Eurasian Bus Rev (2017) 7:161–182
DOI 10.1007/s40821-016-0068-y

S.S.: INTERNATIONAL MARKETS

Degree of innovation and the entrepreneurs' intention to create value: a comparative study of experienced and novice entrepreneurs

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Received: 19 August 2016 / Revised: 9 November 2016 / Accepted: 14 November 2016 /
Published online: 21 December 2016

Abstract A vital aspect of entrepreneurial action is the translation of entrepreneur's opportunity into new value creation. This paper examines the moderating roles of the founder's experience and innovation degree on the relationship between opportunity confidence and new value creation intention (NVCI) at the pre-founding stage of a business. For this purpose, it uses survey data from 157 prospective entrepreneurs in the ICT industry from university incubators in Iran. Using SEM, we find that experience, alone, does not moderate the relationship between opportunity confidence and NVCI. However, if entrepreneurs have required opportunity confidence, then medium and high-level innovation can increase the likelihood of acting on the opportunity for novice and experienced entrepreneurs, respectively. For novice entrepreneurs, the innovation variance from low to medium moderates the relationship between opportunity confidence and intent. In fact, this relationship is strengthened by the medium novelty level. Whereas, for experienced entrepreneurs, the variance from medium to high, moderates the relationship that is strengthened by the high novelty level.

Keywords Entrepreneurial intention · Entrepreneurial expertise · Innovation degree · Opportunity confidence

JELClassifications L26 · N75 · Q31

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1 Introduction

Entrepreneurship is a costly and uncertain activity. Even when an entrepreneur perceives an opportunity, there is always a lingering doubt as to whether s/he could successfully exploit it. As McMullen and Shepherd point out, "uncertainty prevents action by obfuscating the need or possibility for action, the knowledge of what to do, and whether the potential reward of action is worth the potential cost" (2006: p. 139).

Before any risky action, there must be an *intention* to execute the action. It is the best predictor of planned behavior, underpinned by the perceived desirability and feasibility of the expected outcomes (Ajzen 1991; Krueger et al. 2000). The opportunity evaluation process involves an assessment of two important personal beliefs that pertain to prospective action, namely the desirability and feasibility of the prospective action (Grégoire and Shepherd 2012; Haynie et al. 2009), which underpin the entrepreneur's opportunity confidence (Davidsson 2015; Dimov 2010).

Although many studies have addressed the mechanisms through which knowledge contributes to entrepreneurial opportunity recognition (e.g., Buenstorf 2007; Choi and Shepherd 2004; Khajeheian 2013; Siegel and Renko 2012), limited attention has been devoted to the ensuing intention to create new value (product). This paper seeks to fill this gap by focusing on how the formation of such intention is affected by entrepreneurial experience and the innovativeness of the opportunity at hand.

There is growing recognition of heterogeneity among entrepreneurs and variation in business ownership experience as one of the paramount predictors of such heterogeneity (Ucbasaran et al. 2009). Indeed, expertise is an important factor in entrepreneurial behavior (Baron 2009). Experts and novices differ in their mental representations of particular problems, and such differences suggest different abilities to develop new knowledge connections (Glaser and Chi 1988; Dimov 2007) and thus to make novel interpretations.

The challenges of young firms in marketing their innovative products have been well documented in entrepreneurship research (e.g., lack of experience, financial resources, limited networks, market resources, and legitimacy). However, the unit of analysis has been often at the firm level. Little is known about how human capital at the individual level (e.g., the experience of founders) impacts behavioral beliefs in forming intention. The impact of the innovation degree helps the NVCI model to be more realistic and comprehensive since it also incorporates the perception of competition in the intention equation.

The unit of analysis is individual entrepreneurs who are at the *conception* stage of starting their business (see Reynolds et al. 2000). We have focused on the ICT industry (information and communications technology) for our target population and contacted entrepreneurs associated with science and technology parks (STPs) from sixteen provinces in Iran. The data were collected in two successive phases. The first phase focused on the intention model and the second on the degree of innovation. We used the structural equations modeling (SEM) to analyze the data.

The article contributes to the existing literature on entrepreneurial intentions and innovation in three ways. First, it highlights new value creation intention (NVCI) as an important state of the entrepreneurial process and establishes opportunity confidence as its antecedent. Second, it articulates the contingent effect of entrepreneurial expertise in the formation of NVCI. Third, it elaborates on the interplay between the degree of product/service innovation and entrepreneurial experience in the formation of NVCI. Besides these theoretical contributions, the findings have important implications for policymakers and market practitioners as well as investors in developing countries like Iran in allocating their scares resources to entrepreneurial projects.

2 Theory and hypotheses

2.1 Opportunity confidence and value creation intention

Entrepreneurship is manifested in action (Foss and Klein 2012; McMullen and Dimov 2013), and entrepreneurial actions mirror the intention of the entrepreneurs (Mcmullen and Shepherd 2006). Entrepreneurial intention involves a willingness to make decisions and act independently and creatively (Kolvereid 1996). Therefore, it can predict subsequent behavior aimed at creating new value (Liñán and Chen 2009). A large body of empirical studies, from various behavioral areas, has pointed out that intention is a good predictor of subsequent action (Kibler 2012).

Acting on a particular opportunity requires an intention to create value for the prospective customers. Therefore, to understand the formation of such value-creation intention, we need to consider the configuration of beliefs and desires in the context of its inherent uncertainty (Dimov 2007). Accordingly, belief in the ability to create a new value is regarded as the amount of uncertainty an entrepreneur perceives, while desire is the willingness to bear this uncertainty (McMullen and Shepherd 2006). Perceived desirability and self-efficacy are two behavioral beliefs about handling the belief–desire configuration at the time of intention formation.

