



A ten-year cross-national examination of the dance between intuition and rationality in entrepreneurial processes

C. Troise¹ · D. Matricano¹ · E. Candelo² · L. Schjoedt³

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Abstract

Entrepreneurs rely, to a degree, on intuition while they also rely on rationality. Both are associated with formation of expectations for new venture creation as well as perseverance of efforts in managing the new venture and its creation. Global Entrepreneurship Monitor data from three distinct countries over a ten-year period are used in logistic regression analysis to find, not unexpectedly, that intuition and rationality vary in impact across countries and over time. While the findings confirm past findings, they also provide intriguing new insights into the dance between intuition and rationality in entrepreneurial processes.

Keywords Entrepreneurship · Decision-making · Intuition · Rationality · Cross-national analysis · Longitudinal analysis

✉ C. Troise
ciro.troise@unicampania.it

D. Matricano
diego.matricano@unicampania.it

E. Candelo
elena.candelo@unito.it

L. Schjoedt
leonschjoedt@ymail.com

¹ Department of Economics, University of Campania “Luigi Vanvitelli”, Capua, Italy

² Department of Management, Univeristy of Turin, Turin, Italy

³ Entrepreneurship Division Faculty, Babson College, Babson Park, MA, USA

Introduction

Entrepreneurial processes are laden with uncertainty. It means that entrepreneurs have to rely on their intuition and rationality as they create and manage their new ventures. Intuition is instinctive thoughts that occur without conscious reasoning. Unlike intuition, rationality is a state of being agreeable to reason. In situations characterized by uncertainty, expectation refers to a belief about what is most likely to happen in the future whereas preservation refers to the continuation of efforts. As such, it is important to examine how intuition and rationality engages in a dance as entrepreneurs create and manage their new ventures (Allinson et al., 2000; Caputo & Pellegrini, 2019; De Winnaar & Scholtz, 2019; Deligianni et al., 2016; Mitchell et al., 2005; Shepherd et al., 2015).

With the preceding in mind, the goal of the present study is to examine how intuition and rationality impact entrepreneurs' expectations and perseverance. In the pursuit of this goal, two objectives are set for the study. The first objective is to test the impact that intuition-related factors (that is alertness to opportunities to create new ventures) and fear of failure; and rationality-related factors (that is, human capital in the shape of knowledge, skills, and abilities) entrepreneurs hold or are held by other entrepreneurs in their network, have on entrepreneurial processes (that reveal themselves by the act of new venture creation and by the management of established firms). Because little is known about regional differences in entrepreneurship (Jing et al., 2015), the second objective is to compare and contrast these relationships among the three distinct countries of China, Italy, and US on three continents over a ten-year period, specifically across 2006, 2012, and 2016. With this study, we seek to provide new insights into the dance between intuition and rationality in entrepreneurial processes.

To achieve these goals, we present our study as follows. Next, we consider the literature on factors of intuition and rationality. Rather than merely referring to a priori selected factors, milestones in the entrepreneurship literature will guide our choice of factors (Granovetter, 1985; Kirzner, 1973; MacMillan, 1986; Timmons, 1978). These literature considerations drive a set of eight hypotheses that will be tested. To do this, we describe the research methods employed in the study next. With the methods described, we present the results to determine whether the hypotheses are supported. Lastly, we summarize our findings, illustrate how these findings in combination provide new insights, and consider the study limitations to suggest potential opportunities for future research in a discussion.

Theoretical background and hypotheses development

Scholars agree on the idea that entrepreneurship is not a spot phenomenon (Johannisson, 2011; Leyden & Link, 2015; Steyaert, 2007). It is a process originating with personal involvement and that is affected by many factors. Planned activities are combined with random occurrences, and predetermined actions may

be replaced with rushed decisions. This means entrepreneurship is a process that is affected by planned activity and uncertainty.

