and 81.6 % are male. One hundred and sixty of the surveyed entrepreneurs have

[1] See European Commission (2003).

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more than 5 years of education, and 100 have more than 10 years of experience.

Sample representativeness is assessed by comparing the distributions of age, gender, and education level to the population of French small businesses obtained from the National Institute of Statistics and Economics (INSEE 2012)[2]. The t tests are used to assess the null hypotheses that the means of two populations are equal (Hair et al. 2010). Results show that our sample is representative for the profile of entrepreneurs in French small businesses with respect to age, gender, and education level (t critical two-tail $> t$ stat). The t test results are reported in Appendix 1.

3.2 Measures

To ensure correspondence between the initial scales and the survey questions, all of the measures were translated into French by Amarok researchers and then translated back into English by an independent native speaker in an iterative process until all major differences in phrasing and meaning were eliminated. All of the item measures are reported in Appendix 2.

3.2.1 *Dependent construct*

Firm performance can be measured by objective and subjective measures. Objective measures are less prone to common method bias but are difficult to interpret in the context of new ventures (Stam and Elfring 2008). Subjective measures are commonly used and have been shown to exhibit strong reliability and validity (Dess and Robinson 1984). To measure firm performance (PERF), we used three subjective items reflecting growth and financial performance that we adapted from the entrepreneurship literature (Wiklund 1999; Wiklund et al. 2009). Respondents were asked to rate their financial profit, market value and sales volume using a scale ranging from 1 = "much worse" to 5 = "much better." Dillon–Goldstein's rho value ($\rho_{\text{PERF}} = 0.834$) is in excess of 0.7, indicating good reliability.[3]

3.2.2 *Independent constructs*

The EO concept has raised a series of debates in the literature regarding the nature of the concept (George 2011; George and Marino 2011). The meaning of the construct may be reflected in its dimensions (i.e., reflective construct) or created by them (i.e., formative construct). If EO is defined as a second-order reflective construct, the dimensions are expected to covary (George and Marino 2011). This does not mean that the dimensions cannot vary independently of each other. Rather, because EO is only represented by common variance under this definition, any variance due to factors other than EO will be attributed to error variance. Conversely, if EO is defined as a second-order formative construct, the dimensions can vary independently and may or may not covary. In our research, the dimensions vary independently representing a unique aspect of the EO construct, which has consistently been the case in empirical studies (Lumpkin and Dess 2001; Merz and Sauber 1995; Naldi et al. 2007). Accordingly, changes in the dimensions cause changes in the underlying construct and each dimension is considered a partial cause (MacCallum and Browne 1993; MacKenzie et al. 2005).

To measure EO, we employed Covin and Slevin's (1989) three sub-dimensions encompassing the entrepreneur's behaviors related to innovativeness (INN), risk-taking (RISK), and proactiveness (PRO). Each sub-dimension was measured using 3 items adapted from Covin and Slevin (1989). The respondents were asked to indicate the extent to which each item contained in the measure characterizes their entrepreneur's style, using a 7-point Likert-type scale. Following Lumpkin and Dess (2001), who noted that the original question employed by Covin and Slevin (1989)—i.e., whether an entrepreneur prefers to "undo the competitors" or to "live and let live"—measures competitive aggressiveness instead of proactiveness, we replaced this question with an item adapted from Lumpkin and Dess (2001), which asks whether an entrepreneur "has a tendency to follow up

[2] See INSEE (2012).

[3] According to Chin (1998), Dillon-Goldstein's rho (ρ) is considered a better indicator than Cronbach's alpha (α). Indeed, Cronbach assumes the so-called tau equivalence (or parallelity) of the manifest variables, i.e., each manifest variable is assumed to be equally important in defining the latent variable. Dillon–Goldstein's rho does not make this assumption because it is based on the results from the model (i.e., the loadings) rather than on the correlations observed between the manifest variables in the dataset (Vinzi et al. 2010). For further details about reliability, see Table 3.

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competitors" to adapt to the market, rather than anticipating it. Acknowledging the EO dimensionality debate (Lumpkin and Dess 2001), we factor-analyzed the items and found that they loaded above 0.60 on their corresponding constructs, with eigenvalues exceeding 1, as recommended by Hair et al. (2010). Dillon–Goldstein's rho (ρ) values ($\rho_{INN} = 0.865$, $\rho_{RISK} = 0.806$, $\rho_{PRO} = 0.833$) indicate good reliability.

Creativity (CREA) was measured using four items originally developed by Tierney et al. (1999). Respondents used a 7-point Likert scale ranging from 1 = "strongly disagree" to 7 = "strongly agree" to rate these items. Dillon–Goldstein's rho value ($\rho_{CREA} = 0.882$) indicates good reliability.