Attitude or perceived desirability refers to the belief in which an individual judges behavior desirable or undesirable, to perform specific actions with respect to an object or target (Ajzen and Fishbein 2005). It refers to the belief about the expected value for the individuals. Self-efficacy focuses on the belief that one can implement the required behavior (Gist 1987). To have the ability to perform an action, an individual must have ingenuity, skills and sub-skills, energy, and control over the task.

Self-efficacy has been portrayed as a distinct characteristic of entrepreneurs, without any association to a particular opportunity (Dimov 2010: p. 1128). However, when viewed in the context of a particular task, self-efficacy beliefs can be placed on a continuum, in regard to their particularity to the task (Bandura 1977). Self-efficacy can range from general, distal, trait-like beliefs in one's ability to perform successfully (Chen et al. 2001) to more intermediate beliefs that apply to a range of similar tasks, such as job self-efficacy, creative self-efficacy (Tierney and Farmer 2002), and entrepreneurial self-efficacy (Chen et al. 2001), and even to more

proximate, state, task-specific beliefs such as opportunity-related or value creation self-efficacy (Dimov 2010).

Opportunity confidence is a new concept in the opportunity evaluation literature which was introduced by Dimov (2010), in the context of nascent entrepreneurs and start-up efforts. It pertains to two behavioral beliefs about a new idea at hand, namely feasibility and desirability (Grégoire and Shepherd 2012; Haynie et al. 2009; Wood and McKelvie 2015). However, as the relationship between the opportunity confidence and intention to create value has not been examined before (see Fig. 1), we offer the following hypothesis:

Hypothesis 1. *Opportunity confidence is positively related to the new value creation intention.*

2.2 Entrepreneurial experience

Variation in business ownership experience is one of the factors underlying the heterogeneity among entrepreneurs (Ucbasaran et al. 2009). Indeed, prior experience is an important construct in entrepreneurial behavior (Baron 2009) and has informed many discussions related to entrepreneurship phenomena such as risk and opportunity (Dimov 2007; Shane 2000). Experts and novices differ in their mental representations of particular problems, and such differences suggest different abilities to develop new knowledge connections (Dimov 2007; Glaser and Chi 1988) and thus to make novel interpretations. In particular, experts encode and process information in a more abstract, complex way than novices (Dimov 2007; Gitomer 1988).

Surprisingly, there have been contradictory results in the relationship between experience and intention (Miralles et al. 2015). For example, Kautonen et al. (2011) did not find support for the impact of work experience in public sector or small businesses on subsequent entrepreneurial intention. Kuckertz and Wagner (2010) found that business experience weakens the positive relationship between sustainability orientation and entrepreneurial intention. Nevertheless, Krueger and Carsrud (1993) argues that the prior entrepreneurial experience improves the perception of new venture feasibility and desirability. Experience as an important aspect of entrepreneurs' human capital may be more or less effective at different stages of entrepreneurship process (Davidsson and Honig 2003). We, therefore, expect that

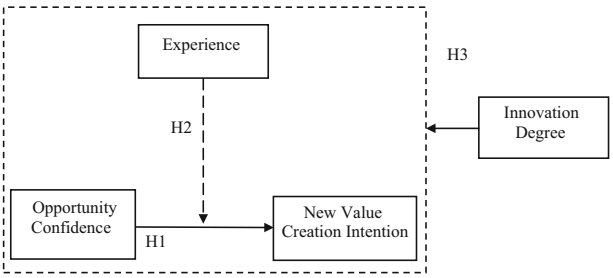

Fig. 1 Research model showing the three-way interaction

the relationship between opportunity confidence and NVCI will be stronger for more experienced entrepreneurs.

Hypothesis 2. *Entrepreneurial experience positively moderates the relationship between opportunity confidence and NVCI.*

2.3 Product innovation and entrepreneurial experience

Innovation allows companies to stay competitive (Khajeheian 2016). However, it is a broad concept. It can include technological innovation, product innovation, or innovation in the manufacturing process (Brouwer and Kleinknecht 1999) to reduce the production cost. Some scholars consider innovation as a project to develop a new product and distinguish it from the manufacturing process (Christensen 2000). Only a single change in a product might lead to an innovative offering which may need customization of much of the manufacturing process (Christensen 1997). A broad definition of innovation suggests: "any idea, practice, or product that is perceived as new by the potential unit of adoption" (Zaltman et al. 1973: p. 50).

The innovation process starts from the idea phase and continues with the search for funding, development, implementation, and post-launch development (Christensen 2000). Each project begins with an idea which arises at a certain time and in a particular place. The idea for a product innovation incorporates some sort of technical solution to a current or potential future market need. 'Idea generation' refers to what happens when someone has an idea or discovers a forgotten idea and identifies it as a potentially viable economic proposition (Christensen 2000: p. 73).

In entrepreneurship, the terms *opportunity*, *information* (new vs. existing), and *new venture creation* typically refer to the provision of a new value or entrepreneurial rent (e.g., Shane 2001; Siegel and Renko 2012). Kirzner (1973) and Schumpeter (1934) disagree over the modes of accessing new information for the creation of the new entrepreneurial value (Shane 2003; Siegel and Renko 2012). For Kirzner (1973, 1979), it is about unequal access to existing information for creating value. Conversely, Schumpeter (1934) argues it is the role of the new information (degree of innovation) that underpins the creation of new value. Few studies have distinguished the different types of knowledge that lead to recognition, discovery or creation of opportunity. For example, Buenstorf (2007) concludes that only new knowledge creates opportunities. Also, Siegel and Renko (2012) used a different type of knowledge—new technology knowledge and idiosyncratic knowledge—to investigate their separate and combined effects on opportunity recognition.