In past research, scholars have investigated entrepreneurs' decision-making and actions (Krueger, 2003; Morales-Gualdrón & Roig, 2005; Nord & Fox, 1996). This research includes approaches like cognition (Krueger, 2003), microeconomic, psychological (Morales-Gualdrón & Roig, 2005), institutional economics, and contextual analyses (Nord & Fox, 1996). In recent years, scholars have begun to examine entrepreneurs' decision-making process (Gibcus et al., 2009; Mitchell et al., 2004, 2007; Sadler-Smith, 2004, 2016; Shepherd, 2015), even at the neuroscientific level (Shaver et al., 2017). In this body of research, scholars pay particular attention to the role that intuition and rationality play in decision-making (Allinson et al., 2000; De Winnaar & Scholtz, 2019; Deligianni et al., 2016; Mitchell et al., 2005; Shepherd et al., 2015). In light of this, it may be expected that an appreciation of the dance between intuition and rationality in entrepreneurship has been examined; however, it has received scant attention from researchers. The underlying assumption in this dance between intuition and rationality is that entrepreneurs are torn between (1) a non-rational, fast system of thought based on an automatic, associative, and selective processing of tacit knowledge and explicit information (Kahneman, 2011; Lieberman, 2000; Stanovich & West, 2000) and (2) a rational, deliberate but slower thought process based upon an effortful and rule-based processing of explicit information (Hogarth & Karelaia, 2005; Kahneman, 2011; Stanovich & West, 2000). An examination of the vast number of factors that may affect the dance between intuition and rationality in entrepreneurial processes may be beyond the scope of any study; therefore in this study, the evolution of the entrepreneurship literature pertaining to intuition and rationality will drive our development of the hypotheses.

Intuition-related factors and expectations

Upon Schumpeter (1911) published his seminal work on bringing innovation onto markets through the creation of new firms, scholars began investigating how individual differences affect entrepreneurship. Sutton (1954) examined the desire for responsibility. Davids (1963) investigated the desire for independence and self-confidence. McClelland (1961) studied the desire for accomplishment (that is, the need for achievement). It was Kirzner (1973) to provide an alternative to this work in entrepreneurship by introducing the concept of alertness. In his view, entrepreneurship rests upon the “pure entrepreneur whose entire role arises out of his alertness to hitherto unnoticed opportunities” (p. 39). At its core, alertness is a subjective perception that a person has about opportunities for new venture creation. As this implies, it is not all people who perceive entrepreneurial opportunities. Such opportunity recognition is crucial in entrepreneurship (Zhao et al., 2020). This, in turn, affects people's interest and involvement in entrepreneurship (i.e. the launch of new ventures). It may be assumed from the work of Kirzner (Ardichvili et al., 2003; Baron & Ensley, 2006; Blume & Covin, 2011) that alertness to entrepreneurial opportunities is a form of entrepreneurial intuition. This entrepreneurial intuition, or alertness to entrepreneurial opportunities, may create a positive perceptual bias that

results people form expectations about new venture creation (Dimov, 2007). Thus, we hypothesize:

H1: The more entrepreneurial opportunities entrepreneurs perceive, the higher the expectations are for launching new ventures.

Recognition of opportunities is not the only factor in launching a new venture. In fact, entrepreneurs evaluate if they can manage the activities necessary to launch the new venture; they consider entrepreneurial risk (Robinson & Marino, 2015). Since the early considerations of the entrepreneur, entrepreneurial risk has been a factor in entrepreneurship (Cantillion, 1755; Mill, 1848). Considerations of entrepreneurs as risk bearers continue into modern entrepreneurship research (Churchill, 1997; Timmons, 1978). It should be elucidated that entrepreneurs are risk bearers, not necessarily risk takers. Scholars point out that entrepreneurs are moderate risk takers (Churchill, 1997; Timmons, 1978). As a risk bearer, entrepreneurs assume and manage the risk with which they perceive they can cope meaning that fear of failure is a critical factor in entrepreneurship (Cacciotti et al., 2016, 2020; Kollmann et al., 2017). Consequently, fear of failure may generate a perceptual bias, a negative perceptual bias that reduces the expectations for launching a new venture. Scholars (Arenius & Minniti, 2005; Langowitz & Minniti, 2007; Minniti & Nardone, 2007; Wagner, 2007) have shown that fear of failure, an intuition, has a negative impact that lowers entrepreneurs' expectations. Therefore, we hypothesize:

H2: The higher level of entrepreneurs' perceived fear of failure, the lower the expectations for launching new ventures.