Self-efficacy (SLFE) was measured using the general self-efficacy scale (Schwarzer and Jerusalem 1995; Schwarzer et al. 1997). The general self-efficacy scale is composed of ten items that are largely used in psychology research to understand and measure self-beliefs (Schwarzer et al. 1997). Respondents used a 7-point Likert scale ranging from 1 = "strongly disagree" to 7 = "strongly agree" to rate these items. Dillon–Goldstein's rho value ($\rho_{SLFF} = 0.807$) indicates satisfactory reliability.

3.2.3 Control, moderating, and mediating variables

Previous studies suggest that smaller firms may face more severe challenges in exploiting opportunities because they operate in a competitive environment and have restrained human capital and small resource bases (Lumpkin and Dess 1996; Poon et al. 2006; Rauch et al. 2009; Wiklund 1999; Wiklund et al. 2009; Wiklund and Shepherd 2003, 2005). We therefore controlled for four variables measured as follows (Wiklund et al. 2009): size effect (including firm size and employee management problems); competition (the nature of competition in the market); human capital (including the entrepreneur's age, level of education, and experience); internal difficulties (including financial, sales, and administrative difficulties); and turnover (including the turnover generated by the largest customers and subcontractors as a proxy of available resources). To identify any potentially induced variance, we controlled for the moderating effects of firm size (<10 and ≥10 employees) and the entrepreneur's age (<45 and ≥45 years), level of education (<5 and ≥5 years of study), and experience (≤10 and >10 years). Moderators were converted into dichotomous variables by splitting the scale at the sample median, thereby defining two categories, which facilitates comparisons between groups with high and low measurement values (MacCallum et al. 2002). There is a general trend in entrepreneurship practice to label entrepreneurs as either having or not having a trait by comparing groups (e.g., young and old people, high and low levels of education and experience), which is often preliminary to understanding entrepreneurial behaviors (Kautonen et al. 2011; Schepers et al. 2013). If the dichotomization may lead to loss of information, the median split approach is suggested to be more appropriate than the thirds approach (upper 1/3 and lower 1/3 of groups) because it provides better statistical power (MacCallum et al. 2002; Royston et al. 2006). Finally, we tested the mediating effect of EO using the bootstrapping approach (Efron 1988; Hayes 2009).

3.3 Data transformation

As usual, missing values in the data provided by the 306 participants are due to data entry errors, forgotten data, data collection problems, or respondents' refusal to answer some questions (Hair et al. 2010). In the present study, all variables have levels of missing data of <10 %, which is considered acceptable (Hair et al. 2010).

Little's MCAR (missing completely at random) test was performed using the missing value analysis module of SPSS 20.0 and applying the expectation maximization (EM) method. The obtained significance level was 0.495 (chi square = 94.5, $df = 95$), indicating a nonsignificant difference between the observed missing data pattern in the reduced sample and a random pattern. This result allows the missing data process to be considered MCAR. The EM imputation method was then applied to replace MCAR data (Hair et al. 2010).

In the present study, all measurements were rescaled to a 7-point scale format using Dawes's (2008) method and the methodology suggested by Hair et al. (2010).

3.4 Data analysis

The data were analyzed using partial least squares path modeling (PLSPM version 2013.2.04), following the procedures suggested by Chin (1998). In comparison

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Table 2 PLS item factor loadings and cross-loadings

Retained items	Mean (SD)	CREA	INN	RISK	PRO	SLFE	PERF	SE	IDIF	COM	HC	TO
Creativity (CREA) (Reflective construct)												
1. I have confidence in my ability to solve problems creatively	5.887 (1.019)	0.776	0.161	0.144	0.168	0.267	0.094	0.036	−0.021	0.065	0.038	−0.133
2. I feel that I am good at generating novel ideas	5.805 (1.046)	0.855	0.196	0.207	0.257	0.272	−0.005	−0.024	0.059	0.050	−0.009	0.010
3. In general, I have tendency to first trying new approaches or methods in my work	5.395 (1.277)	0.782	0.260	0.197	0.237	0.204	0.085	−0.011	0.086	−0.049	−0.021	−0.027
4. I feel that I am a good role model for creativity	5.344 (1.114)	0.813	0.214	0.208	0.220	0.227	0.047	0.058	0.054	0.000	0.031	−0.029
Entrepreneurial orientation (EO) (Formative construct)												
Innovation dimension (INN) (reflective sub-dimension)												
1. I introduced and favored many product or service innovations in my company	4.848 (1.708)	0.241	0.874	0.448	0.296	0.056	0.147	−0.048	0.054	−0.027	0.019	0.009
2. I marketed very many new lines of products or services in my company	4.246 (1.711)	0.239	0.904	0.398	0.254	0.011	0.069	−0.059	0.122	−0.039	0.042	0.046
3. I made minor changes in product or service lines offered by my company [r]	4.488 (1.785)	0.144	0.685	0.200	0.308	0.045	0.112	−0.027	0.148	0.015	−0.064	0.076
Risk-taking dimension (RISK) (reflective sub-dimension)												
4. I tend to strongly favor high-risky projects (with chances of very high returns)	3.492 (1.693)	0.113	0.358	0.726	0.186	0.002	−0.009	−0.022	0.079	0.001	0.039	0.182
5. Owing to the nature of the environment, I favor bold and wide-ranging acts to achieve the company's objectives	3.797 (1.676)	0.171	0.269	0.827	0.213	0.100	0.070	0.124	0.121	−0.055	0.102	0.030
6. I typically adopt a bold and aggressive posture in order to maximize the probability of exploiting potential opportunities	5.094 (1.479)	0.240	0.382	0.731	0.364	0.133	0.151	−0.012	0.000	0.026	0.040	−0.091
Proactiveness dimension (PRO) (reflective sub-dimension)												
7. I am very seldom the first business to introduce new products/services, management techniques or operating technologies in my company [r]	4.520 (1.894)	0.228	0.319	0.309	0.827	0.115	0.127	0.008	0.007	−0.100	−0.123	0.003
8. I typically respond to actions which competitors initiate rather than preceding them [r]	5.234 (1.500)	0.155	0.134	0.097	0.692	0.123	0.089	−0.010	−0.044	0.039	−0.050	−0.066