Although the degree of innovation is often subsumed under the broader notion of value creation, for the purpose of this study we seek to examine it separately and thus treat it as an exogenous factor to value creation. At the same time, the intention to create value might weaken, strengthen, or remain unchanged during the opportunity evaluation phase (McMullen and Dimov 2013).

The more innovative a product/service is, the more complexity and the less risk of imitation by rivals there will be. These can be motivating factors for entrepreneurs to exploit opportunities. However, the degree of innovation also

decreases the rate of adoption (Rogers 2003) because the increase in novelty-seeking imply bearing more risk and uncertainty (Wärneryd 1988; Wolff 2007), and they require the development of new capabilities and new relations (Carayannopoulos 2009). Furthermore, the more novel the new value is, the higher will be the proportion of resources to be allocated to innovation. However, small firms—especially at the early stage of their life- cannot devote much resources to innovation (Rosenbusch et al. 2010). At the same time, such firms can be led by both experienced or novice entrepreneurs. Ucbasaran et al. (2009) found that experienced entrepreneurs identified more opportunities and exploited more innovative opportunities with greater wealth creation potential. Krueger (2009) argues that novice entrepreneurs may hold beliefs that are incorrect or simply limited concerning their mental prototype of opportunity intention.

Therefore, we pose the question of whether the degree of innovation affects the likelihood of acting on an opportunity insight (i.e. through the intention to create value) between experienced or novice entrepreneurs.

Hypothesis 3. *Each range of innovation (low, mid, and high), moderates the relationship between opportunity confidence and NVCI differently for experienced and novice entrepreneurs.*

2.4 Innovation degree

Despite extensive research on innovation, there have been relatively few attempts to derive taxonomies of the degree of innovation. Abernathy and Clark (1988) introduced two dichotomies of incremental and radical as disruptive technologies. However, as this classification does not incorporate the mid-range innovations, it provides limited insights (Henderson and Clark 1990). Henderson and Clark (1990) offered two components of the product knowledge as a basis for classifying innovation; namely modular and architectural to describe further four types of innovation levels. Modular knowledge refers to the knowledge of the underlying components, while architectural knowledge refers to how the components are linked or work together. Table 1 summarizes these four types of product innovation.

Kahn (2006) introduced seven different types of new products, including cost reductions, product improvements, line extensions, new markets, new uses, new category entries, and new-to-the-world products. We have adapted seven ranges of product innovation adapted from Kahn (2006) and Henderson and Clark (1990) for the purpose of this study. This new taxonomy offers the flexibility of choices for the

Table 1 Comparison of radical, architectural, modular, and incremental innovations. Source: Carayannopoulos (2009)

	Module challenged	Module unchallenged
Architecture challenged	Radical innovation (e.g., calculator compared with slide rule)	Architectural innovation (e.g., desktop computers compared with IBM mainframes)
Architecture unchallenged	Modular innovation (e.g., digital camera compared with film camera)	Incremental innovation (e.g., image stabilizing feature added to digital cameras)

respondents in the research instrument and also simplifies the classification of innovations across low, middle, and high ranges. Moreover, Kahn's classification does not completely denote ordinal hierarchy among the seven categories whereas Henerson and Clark's carry the ordinal hierarchy property.

Seven classes of product innovation—according to the level of newness—were adapted as the measurements. Hence, as pointed above, innovation degrees in this study cover all the four categories of innovation. It should be noted that product innovation here only pertains to the core component of a product (the core locus) not the peripheral components, such as detachable accessories. The more the degree of newness increases, the more the complexity and uncertainty surrounding the product's production and commercialization will increase. Furthermore, the term *innovation* is used rather than "invention" or "discovery", because it has a broader definition than the latter. Innovation implies that a novel item has found, or will eventually find, a place in the commercial market. While invention is only related to engineering and design, innovations need to be designed and engineered to be commercially viable (Pech 2016: p. 5).

The first group refers to a *zero newness* level. Products in this group are almost the same as current product offerings in the market (without any extra novelty). However, they are offered in a new market that has not met the product before or in niches. For example, despite a huge market for online booking services for vacation rental properties, no company currently offers them in Iran. Therefore, even setting up a business that delivers exactly the same services—as existing firms such as *Airbnb*, *HomeAway,* etc. do—can generate substantial revenues for the initiator/s and excellent new value for customers in the country.

The second group refers to *compatibility*. The products in this group are only slightly different from the existing products but have significant compatibility—in use—with the state-of-the-art technology or current complementary products in the market that benefit consumers a lot however without a significant reduction in the cost for customers. This product can also be a revised version of a current product, provided by the home producer or a third party. A case in point is Microsoft Windows Vista and 7 where the latter mainly had a significant improvement in compatibility than the former version.

The third group refers to *cost reductions* or *cost advantages* which are not dramatic changes to the existing products, but changes in some attributes that can significantly influence the consumer buying behavior due to price reduction (Kahn 2006). This group can also preserve the compatibility nature of the previous group. For example, in computer software, this can be mostly due to improvement in the programing language or production process which can have a direct or indirect effect on the final price for customers. Another example is the improvement in DVD (digital versatile disc) technology. The dual-layer recording allows DVD-R and DVD + R discs to store significantly more data—up to 8.5 gigabytes per disc, compared with 4.7 gigabytes for single-layer DVD discs which lead to a notable cost reduction for the customer. Almost in none of the three previous categories, the knowledge about the components and the linkage between them have large alterations to the existing products or services.

The fourth group refers to *product improvements*. They are product enhancements that promote the product's function and are often identified as "new and improved" or "better flavor" (Kahn 2006). In this group of innovation, the fundamental knowledge of how the product performs its intended job and the core design concepts are left largely unchanged; however, there is a modification in the overall system of the linkage between the components of the product (Carayannopoulos 2009; Henderson and Clark 1990). For example, the difference between electric vehicles and gasoline-powered vehicles or the difference between plug-in hybrid electric vehicles (PHEVs) and regular hybrids in that, PHEVs can substitute electricity from the grid for gasoline.