Rationality-related factors and expectations

An alternative to intuition per alertness (Kirzner, 1973) and fear of failure (Cacciotti et al., 2016, 2020; Kollmann et al., 2017) is rationality, which has been shown to be relevant in entrepreneurial processes. Based on the management literature (Conner & Prahalad, 1996; Grant, 1996; Spender, 1996; Spender & Grant, 1996), scholars have illustrated the relevance of knowledge-based rationality in entrepreneurship (Birley & Westhead, 1993, 1994; Low & MacMillan, 1988; MacMillan, 1986; McGrath & MacMillan, 2000; Starr & Bygrave, 1991; Ucbasaran et al., 2003a, 2003b; Westhead & Wright, 1998a, 1998b; Wiklund & Shepherd, 2008). In this perspective, entrepreneurship is not based on intuition in the form of alertness or fear of failure; instead, it is based on knowledge-driven rationality. Consequently, when entrepreneurs employ their human capital, that is their knowledge, skills, and abilities, they may form expectations to launch new ventures (Chitsaz et al., 2019; Davidsson & Honig, 2003; Marvel et al., 2016; Matricano, 2016; Unger et al., 2011). Hence, we hypothesize:

H3: The more human capital, that is knowledge, skills, and abilities, entrepreneurs hold, the higher the expectations for launching new ventures.

Rationality in entrepreneurship has also been examined in the context of network theory (Aldrich & Zimmer, 1986; Birley, 1985; Greve, 1995; Greve & Salaff, 2003; Hoang & Antoncic, 2003; Johannisson, 1986, 1988; Reynolds, 1991; Slotte-Kock & Coviello, 2010; Starr & MacMillan, 1990). A person's network offers potential

access to the human capital of others in the network; as such, the network constitutes a potential resource of human capital for an entrepreneur. This means that if an entrepreneur can access others' human capital, it may be seen as enhancing the entrepreneur's human capital (Aldrich & Zimmer, 1986). The opportunity to employ the human capital of others in the entrepreneur's network, such as others' previous entrepreneurial experiences, enhances the entrepreneur's expectations for new venture creation (Anderson et al., 2007; Chitsaz et al., 2019; De Carolis & Saporito, 2006; Matricano, 2016). Thus, we hypothesize:

H4: The more human capital, that is knowledge, skills, and abilities, held by other entrepreneurs in an entrepreneur's network, the higher their expectations are for new venture launch.

Intuition- and rationality-related factors and perseverance

As previously pointed out entrepreneurship is not an activity that takes place at one point of time phenomenon (Johannisson, 2011; Leyden & Link, 2015; Steyaert, 2007); it is a process that occurs over time. In entrepreneurship, perseverance, the doing of something despite its difficulty or any delay to achieve an outcome, is important. While the preceding four hypotheses pertained to expectations for launching new ventures, it takes time to create new ventures, and entrepreneurs are likely to encounter obstacles and delays as they create new ventures, it is important to also consider the impact of intuition and rationality on entrepreneurs' perseverance in managing the new ventures during the creation and afterwards. Experiences (driving to successful or unsuccessful results) are useful to entrepreneurs who can improve their ability to perceive what happens around them and can develop a better, in-depth knowledge of entrepreneurial matters (Baron & Ensley, 2006; Ripsas, 1998; Shepherd et al., 2000). Intuition- and rationality-related factors developed because of direct involvement in entrepreneurship can exert a positive effect on the ongoing of firms that somehow recalls what MacMillan (1986) defines the "technology of entrepreneurship" in reference to habitual entrepreneurs. In particular, as argued by McGrath and MacMillan (2000), entrepreneurs are characterized by the passionate search for new business opportunities; by the enormous discipline in pursuing them; from the decision to pursue only the best; from the ability to adapt and, finally, from the use of personal energy in one's field of activity. The five characteristics listed above underline the greater involvement that entrepreneurs show in activities aiming to identifying and pursuing business opportunities. These activities still depend on intuition and rationality (Westhead et al., 2005) and it is not possible to hypothesize if they depend more on intuition or rationality since they are the result of random occurrences that necessarily affect entrepreneurship (Ramoglou, 2021; Woo et al., 1994).