Table 2 continued

Retained items	Mean (SD)	CREA	INN	RISK	PRO	SLFE	PERF	SE	IDIF	COM	HC	TO
9. I typically have a tendency to follow up competitors to adapt to the market rather than anticipating it [r]	5.012 (1.565)	0.244	0.301	0.323	0.845	0.170	0.092	−0.027	0.133	−0.076	0.033	0.025
Self-efficacy (SLFE) (reflective construct)												
1. It is easy for me to stick to my aims and accomplish my goals	4.633 (1.394)	0.221	0.035	0.115	0.137	0.661	0.228	0.073	0.036	0.063	0.022	−0.028
2. I am confident that I could deal efficiently with unexpected events	4.641 (1.368)	0.209	0.040	0.129	0.136	0.739	0.105	−0.005	−0.022	0.034	0.025	−0.085
3. Thanks to my resourcefulness, I know how to handle unforeseen situations	5.219 (1.125)	0.250	0.014	0.029	0.152	0.767	0.131	−0.106	0.053	−0.010	−0.094	−0.090
4. I can solve most problems if I invest the necessary effort	5.297 (1.162)	0.162	0.047	0.052	0.041	0.691	0.121	−0.036	0.012	−0.042	−0.031	−0.110
Firm performance (PERF) (reflective construct)												
1. This year, the financial profit of your firm was …	4.988 (1.674)	−0.048	−0.051	−0.043	−0.045	0.243	0.593	0.007	−0.194	0.082	−0.021	−0.156
2. Compared with the last year, the market value of your firm was …	4.508 (1.770)	0.089	0.087	0.108	0.107	0.151	0.837	0.007	0.020	−0.086	−0.032	−0.211
3. Compared with the last year, the sales volume of your firm was …	4.855 (1.679)	0.067	0.173	0.105	0.156	0.171	0.920	−0.057	−0.139	−0.073	−0.104	−0.178
Size effect (SE) (control variable)	–	0.020	−0.055	0.047	−0.012	−0.031	−0.031	1.000	0.085	0.015	−0.103	0.171
Internal difficulties (IDIF) (control variable)	–	0.054	0.124	0.087	0.059	0.032	−0.108	0.085	1.000	0.102	−0.091	0.055
Competition (COM) (control variable)	–	0.021	−0.024	−0.015	−0.078	0.018	−0.066	0.015	0.102	1.000	−0.037	−0.067
Human capital (HC) (control variable)	–	0.014	0.005	0.082	−0.057	−0.032	−0.079	−0.103	−0.091	−0.037	1.000	−0.053
Turnover (TO) (control variable)	–	−0.057	0.048	0.039	−0.002	−0.107	−0.221	0.171	0.055	−0.067	−0.053	1.000

[r] reversed scale, *CREA* creativity, *INN* innovation, *RISK* risk-taking, *PRO* proactiveness, *SLFE* self-efficacy, *PERF* firm performance, *SE* size effect, *IDIF* internal difficulties, *COM* competition, *HC* human capital, *TO* turnover

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Table 3 Discriminant validity