The fifth group is "*line extension*" or "*modular innovation*". Retaining the linkages between core concepts and components of the original product (Carayannopoulos 2009; Henderson and Clark 1990), newness in this group refers to new unique component/s or design/s that the old product does not have (Kahn 2006). For instance, in the case of Apple Inc., the differences between iMac, iPod, iPhone, and iPad not only demonstrate changes in the design and the standard features of an original product, but also in the unique added elements that the previous version does not have. Another case in point is Macpac, an outdoor clothing retailer company in New Zealand, whose design of waterproof outerwear finally became effective through the use of Gor-Tex—a waterproof, breathable fabric membrane.

The sixth group refers to products that are enhanced completely in every aspect. Hence, they are also called *new generation* products in the current market. The values in this group are offered in completely new ways and as radical innovations, they challenge both modular and architectural knowledge (Carayannopoulos 2009; Henderson and Clark 1990). An example of this group in the last decade is Facebook. Prior to Facebook, Yahoo! had provided voice and video chat rooms as well as yahoo messenger as the first platforms to connect people. However, Facebook has changed the way that people previously could be connected.

The seventh category is *new-to-the-world* products which are novel products that create a completely new market that previously did not exist (Kahn 2006). In this category either a novel *supply-driven* or *demand-driven* product idea can trigger the intention to deliver value. The products in this category are very risky, and demand bearing high uncertainty. Sometimes the technology of the products in this group is so novel that it cannot attract the market. While a product concept may seem quite valuable, the market may lack the cultural and technological infrastructure to support that product. For instance, global positioning systems (GPSs) existed in the 1970s, and individual consumer GPS units were sold as early as 2000, but most consumers did not have a broad and simple conduit to work with or understand this technology until Apple introduced maps in iPhone in 2007 (Kolko 2014).

Any of the above classes can be the basis of an opportunity to set up a new business for delivering a new economic value (either through independent business or within an incumbent). Vivarelli (1991) found that aspiration to generate a higher income is a powerful determinant in the establishment of a new firm; and the opportunity to get extra income is deduced from favorable demand expectations such as the market niche or unsatisfied demand rather than factors affecting supply

conditions (e.g., technology push). As the creation of innovative products in search of profit opportunities is a pillar for the foundation of a new firm, it is reasonable to explore its impact, as the first consideration, on the entrepreneur's intention to create value.

3 Methodology

3.1 Sampling

We conducted an experimental survey of 157 prospective entrepreneurs in the ICT industry from 16 university incubators in Iran. The study aims to compare the perception of experienced and novice entrepreneurs at the pre-founding stage of their venture. The unit of analysis is the individual entrepreneurs who are at the conception stage of starting their business (Reynolds et al. 2000). The data were collected in two successive phases of intention and product innovation, with a time lag of four weeks in between.

Two distinct verification procedures were applied in order to confirm the credibility of the data in both phases of data collection (i.e. respondents were actually in the opportunity recognition phase, and the innovation levels were accurately assigned to the cases). Full details of the sampling procedure and characteristics as well as the verification procedures are available upon request from the authors.

Researchers have adopted different approaches to defining experience. Some have considered age or years of the founder's involvement in the business (cf. Kautonen et al. 2011), others have used the number of previous business ownerships (cf. Ucbasaran et al. 2009). Inconsistency between the definition of experience and the aim and scope of research can lead to wrong results as well as the risk of the confounding effect and low internal consistency (Baron 2009). For instance, age contributes significantly to cognitive development which impacts the central depending variable of the research regardless of the interest group which they belong to (Baron 2009).

To distinguish experienced from novice entrepreneurs, two criteria were considered simultaneously: the number of their previous product offerings and years of involvement in the business (Kautonen et al. 2011; Ucbasaran et al. 2009). However, to obtain a single score as the inclusion criterion, the two criteria were multiplied by the weight coefficient of 0.66 for the number of products and 0.34 for the years of involvement. We derived these weights based on a sensitivity analysis.

The tendency to give the higher weight to the number of previously commercialized products than to the years could be explained by the fact that the former is mainly related to product generation (specific experience), whereas the latter is a more general indicator of experience. Based on the sensitivity analysis, beyond ± 0.04 degrees of freedom for the weighting coefficients, there occurred a problem either in the measurement model or the sample size of the subgroups (e.g., more samples for high range innovation for the experienced group vs. few samples for low range innovation for the experienced group). Furthermore, Sarstedt et al.

(2011) argue that "the parametric approach's distributional assumptions do not fit the PLS path modeling's distribution-free character. This test seeks to scale the observed differences between groups by comparing these differences to those between groups randomly assembled from the data" (Sarstedt et al. 2011: p. 199). Therefore, to retain the property of randomness after assignment of the sample data, we were not allowed to include further participants across the subgroups.

The overall usable questionnaires comprised 77 novice and 80 experienced entrepreneurs. Ages ranged from 21 to 53, with a mean of 27.7 (SD 4.2) for the novice and 39.8 (SD 6) for the experienced entrepreneurs.

After the second wave of the data collection, thirty-five subjects were contacted randomly (according to the codes assigned after the first wave) for a short discussion over Skype or via telephone calls to check the credibility of their answers concerning the innovation degree as the sample of the total respondents. The outcome of the interview showed that there was a 34% mismatch between the respondents' choices and the actual area of their innovation (in the seven categories). However, within the major innovation ranges (low, mid, and high ranges) there was only a 5% error (mismatch). Therefore, with 95% confidence, the individual answers could be validated as a genuine indication of their responses.