Accordingly, we present the following four hypotheses:

H5: The more new entrepreneurial opportunities entrepreneurs perceive, the longer time they will manage their ventures.

H6: The higher level of fear of failure of entrepreneurs perceive, the shorter time they will manage their ventures.

H7: The more human capital entrepreneurs hold, the longer time they will manage their ventures.

H8: The more human capital held by other entrepreneurs in an entrepreneur's network, the longer time they will manage their ventures.

At this stage, the whole theoretical framework (including intuition- and rationality-related factors in reference to both start up and growth expectations) can be depicted in Fig. 1. The labels used to refer to each variable are shown in parenthesis.

In Fig. 1 is provided a graphical overview of the relationships hypothesized.

In the parenthesis are shown the labels for the variables and the associated hypotheses.

Research method

Sample and data collection

Data from the Global Entrepreneurship Monitor (GEM; gemconsortium.org) were used to test the hypotheses. GEM is a consortium of universities from around the world with the purpose of collecting data for the study of entrepreneurs and entrepreneurship to facilitate making comparisons across borders and over time (Reynolds et al., 1994, 2001, 2005; Morales-Gualdrón & Roig, 2005; Mühlböck et al., 2018). These data rely on well-known measures and so they guarantee reliability and replicability of empirical analyses. GEM reports have significant impacts on entrepreneurship research and offer a relevant solution to an issue that existed until the late 1990s, namely the lack of comparable international data on entrepreneurship and venture creation (Bosma, 2013; Reynolds et al., 1994, 2005). As Bosma observes (2013, p. 143) “since 1999 GEM reports have been a key source of comparable data across a large variety of countries on attitudes toward entrepreneurship, start-up and established business activities, and aspirations of entrepreneurs for their businesses.” This makes GEM data useful in comparative research and for this reason have been used in a multitude of studies (Aparicio et al., 2016; Arenius & Kovalainen, 2006; Maula et al., 2005; Morales-Gualdrón & Roig, 2005; Mühlböck et al., 2018; Ramos-Rodriguez et al., 2010).

To test our hypotheses, we employed GEM data for China, Italy and US from 2006, 2012 and 2016. Our choice to conduct a cross-cultural study was based

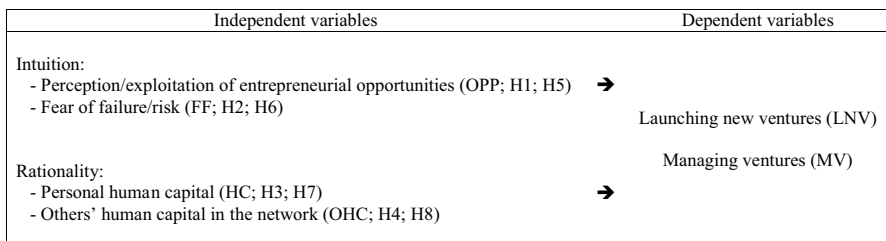


Fig. 1 Theoretical framework

on two aspects: (1) little is known about regional differences in entrepreneurship (Jing et al., 2015) and (2) entrepreneurship research indicates that culture and country characteristics have important effects on people and on people's attitudes and behaviors (Chua et al., 2009; Dileo & García Pereiro, 2019; Zheng et al., 2014). The inclusion of the US was based upon the rationale that a vast amount of published entrepreneurship research is conducted using samples from the US which provides opportunity for comparisons with a substantial amount of research in the extant literature. The choice of including China was based upon China is a fast growing economy with a high rate of new venture creation (He et al., 2019); plus it is profoundly different from the US. Lastly, we wanted to include an EU country that is not close in terms of culture to the US, such as the UK, while also having a lower entrepreneurial activity rate according to GEM than both the US and China. Based on these considerations, we chose Italy.

The choice of focusing on China, Italy and USA, allows us to explore intuition/rationality in three different countries. New venture creation has fuelled a significant portion of the growth of these countries—as highlighted by several international reports (see among others annual GEM reports)—and there, in the last few decades, the entrepreneurial sector has grown rapidly as well as new regulations to foster entrepreneurship were introduced (Ahlstrom & Ding, 2014; Dileo & García Pereiro, 2019; He et al., 2019; Jing et al., 2015; Matricano, 2020; Troise & Tani, 2021). As suggested by Jing et al. (2015), despite the internationalization background of entrepreneurship, little is known about the similarities and differences of entrepreneurial processes and their antecedents in different regions. Both intuition- and rationality-related factors may have different effects on entrepreneurial processes in different countries, however, currently little research has examined intuition and rationality from a cross-cultural perspective, although these parameters and the entrepreneurial processes may vary across cultures.