	Composite reliability (ρ)	Correlation of constructs[a]										
		CREA	INN	RISK	PRO	SLFE	PERF	ZE	IDIF	COM	HC	TO
CREA	0.882	**0.807**										
INN	0.865	0.257	**0.827**									
RISK	0.806	0.234	0.435	**0.763**								
PRO	0.833	0.273	0.341	0.338	**0.791**							
SLFE	0.807	0.301	0.045	0.111	0.171	**0.716**						
PERF	0.834	0.070	0.132	0.101	0.131	0.206	**0.795**					
SE	1.000	0.020	−0.055	0.047	−0.012	−0.031	−0.031	**n/a**				
IDIF	1.000	0.054	0.124	0.087	0.059	0.032	−0.108	0.085	**n/a**			
COM	1.000	0.021	−0.024	−0.015	−0.078	0.018	−0.066	0.015	0.102	**n/a**		
HC	1.000	0.014	0.005	0.082	−0.057	−0.032	−0.079	−0.103	−0.091	−0.037	**n/a**	
TO	1.000	−0.057	0.048	0.039	−0.002	−0.107	−0.221	0.171	0.055	−0.067	−0.053	**n/a**

[a] Diagonal elements are the square root of the AVE are in bold; *CREA* creativity, *INN* innovation, *RISK* risk-taking, *PRO* proactiveness, *SLFE* self-efficacy, *PERF* firm performance, *SE* size effect, *IDIF* internal difficulties, *COM* competition, *HC* human capital, *TO* turnover

with the structural equation modeling approach (SEM), PLS is appropriate for our study because it can address both reflective and formative constructs (Ringle et al. 2012). Using both formative and reflective constructs in SEM could lead to misidentification problems, inadmissible solutions, and factor indeterminacy (Fornell and Bookstein 1982).

The PLS approach is also appropriate for investigating complex relationships that combine mediating and moderating effects (Chin 1998; Fornell and Bookstein 1982); moreover, it processes both small and large samples more easily than SEM (Chin 1998).

4 Results

4.1 Testing the measurement model

We first assessed the psychometric properties of measurement scales for the first-order factors in terms of convergent validity, discriminant validity, and reliability using confirmatory factor analysis (CFA).

Measurement scales have a good *convergent validity* if the factor loadings of items on their corresponding constructs exceed 0.60, or if the average variance extracted (AVE) of the construct exceeds 0.50 (Hair et al. 2010). All of the items with factor loadings below the recommended threshold were dropped. The model was then re-examined without the eliminated items. The factor loadings are shown in Table 2, with all retained items exceeding 0.60 on their corresponding constructs, except the first item of PERF (0.593). However, because the average variance extracted (AVE) of the PERF construct exceeds the recommended threshold of 0.50 (i.e., 0.633), all measurement scales have adequate convergent validity (Hair et al. 2010).

To assess *discriminant validity*, we compared the square root of the average variance extracted (AVE) for every construct, with the intercorrelations obtained among these constructs (Chin 1998), where the square root of AVE should be greater than the intercorrelation estimates (Hair et al. 2010). The correlation matrix (Table 3) indicates that the square roots of AVE displayed on the diagonal are greater than the corresponding off-diagonal inter-construct correlations, providing good evidence of discriminant validity.

The *composite reliability* scores for reflective measurement scales exceed the recommended threshold of 0.70 (Hair et al. 2010), indicating good reliability among the retained items (see Table 3).

Finally, to address the *common method variance* (CMV) problem, we used Harman's (1976) one-factor test in an attempt to isolate the covariance due to artifactual reasons (Podsakoff and Organ 1986). The rule of thumb is that a single unrotated principal component should not explain more than the threshold level of 50 % of the variance, for all of the indicators

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measured with the same method. Our results show an explained variance of 21.551 %, indicating no CMV issues.

4.2 Testing the structural model

Because EO can be conceptualized as a second-order aggregate construct, we ran the full research model in PLS, disaggregating the EO's sub-dimensions. Following Vinzi et al.'s (2010) recommendations, the generated latent variable scores were then used as formative measures of the aggregate EO construct.

An important concern with formatively measured constructs is the level of multicollinearity across formative sub-dimensions (Diamantopoulos et al. 2008). We tested the formative construct for multicollinearity by calculating the variance inflation factor (VIF) values. As shown in Table 4, all VIF values are well below the threshold of 3.30 suggested by Diamantopoulos and Siguaw (2006), indicating no serious multicollinearity issues.

Another concern with formatively measured constructs is the weight significance of sub-dimensions (Diamantopoulos and Siguaw 2006). The weight is similar to the path coefficient and explains the effect of each dimension on the formative construct (Hair et al. 2010). Because content validity is affected by removing formative sub-dimensions, eliminating items from the pool should be theoretically justified rather than merely based on empirical results (Diamantopoulos et al. 2008). Because each of the nonsignificant sub-dimensions (i.e., INN and RISK) is a part of EO construct (see Table 5) and has significant bivariate correlation ($r_{INN} = 0.662$ and $r_{RISK} = 0.680$), we retained all sub-dimensions despite their nonsignificant weights (Diamantopoulos et al. 2008; George and Marino 2011). Rerunning the model with the nonsignificant dimensions removed yielded similar results as the model that included all sub-dimensions.