3.2 Research instrument

Considering the intention model in the first version of the instrument, seven items for the value creation self-efficacy, four items for the attitude toward new value creation, and four items for the NVCI were designed as the measurements. However, following a pre-test survey among a cohort of seventy-seven individuals (other than the final participants), due to the low internal reliability coefficient (standardized alpha) and the factor pattern loadings of some items, one item from all the construct had to be excluded. All the remaining items are also validated in this research (see Tables 2, 3, 4, 5).

Concerning the innovation degree measurement, respondents were asked to think about their prospective products, and to place their products into one of the seven categories as mentioned earlier (a "forced choice" scale). As the responses move from one level to the next, the degree of innovation is deemed to increase. However, it cannot be treated as a ratio scale. This is because, the assignment of a numerical

Table 2 Reliabilities, convergent and discriminant validities, and correlations among the latent constructs for the novice entrepreneurs

Latent variables	AVE	Composite reliability	Standard error	Cronbachs Alpha	1	2	3	4
1. NVCI	0.82	0.93		0.89	0.91			
2. Oppr-Con	0.88	0.92		0.90		0.93		
3. VC-Disr	0.75	0.90		0.83	0.86		0.87	
4. VC-SE	0.63	0.90		0.85	0.77		0.77	0.79
Oppr-Con–> NVCI			0.37					

Table 3 Items and construct cross-loadings used to assess discriminant validity of the measurement model for the novice entrepreneurs

	NVCI	Oppr-Con	VC-Disr	VC-SE
NVCI1	0.93	0.81	0.77	0.74
NVCI2	0.93	0.81	0.83	0.71
NVCI3	0.85	0.72	0.73	0.63
VC-Disr1	0.85	0.87	0.94	0.73
VC-Disr2	0.56	0.71	0.75	0.61
VC-Disr3	0.81	0.80	0.90	0.64
VC-SE1	0.57	0.75	0.61	0.79
VC-SE2	0.60	0.75	0.58	0.80
VC-SE3	0.56	0.69	0.50	0.76
VC-SE4	0.76	0.85	0.72	0.85
VC-SE5	0.55	0.75	0.63	0.78
VC-SE6	0.60	0.76	0.60	0.80

Table 4 Reliabilities, convergent and discriminant validities, standard error, and correlations among the latent constructs for the experienced entrepreneurs

Latent variables	AVE	Composite reliability	Standard error	Cronbachs Alpha	1	2	3	4
1. NVCI	0.66	0.85		0.74	0.81			
2. Oppr-Con	0.75	0.82		0.86		0.86		
3. VC-Disr	0.77	0.91		0.86	0.79		0.88	
4. VC-SE	0.55	0.88		0.83	0.48		0.50	0.74
Oppr-Con–> NVCI			0.11					

Table 5 Items and construct cross-loadings used to assess the discriminant validity of the measurement model for the experienced entrepreneurs

	NVCI	Opr-Con	VC-Disr	VC-SE
NVCI1	0.82	0.65	0.74	0.43
NVCI2	0.79	0.47	0.53	0.31
NVCI3	0.83	0.59	0.62	0.42
VC-Disr1	0.71	0.77	0.92	0.47
VC-Disr2	0.79	0.74	0.89	0.44
VC-Disr3	0.58	0.68	0.84	0.40
VC-SE1	0.34	0.57	0.36	0.59
VC-SE2	0.24	0.65	0.30	0.78
VC-SE3	0.42	0.77	0.46	0.84
VC-SE4	0.39	0.66	0.31	0.77
VC-SE5	0.41	0.66	0.38	0.71
VC-SE6	0.33	0.68	0.40	0.74

value to each level of the ordinal scale introduces into the scale the property of distance between the levels of the scale itself (Franceschini and Rossetto 1995). The result of this codification suggests that the adopted numerical conversion is based on the implicit assumption that in the entrepreneur's mind, all scale levels are equispaced. However, we can never be sure that the entrepreneur perceives the subsequent levels of the scale as equispaced because an ''exact'' codification does not exist (Franceschini et al. 2004: p. 516). To solve this interpretation problem, the ordinal scale is not converted into a numerical one, rather we focus our attention only on the order of levels. Thus, three categories of low, medium, and high-level innovations are taken into account. The first three categories are considered low-level, the next two are considered medium-level, and the last two classes are considered high-level innovative products.[1]

3.3 Analysis and measurement model

All the SEM analyses were performed using the partial least squares (PLS) method (Smart-PLS package V.2) and SPSS (V.22). PLS is in particularly recommended for a model with new constructs and for research in which there is a small sample size. However, the advantage of the possibility of working with a small sample size in PLS is to the extent that the sample is not very heterogeneous (Hair et al. 2013).

The full regression equation model is as follows:

$$\begin{aligned} \text{NVCI} = {} & \beta_0 + \beta_1 \text{OprCon} + \beta_2 \text{Exp} + \beta_3 \text{InoDeg} + \beta_4 \text{OprCon} \times \text{Exp} \\ & + \beta_5 \text{OprCon} \times \text{Exp} \times \text{InoDeg} + \varepsilon \end{aligned} \tag{1}$$

The grouping analysis approach (Henseler 2012) has been recommended for the testing of the moderations, because experience and the innovation degree are categorical variables. Furthermore, since there are three levels of innovation degree, this kind of moderation can be performed using pairwise group comparisons (Sarstedt et al. 2011). We follow the Sarstedt et al. (2011: p. 201) six-stage permutation-based test procedure.

Equations 2 and 3 are used for calculating the t-value for the hypotheses 2 and 3, respectively.