Once all sub-dimensions were validated, we tested our six hypotheses. Figure 2 shows the results of the model with joint controls (see Table 6 for details). As hypothesized, the relationships expressed by H1 ($\beta = 0.156$, $p < 0.05$) and H2 ($\beta = 0.172$, $p < 0.01$) are positive and significant, whereas H3 is not validated. The model explains 11.5 % (R^2) of the EO variance and 12.9 % of the performance variance (PERF). The goodness of fit of our model (GoF) is 0.229, which exceeds the cutoff value of 0.1 for small effect sizes of R^2, as suggested by Tenenhaus et al. (2005).

To test the model robustness with a better precision and stability (Hair et al. 2010), we *first* examined the separate direct effects of CREA, SLFE, and EO on PERF. The results show that the test does not affect the relationships: EO → PERF ($\beta = 0.158$, $p < 0.05$); CREA → PERF ($\beta = 0.070$, nonsignificant); SLFE → PERF ($\beta = 0.206$, $p < 0.001$). *Second*, we separately added the following: (1) the model's control variables: human capital (HC), size effect (SE), competition (COM), internal difficulties (IDIF), and turnover (TO); (2) the moderators: firm size, age, study, and experience; and (3) the interactions: SLFE*EO and CREA*EO (see Table 6). The results indicate that the model remains stable and

Table 4 Multicollinearity statistics

Statistics	EO sub-dimensions		
	INN	RISK	PRO
R^2	0.232	0.230	0.161
VIF = $(1/1 - R^2)$	1.302	1.299	1.192

INN innovation, *RISK* risk-taking, *PRO* proactiveness

Table 5 Weights for aggregate and formative constructs

Latent variable (constructs)	Manifest variables (dimensions)	Weights (*t* test)	Bivariate correlations (*t* test)
EO	INN	0.291 (1.427)	0.662*** (4.975)
	RISK	0.328 (1.627)	0.680*** (5.036)
	PRO	0.666*** (3.972)	0.877*** (7.733)

Values in parentheses represent *t* test

INN innovation, *RISK* risk-taking, *PRO* proactiveness

*** $p < 0.001$

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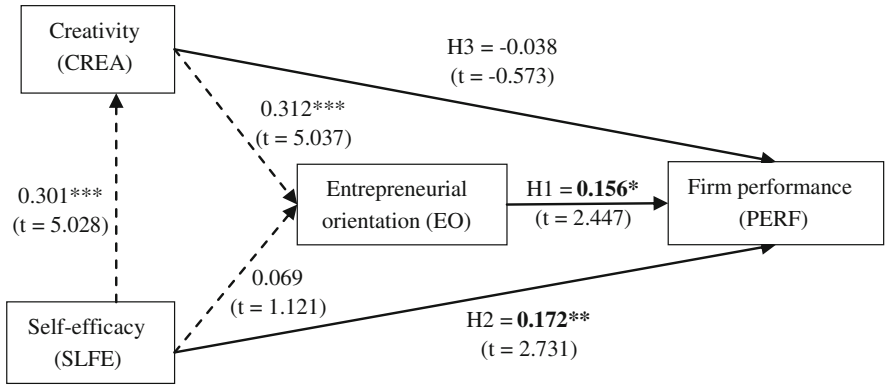

Fig. 2 PLS-standardized results

Note: ***p < 0.001; **p< 0.01; *p < 0.05

relationships are not affected by control variables and interactions and do not vary with moderators (size, age, study, and experience), with the exception that study (EO → PERF as the difference [$D = 0.350$] is significant at $p < 0.05$, which means that EO exhibits a high association with PERF at high educational levels). The joint introduction of all control variables in the same model does not affect the investigated relationships and inevitably improves the explained variance of PERF to $R^2 = 12.9$ %.

Third, we tested the mediation of EO using the bootstrapping approach (Efron 1988; Hayes 2009), as shown in Table 7. We examined whether it is possible, with 95 % confidence (Bootstrap = 100), that the true indirect effect would be zero (essentially, no mediation).

Bootstrap results for indirect effects indicate that EO does not mediate SLFE and PERF because the indirect effect is not significant ($\beta = 0.026$ lying in between −0.028 and 0.077, but 0 is a possible value between LB and UB); therefore, H4a is not validated. EO fully mediates CREA and PERF because the indirect effect is significant ($\beta = 0.06$, lying between 0.007 and 0.116, and 0 does not occur between LB and UB); consequently, H4b is validated.[4]

5 Discussion

The present study addresses the question of how an entrepreneur's creativity, self-efficacy, and EO affect small-firm performance. Although determinants of firm performance represent a broad field of interest (Blackburn et al. 2013; Stam et al. 2013; Wales et al. 2013), little consideration has been given to empirically examining associations among entrepreneurial traits (i.e., creativity and self-efficacy), EO (i.e., innovativeness, risk-taking, and proactiveness), and small-firm performance within large samples of entrepreneurs. We built our conceptualization on the fact that small-business entrepreneurs have a major role in influencing the manifestation of EO (Poon et al. 2006; Rauch et al. 2009). We find that self-efficacy and EO are positively and directly associated with small-firm performance (H1 and H2 are significant), whereas creativity and firm performance are fully mediated by EO (H4b is significant).