Note that Eq. 2 is recommended for samples with $n > 30$ whereas Eq. 3 is recommended for smaller samples (Sarstedt et al. 2011).

$$t = \frac{\tilde{\theta}^{(1)} - \tilde{\theta}^{(2)}}{\sqrt{\left(\frac{(n^{(1)}-1)^2}{n^{(1)}+n^{(2)}-2}\right) \cdot se^2_{\tilde{\theta}(1)} + \left(\frac{(n^{(2)}-1)^2}{n^{(1)}+n^{(2)}-2}\right) \cdot se^2_{\tilde{\theta}(2)}} \cdot \sqrt{\left(\frac{1}{n^{(1)}}\right) + \left(\frac{1}{n^{(2)}}\right)}} \tag{2}$$

where $\tilde{\theta}^{(1)}$ $\tilde{\theta}$ $^{(2)}$ denote the original parameter estimates for a path relationship in group one and two, $n^{(1)}$ and $n^{(2)}$ the number of observations in group one and two, and $se^2_{\tilde{\theta}1} se^2_{\tilde{\theta}2}$ the path coefficient's standard error in group one and two obtained

[1] Please contact authors to obtain a copy of the research instrument.

from the bootstrapping procedure. In addition, t represents the empirical t-value that must be larger than the critical value from a t-distribution (1.96).

$$t = \frac{\tilde{\theta}^{(1)} - \tilde{\theta}^{(2)}}{\sqrt{\left(\frac{n^{(1)}-1}{n^{(1)}}\right) \cdot se^2_{\theta(1)} + \left(\frac{n^{(2)}-1}{n^{(2)}}\right) \cdot se^2_{\theta(2)}}}. \quad (3)$$

This equation is often used for smaller samples in PLS and in this study for hypothesis 3. Since grouping individuals according to related experience and the innovation degree leads to different small homogenous samples of individuals, further analysis for investigating the hypothesis is reasonable (Hair et al. 2013). Moreover, Henseler and Fassott (2010: p. 732) suggest Eq. 4 for determining the effect size of the moderating effect of the significant interaction in the grouping technique:

$$f^2 = \frac{R^2_{model\ with\ moderator} - R^2_{model\ without\ moderator}}{1 - R^2_{model\ with\ moderator}}. \quad (4)$$

Here R^2 denotes the amount of explained variances in the dependent variable by the related dependent variable.

In either of the SEM or PLS methods, the validity and reliability should be calculated for the measurement model, and the fitness should be determined for the structural and the overall models (Agarwal and Karahanna 2000; Liñán and Chen 2009; Yi and Davis 2003). The guidelines by Chandler and Lyon (2001) were followed for the measurement model. In this line, five criteria were evaluated: (1) Cronbach's Alpha (0.7>); (2) composite reliability (0.7>); (3) loadings (0.4≥) (Hulland 1999); (4) convergent validity which uses Average Variance Extracted (AVE) shows the correlation between a construct and its items. AVE > 0.5 is a satisfactory level (Fornell and Larcker 1981); (5) divergent validity. First, the square root of the related AVE should exceed the construct correlations with other constructs (Fornell and Larcker 1981). Second, the standardized item loadings should be higher on the constructs they are intended to measure than on other constructs (Agarwal and Karahanna 2000; Fornell and Larcker 1981; Yi and Davis 2003). All of these thresholds were fully met in the final measurement model (see Tables 2, 3, 4, 5).

4 Results

4.1 Hypotheses 1: the impact of opportunity confidence on NVCI

The opportunity confidence as the antecedent of NVCI explains 74 and 51% (R^2) of the entrepreneurial intention variance toward new value creation for the novice and the experienced entrepreneurs, respectively (Fig. 2). These percentages demonstrate a strong and a medium-level relationship between the endogenous latent variable and the independent variable for the novice and experienced entrepreneurs,

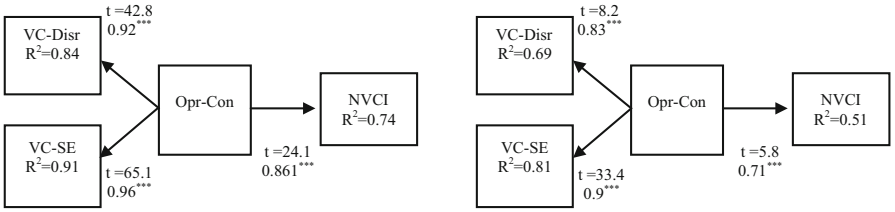

Fig. 2 Factor loading coefficients and the t-value for the novice and experienced entrepreneurs' model (from *left* to *right*). † ***P < 0.001

respectively (Chin 1998). However, as the NVCI is affected only by one variable, 0.51 still shows a strong fitness for the model (Henseler et al. 2009). The other criterion for the fitness of the structural model is Q^2 (Stone-Geisser criterion). Results show a strong fitness for this criterion for both novice (NVCI = 0.59, VC-Disr = 0.63, and VC-SE = 0.58) and experienced (NVCI = 0.33, VC-Disr = 0.54, and VC-SE = 0.43) entrepreneurs (Henseler et al. 2009). In addition, a goodness-of-fit index (GoF) is commonly used for the evaluation of the overall model in PLS. GoF of 0.78 for the novice and 0.70 for the experienced entrepreneurs demonstrate robust goodness-of-fit for the models (Wetzels et al. 2009). Therefore, based on the criteria for the measurement model, the structural, overall fitness, and the research models are fully confirmed.

According to the results, the opportunity confidence is significantly related to NVCI for both novice and experienced entrepreneurs (t-value novice > 1.96, R = 0.86; $\text{t-value}_{\text{experienced}} > 1.96$, R = 0.71). These results confirm Hypothesis 1.

4.2 Hypotheses 2: the moderating effect of experience

Although, for both novice and experienced entrepreneurs, the opportunity confidence is positively associated with NVCI (see Fig. 2), the t-value is less than 1.96 (=0.393). Therefore, at the 95% confidence level, experience does not moderate the relationship between opportunity confidence and NVCI. In other words, expertise does not make a difference to the relationship between opportunity confidence and NVCI. As such, this hypothesis cannot be confirmed.