Our results challenge previous findings in the entrepreneurship literature. *First*, the significant association between EO and small-firm performance (H1) confirms that entrepreneurial processes play an important role in small-business growth (Rauch et al. 2009; Wiklund 1999; Wiklund et al. 2009). This significant association can be explained at individual level by the role of an entrepreneur's creativity as a foundation for innovativeness, risk-taking, and proactiveness (Ahlin et al. 2013; Ward 2004). From a theoretical perspective, our study provides additional empirical evidence that entrepreneurs with high level of EO may lead their firms to high levels of performance and growth.

Second, the significant association between self-efficacy and firm performance (H2) is an important contribution for the entrepreneurship literature because few studies find that the general self-efficacy of entrepreneurs affects their small-firm performance

[4] The nonsignificant direct relationship between CREA and PERF means that there is an indirect effect of CREA on PERF mediated by EO.

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Table 6 Controls and moderating effects

Standardized values (β)	EO → PERF	SLFE → PERF	CREA → PERF	→ PERF	R^2_{PERF} (%)
Base model of Fig. 2	0.138*	0.194**	−0.035		6
Model with separate controls ($n = 256$)					
Human capital (HC)	0.137*	0.191**	−0.033	−0.071	6.5
Size effect (SE)	0.138*	0.193**	−0.034	−0.023	6
Competition (COM)	0.134*	0.195**	−0.032	−0.060	6.3
Internal difficulties (IDIF)	0.151*	0.195**	−0.033	−0.128*	7.6
Turnover (TO)	0.150*	0.173**	−0.045	−0.209***	10.3
Model with moderating effects					
Firm size < 10 ($n = 139$)	0.200*	0.271**	−0.126		10.4
Firm size ≥ 10 ($n = 117$)	0.072	0.110	0.069		3.3
Difference (D)	0.128	0.161	0.195		
Age < 45 ($n = 147$)	0.204*	0.165*	−0.048		7
Age ≥ 45 ($n = 109$)	0.038	0.225*	0.013		5.9
Difference (D)	0.166	0.060	0.060		
Study < 5 ($n = 96$)	−0.091	0.192	0.066		4.9
Study ≥ 5 ($n = 160$)	0.258**	0.187*	−0.075		10.4
Difference (D)	0.350*	0.005	0.142		
Experience ≤ 10 ($n = 135$)	0.169*	0.218**	−0.043		8.2
Experience > 10 ($n = 121$)	0.062	0.147	0.026		3.4
Difference (D)	0.107	0.072	0.069		
Model with interaction effects					
SLFE*EO	0.144*	0.192**	−0.029	0.077	6.6
CREA*EO	0.139*	0.194**	−0.035	0.005	6
Model with joint controls					
Human capital (HC)	0.156*	0.172**	−0.038	−0.095	12.9
Size effect (SE)				0.015	
Competition (COM)				−0.064	
Internal difficulties (IDIF)				−0.119	
Turnover (TO)				−0.214***	

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; R^2_{PERF} represents the explained variance of firm performance; SLFE*EO, interaction between SLFE, EO, and PERF; CREA*EO, interaction between CREA, EO, and PERF; (D), the difference between two sample means at α level (0.05)

(Chandler and Jansen 1992). Our finding suggests that entrepreneurs' beliefs about their capabilities may contribute to reaching designated performance goals (Bartol et al. 2001; Judge et al. 2007). One of the ways in which self-efficacy affects performance is through conscientiousness (Judge et al. 2007).

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Table 7 Testing mediation using bootstrapping in PLS

Bootstrap results for indirect effects	Indirect effect (β)	Standard error (SE)	LB (95 %)	UB (95 %)
SLFE → PERF (EO) (H4a)	0.026	0.019	−0.028	0.077
CREA → PERF (EO) (H4b)	0.060	0.028	0.007	0.116

SLFE → PERF, from SLFE to PERF mediated by EO; CREA → PERF, from CREA to PERF mediated by EO; LB, lower bound of the confidence interval at the 95 %; UB, upper bound of the confidence interval at the 95 %

Conscientiousness leads entrepreneurs to set more ambitious goals and to be more dedicated to those goals (Chen et al. 1998).