The ANOVA results provided in Table 6 show that except for the weak difference for the first item of the value creation desirability, there are no significant differences between the measurement model items among the novice and experienced entrepreneurs. These results reinforce the rejection of hypothesis 2.

4.3 Hypotheses 3: the moderating effect of innovation degree within the entrepreneurial experience

As regards the novice group, Table 7 shows that the low-med innovation level moderates the relationship between opportunity confidence and NVCI. Moreover, due to the negative coefficient of the loading factor (R = −0.345, t-value = 3.76 > 1.96), the effect of opportunity confidence on NVCI is stronger if the innovation

Table 6 Results of the ANOVA test based on the experience variable grouping

	NVCI1	NVCI2	NVCI3	Dis1	Dis2	Dis3	SE1	SE2	SE3	SE4	SE5	SE6
F	1.7	0.68	0.22	4.5*	3	1.5	2	2.9	1.3	1.06	0.79	3.6
$SD_{experience}$	1.6	1.5	1.8	1.5	1.2	0.90	1.5	1.8	1.2	1.09	1.1	1.3
SD_{fresh}	1.3	1.3	1.5	0.94	0.91	1.02	1.3	1.6	1.2	1.05	1.4	1.06
P value	0.19	0.41	0.64	0.03	0.09	0.22	0.16	0.09	0.26	0.30	0.38	0.06

* $P < 0.05$

degree is medium rather than low. Conversely, novice entrepreneurs with low opportunity confidence are not likely to act on opportunity, even if they recognize an opportunity with mid-range innovation. Moreover, the effect size is 0.77 which demonstrates a strong interaction (Cohen 1988).

In the experienced group, on the other hand, only the mid-high level innovation moderates this relationship and according to the negative coefficient of the loading factor ($R = -0.353$, t-value $= 3.1 > 1.96$), the positive effect of opportunity confidence on NVCI is stronger if the innovation degree is high rather than moderate. Conversely, experienced entrepreneurs with low opportunity confidence are not likely to act on opportunity, even if they recognize an opportunity with high-range innovation. Furthermore, the effect size is in the medium range ($0.15 < 0.18 < 0.35$) which shows an average moderating effect power.

Therefore, the last hypothesis can be confirmed only for the variances between low-to-medium for the novice entrepreneurs and medium-to-high for experienced entrepreneurs.

5 Discussion and conclusion

Research on young firms often portrays them as entities whose survival is at risk due to their lack of "experience", lack of resources, and so on (Stinchcombe 1965). For these reasons they are often advised or even forced to commercialize their products in small niches (Covin et al. 1990). However, as far as newness is concerned, they can market their products in a big competitive market. For example, there are many stories of young firms that have commercialized their disruptive technologies which have challenged, and sometimes have taken over the place of larger and more powerful incumbents (Carayannopoulos 2009). Furthermore, an innovative young firm is not necessary led by a novice entrepreneur, but it can be founded by an experienced as well as a serial entrepreneur (this subtle point requires attention). The focus of the study was on the prospective young innovative firms and to examine how experience impacts the relationship between entrepreneurs' behavioral beliefs (opportunity confidence) and the formation of their value-creation intention and to discover whether the different levels of newness promote different sensitivity for the value creation intention.

Consistent with Dimov (2010), the results showed that opportunity confidence is positively related to the intention to create value, and this relationship is a function

Table 7 Full results of the grouping analyses for hypothesis 3

	R	R_1^2	R_2^2	*T*	SE	*n*	f^2
Opr Con–> NVCI. if NovL, then value 1 other 0	0.96***			150	0.0095	15	
Opr Con–> NVCI. if NovM, then value 1 other 0	0.70***			10.6	0.103	24	
Opr Con–> NVCI. if NovH, then value 1 other 0	0.74***			14.4	0.079	38	
Opr Con–> NVCI. if ExL, then value 1 other 0	0.89***			31.8	0.028	17	
Opr Con–> NVCI. if ExM, then value 1 other 0	0.87***			17.6	0.05	27	
Opr Con–> NVCI. if ExH, then value 1 other 0[a]	0.40*			1.98	0.21	36	
NovL vs. NovM	Interaction Sig	0.89	0.80	**2.64**		39	0.77
NovL vs. NovH		Interaction not Sig		1.72		53	
NovM vs. NovH		Interaction not Sig		0.51		62	
ExL vs. ExM		Interaction not Sig		0.26		44	
ExL vs. ExH		Interaction not Sig		1.87		53	
ExM vs. ExH	Interaction Sig	0.58	0.51	**2.56**		63	0.18
Opr Con × NovL vs. NovM, NovL coded 1, NovM Coded 2	−0.345***			3.76			
Opr Con × ExM vs. ExH, ExM coded 1, ExH coded 2	−0.353***			3.1			

Opr Con opportunity confidence, *NovL* Novice × Low innovation, *NovM* Novice × mid innovation, *NovH* Novice × High innovation, *ExL* Experience × Low innovation, *ExM* Experienced × Mid innovation, *ExH* Experienced × High innovation; *R* = loading between; R_1^2 and R_2^2 denote the amount of explained variances in the dependent variables by the related dependent variables with and without a moderator, respectively

† $P < 0.10$; * $P < 0.05$, *** $P < 0.001$

[a] With over 5000 permutation runs by bootstrapping command (Hair et al. 2013)

of the value creation desirability and self-efficacy. In addition, experience did not moderate the relationship between opportunity confidence and NVCI. Besides, the high R^2 (74%) for the novice entrepreneurs might even suggest a high overconfidence for this group.