Third, and interestingly, the nonsignificant association between creativity and small-firm performance (H3) is somewhat contrary to previous studies (Von Nordenflycht 2007). Nevertheless, this result seems to be coherent because creativity (i.e., the generation of new and useful ideas) is different from innovation (i.e., the successful implementation of ideas to achieve economic performance) (Ahlin et al. 2013). The generation of creative ideas cannot directly improve firm performance (Gong et al. 2013; Weinzimmer et al. 2011), but creative ideas should be developed, adapted and implemented within an organization to improve firm performance (Ahlin et al. 2013). The relationship between creativity and small-firm performance should be viewed as mediated by EO. Thus, creativity is indirectly associated with firm performance through increased innovativeness, risk-taking, and proactiveness (Ahlin et al. 2013; Ward 2004). This observation indicates that creativity is considered as a valuable 'raw material' that needs to be proactively refined and implemented through EO processes (Puhakka 2012).

Fourth, the fact that EO fully mediates creativity and firm performance (H4b) suggests that EO is a creative process by which entrepreneurs implement new ideas within their organizations, which leads to successful innovation and high performance (Ahlin et al. 2013; Fillis and Rentschler 2010). This finding provides an understanding of how entrepreneurial creativity influences small-firm performance. In their pursuit of "greatness," creative entrepreneurs push their firms to reach growth and success. However, the pursuit of growth by creative entrepreneurs requires an entrepreneurial process that leads to superior firm performance. EO fulfills this role (Wales et al. 2013). Through its emphasis on innovativeness, risk-taking, and proactiveness in the pursuit of new opportunities, EO enables the development and exploitation of creative ideas for small-firm growth (Covin et al. 2006). Although higher EO may also result in decreased performance, creative entrepreneurs are less concerned with this risk and therefore tend to lead firms that are more entrepreneurial (Wales et al. 2013).

From a practical perspective, our findings suggest important implications for entrepreneurs. According to our findings, creativity is a personal capacity that can and should be developed and nurtured (Ahlin et al. 2013). Although most entrepreneurs have limited free time, they must engage in activities that enhance their creativity (Ahlin et al. 2013; Ward 2004). Training can provide entrepreneurs with guidance on how to generate useful ideas, increase skills, accept changes, explore and exploit opportunities (Ahlin et al. 2013). Self-efficacy can also be enhanced through specific training methods and intervention strategies (Gist 1989). For instance, behavioral modeling (i.e., watching others) may provide information about abilities because "people partly judge their capabilities in comparison with others" (Bandura 1988, p. 143). Modeling appears to be a particularly effective means of providing information about "correct" performance strategies because this information may not be available otherwise (Gist and Mitchell 1992). The information cues method is another training approach (Bandura and Cervone 1986), which includes feedback or instructions about personal abilities, providing information about the amount of effort that an entrepreneur should invest to solve a problem and/or to generate useful ideas.

6 Limitations and future research

The present study has a number of limitations that must be addressed in future research. *First*, although a substantial amount of the variance in performance is explained by creativity, self-efficacy, and EO in the model ($R^2 = 12.9$ %), explanatory power and overall goodness of fit could be improved. Many antecedent factors of performance were not included in our model. For instance, personal traits such as the internal locus of control (Ahmed 1985) and achievement

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motivation (Poon et al. 2006) have been shown to be associated with EO and performance. Similarly, it has been suggested that market dynamism and hostility influence small-business performance (Wiklund et al. 2009). Future studies should attempt to replicate our model and to introduce other personal traits to improve the explicative power of performance.

Second, in the present study, and consistent with past research practices, firm performance is assessed using subjective self-reported measures (Dess and Robinson 1984). Although subjective performance measures exhibit strong reliability and validity, objective performance measures are less prone to common method bias (Stam and Elfring 2008). Further research is required to reduce bias and to capture the multidimensionality of firm performance by combining objective and subjective measures (Wiklund and Shepherd 2005).

Third, self-efficacy is assessed applying the general self-efficacy scale commonly used in psychology research (Schwarzer and Jerusalem 1995; Schwarzer et al. 1997). Despite the high reliability of the self-efficacy measure ($\rho_{SLFF} = 0.807$), retaining only four items that exceed the recommended threshold of factor loadings (Hair et al. 2010) from the initial scale comprising ten items may lead to some bias. To address this issue, additional research is needed to assess self-efficacy using a more complete entrepreneurial scale (Chen et al. 1998).

Fourth, association is meant to describe relations that can occur more often either together or not together (Holland 1986). Using the association approach, self-efficacy and firm performance can alternatively be explained by the phenomenon of reverse causation (Bartol et al. 2001). In a successful business, self-efficacy represents an emotional drive that provides entrepreneurs with self-confidence in their abilities to achieve performance goals and growth (Chandler and Jansen 1992). To overcome this issue, longitudinal studies are needed to prevent cross-sectional data and to increase our knowledge concerning potential associations and causations between investigated variables (Holland 1986).

Fifth, although our measurement strategy is unlikely to suffer from common method biases, more research is warranted (Podsakoff et al. 2003). A data collection instrument that uses only self-reported measures may lead to bias, especially when data are collected at the same point in time. To overcome this issue, future research should collate different measures spaced over time, or use separate primary and secondary observations (Podsakoff and Organ 1986).