The analyses regarding the interaction of the innovation degree showed that experts differ from novices in the way they treat the problems they face (Glaser and Chi 1988). Wasserman (2012) asserted that many entrepreneurs are overconfident about their prospects and naïve about the problems they will face. Nonetheless, no one can be certain about the outcome because sometimes lack of experience that challenges young and novice entrepreneurs can also create important learning advantages (Carayannopoulos 2009). Novel products can guarantee competitive advantage to a large extent. However, fear of failure is a notable obstacle to acting on novel ideas. This might be because the more innovative a product is, the more complex it will be and the more risky commercialization will be. As such, it potentially jeopardizes the employment, income, market uptake, and identity of a businessperson in his career. Hence, entrepreneurs take the difficulties of starting an operational venture with a risky product into consideration. Contrarily, more innovative products can lead to more competitive advantage which is a tremendous success factor in competitive markets for young firms, hence, a notable persuading factor. Wärneryd (1988) calls this encouragement, the *quest for novelty* when an entrepreneur has the skill, ability, and self-confidence to commercialize a risky product (innovative product). Our results showed that if entrepreneurs have the required opportunity confidence, then the medium and high-level innovation can increase the likelihood of acting on the product opportunity for novice and experienced entrepreneurs, respectively. For novice entrepreneurs, the innovation variance from low to medium moderates the relationship between opportunity confidence and NVCI. In fact, this relationship was strengthened by the medium novelty level. As such, novice entrepreneurs may be less willing to market a new product with a low novelty degree. Whereas, for experienced entrepreneurs, the variance from medium to high moderates the relationship. Moreover, radical innovation augments the relationship. Therefore, they may have a lower disposition toward new value creation with the medium novelty degree.

This inference conforms with McMullen and Shepherd's (2006) notion of *"first-person opportunity"* (i.e. *is this an opportunity for me to pursue?*). Because opportunity is a personal construct, which depends on the judgment of whether or not a specific set of circumstances represent an opportunity for a particular person (Wood et al. 2014). An opportunity is a favorable situation for a particular person, but not all situations are opportunities (McMullen 2015) (e.g., offering radically innovative products) which demand a consistent person-behavioral belief nexus (i.e. opportunity self-efficacy and desirability of the situation) and the situation (i.e. the entrepreneurial task at hand).

These findings also may suggest a generic tendency of novice and experienced entrepreneurs to gravitate to different levels of novelty. It implies that if prospective entrepreneurs gain opportunity confidence, the perception of starting a business through a moderate innovation idea increases NVCI for the novice entrepreneurs,

whereas, the perception of starting a business through radical innovation idea increases NVCI for the experienced entrepreneurs.

Beside these theoretical contributions, the findings have important implications for policymakers, market practitioners and investors in developing countries. In addition to their quantitative evaluation methods, they can be helpful by considering these findings when allocating scarce resources to entrepreneurial projects. For example, knowing that novice entrepreneurs may dedicate more time and effort to a mid-range innovation, investors can expect them to be more resolute in their endeavors for these kinds of projects. For example, if due to a certain strategy, policymakers in decision making settings prioritize ground-breaking innovations over low level ones, they can allocate reseources to the experienced or serial entrepreneurs because they are more fitting and superior alternatives for these kinds of projects. We recommend future studies to replicate these results to provide greater generalizability.

A potential criticism may be that the hypothesis regarding the impact of innovation degree on entrepreneurial intention may not appear new.[2] However, the arguments offer novel insights when taken as a whole, and in particular considering the extension of entrepreneurial intention[3] to the value creation (products or services) and the role of experience and the three different ranges of innovation in this extension through the quantitative evidence.

5.1 Limitation and implication for future studies

This study has two main limitations. First, although we tried to ensure that the participants did not progress their product ideas, it was relatively unlikely that all of them were exactly in the same stage of their idea development (holding all other factors such as risk aversion, attitude towards change, and the capacity to develop innovation constant). This particular uncertainty about the sample was a limitation in this study.

Second, the problem of the sample size is inevitable in most of the multi-grouping analyses. In this research, out of 1450 entrepreneurs in the target population, only 157 individuals' questionnaires could be used. Hence, it resulted in small sample sizes in some categories for analyzing the moderating effect of the innovation degree. However, we tried to overcome this shortage by choosing a homogenous sample.

This research did not consider the role of the determinants of the innovative output. For example, innovation can be embodied in external changes in technology

[2] For example, Rogers (2003) had previously argued that the complexity of technology (the degree to which an innovation is perceived as relatively difficult to understand and use" [p. 15]) is negatively associated with the rate of adoption. As such, an extreme complexity of innovation is a significant obstacle to its adoption. However, the level of analysis in Roger's framework and many later successors were technology while in this research it was largely the product.

[3] Previous studies have focused on the individual's intention to become a self-employed or owner-manager (cf. Fitzsimmons and Douglas 2011; Linan and Chen 2009; Thompson 2009) or, on the study of intention in the formation and start-up of a new firm (cf. Frank et al. 2007; Kautonen et al. 2013) or in the domain of growth, on internationalization or the intention to exit (see Liñán and Fayolle 2015).

(Davidsson 2015), third person innovation (McMullen and Shepherd 2006) or in-house R&D (entrepreneur's invention). Each of these sources can impact innovation intensity differently for young innovative companies (Pellegrino et al. 2015). An interesting line of research would be to discover how different determinants of innovation can impact the relationship between opportunity confidence and the likelihood of acting on the opportunity and whether expertise moderates this relationship and further through a longitudinal research to find out which of the determinants lead to success or failure. Furthermore, since innovation capacity depends on the context (Pellegrino et al. 2015), we suggest that this study be conducted across regions, e.g., developed vs. developing countries, large business based countries vs. SME-based countries, and emerging markets vs. emerged or established markets.

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