7 Conclusion

Using a sample of 256 French small-business owners our model deals with the interplay between an entrepreneur's creativity, self-efficacy, entrepreneurial orientation (EO), and small-firm performance. Our findings provide useful insights for both academic researchers and practitioners. It shows the mediating role of EO between creativity and small-firm performance while creativity has no direct effect on firm performance. This means that creativity can be considered as a "raw material" that contributes to firm performance only in case the entrepreneur shows a sufficiently high level of EO. Self-efficacy and performance are not mediated by EO, but self-efficacy has a direct association with firm performance. In other words: Even when controlled for creativity and self-efficacy, EO has a direct association with small-firm performance. Our results provide entrepreneurs with useful insights to enhance their small-firm's performance. Entrepreneurs should promote their EO by encouraging innovation, risk-taking, and proactiveness to enable the exploration and exploitation of creative ideas. Moreover, entrepreneurs should believe in their capabilities of building, which contributes to reach designated performance goals. Further research is needed to progress beyond simple discussions of entrepreneurial traits and focus instead on the implications of those traits for company outcomes.

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Appendix 1

See Table 8.

Table 8 *t* test: two-sample assuming unequal variance

	Variable 1 Our study	Variable 2 INSEE's study
Distributions of age according de gender		
Mean male (<45 year)	38.75	33.51
Mean female (<45 year)	38.67	32.69

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Table 8 continued

	Variable 1 Our study	Variable 2 INSEE's study
Mean male (≥45 year)	51.33	53.47
Mean female (≥45 year)	50.80	51.28
Mean	44.06	39.71
Variance	1,563.99	644.46
Samples	2	2
Hypothesized mean difference	0	
df	2	
t Stat	0.13	
$p(T \leq t)$ one-tail	0.45	
t Critical one-tail	2.92	
$p(T \leq t)$ two-tail	0.91	
t Critical two-tail	4.30	
Distributions of education level according to gender		
Male (<5 years)	3.31	2.06
Female (<5 years)	3.31	2.28
Male (≥5 years)	5.15	5.53
Female (≥5 years)	5.16	5.79
Mean	4.48	3.30
Variance	15.82	2.37
Samples	2	2
Hypothesized mean difference	0	
df	1	
t Stat	0.39	
$p(T \leq t)$ one-tail	0.38	
t Critical one-tail	6.31	
$p(T \leq t)$ two-tail	0.76	
t Critical two-tail	12.71	

The *t* critical two-tail > *t* stat (the means of two populations are equal)

Appendix 2

See Table 9.

Table 9 Item measures

Performance (PERF) Adapted from the works of Wiklund (1999) and Wiklund et al. (2009)	(1) This year, the financial profit of your firm was…; (2) Compared with the last year, the market value of your firm was…; (3) Compared with the last year, the sales volume of your firm was…
Entrepreneurial orientation (EO) The first eight items were adapted from the work of Covin and Slevin (1989), and item nine (9) was adapted from Lumpkin and Dess (2001)	The innovation (INN) sub-dimension was measured using three questions: In the past 3 years, (1) I introduced and favored many product or service innovations in my company; (2) I marketed very many new lines of products or services in my company; (3) I made minor changes in product or service lines offered by my company [reversed scale] The risk-taking (RISK) sub-dimension was measured using three questions: (4) I tend to strongly favor high-risk projects (with chances of very high returns); (5) Owing to the nature of the environment, I favor bold and wide-ranging acts to achieve the company's objectives; (6) I typically adopt a bold and aggressive posture in order to maximize the probability of exploiting potential opportunities The proactiveness (PRO) sub-dimension was measured using three questions: (7) I am very seldom the first business to introduce new products/services, management techniques or operating technologies in my company [reversed scale]; (8) I typically respond to actions which competitors initiate rather than preceding them [reversed scale]; (9) I typically have a tendency to follow competitors to adapt to the market rather than anticipating them [reversed scale]

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Table 9 continued

Creativity (CREA) (Tierney et al. 1999)	(1) I have confidence in my ability to solve problems creatively; (2) I feel that I am good at generating novel ideas; (3) In general, I have a tendency to first trying new approaches or methods in my work; (4) I feel that I am good role model for creativity
Self-efficacy (SLFE) (Schwarzer et al. 1997)	(1) I can always manage to solve difficult problems if I try hard enough; (2) If someone opposes me, I can find means and ways to get what I want; (3) It is easy for me to stick to my aims and accomplish my goals; (4) I am confident that I could deal efficiently with unexpected events; (5) Thanks to my resourcefulness, I know how to handle unforeseen situations; (6) I can solve most problems if I invest the necessary effort; (7) I can remain calm when facing difficulties because I can rely on my coping abilities; (8) When I am confronted with a problem, I can usually find several solutions; (9) If I am in a bind, I can usually think of something to do; (10) No matter what comes my way, I'm usually able to handle it

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