Our choice of the years 2006 and 2012 is based on a study provided by Mühlböck et al. (2018). These two years offer opportunity to make comparisons from before and after the global economic crisis. Furthermore, we also focus on the last database available at the time of data collection (Morales-Gualdrón & Roig, 2005). Therefore, we added the data from 2016 because it is the last complete data set available at the time of this study and it represents the most recent possible situation of the current scenario. About this, it is appropriate to keep in mind that GEM full datasets are only made available to the public 3 years after data collection. The sample sizes for each of the countries and years are presented in Table 1.

Table 1 Samples

	2006	2012	2016
<i>China</i>	2399	3684	3974
<i>Italy</i>	1999	2000	2045
<i>US</i>	3012	5499	3000

Dependent, Independent, and Control Variables

Dependent variables

The hypotheses require consideration of two dependent variables: expectations for launch of new ventures (LNV) in hypotheses 1–4 and perseverance in managing ventures (MV) in hypotheses 5–8. This choice is in line with previous studies (Arafat & Saleem, 2017; Maula et al., 2005; Mühlböck et al., 2018). In the GEM data, LNV is a binary variable that was coded 1, if respondents indicated they are planning to create a new venture in the next three years, and 0, if not (data source: GEM 2006, 2012, 2016 [futsup]). Also a binary variable is MV that was coded 1, if respondents indicate they manage and owns a business that has been in existence than no more 42 months, and 0, if otherwise (data source: GEM 2006, 2012, 2016 [babybuso]).

Independent variables

Intuition was assessed in two forms in accordance with the hypotheses: alertness to entrepreneurial opportunities (OPP) and fear of failure (FF). OPP reflects whether a participant perceive the existence of opportunities for new venture creation in the local area or not. It was coded as a binary variable with 1, if the respondents perceive business opportunities, and 0, if not (data source: GEM 2006, 2012, 2016 [opport]). FF indicates whether a participant is afraid of failing with the creation of a new venture. This was coded as a binary variable with 1, if respondents who indicate they fear failing when creating a new venture, and 0, if not (data source: GEM 2006, 2012, 2016 [fearfail]).

Rationality was gauged in two ways by the entrepreneurs' human capital (HC) (that is, knowledge, skills, and abilities) and by other people's HC in the entrepreneurs' network (OHC). HC was a binary variable that was coded 1, if participants leveraged their human capital in the form of personal knowledge, skills, and abilities as part of the new venture creation, and 0, if not (data source: GEM 2006, 2012, 2016 [suskill]). OHC assessed if the participant's had potential to leverage the human capital of others in their network. In effect, OHC was a binary variable coded 1, if participants knew other entrepreneurs in their network, or 0, if not (data source: GEM 2006, 2012, 2016 [knowent]).

The data, including the coding schemes, were provided by GEM in the publicly available data. The variables and their coding are in line with previous published research (Arafat & Saleem, 2017; Maula et al., 2005; Morales-Gualdrón & Roig, 2005; Mühlböck et al., 2018).

Control variables

Control variables were included in the study to rule out alternative explanations (Becker, 2005; Schjoedt & Bird, 2014). This is a common practice in

entrepreneurship research (as well as in other areas of research) according to Schjoedt and Sangboon (2015a, 2015b). Consistent with prior studies (Arafat & Saleem, 2017; Morales-Gualdrón & Roig, 2005; Mühlböck et al., 2018), we included three control variables: gender, age, and education. Gender, which has been shown to have an impact on entrepreneurship (Guelich et al., 2021), was coded as 0 for males and 1 for females (data source: GEM 2006, 2012 and 2016 [gender]). Age is a proxy for experience and has been shown to be associated with entrepreneurship (Gartner et al., 2004) and was expressed in years (data source: GEM 2006, 2012 and 2016 [age]). Education is expression of the level of formal education and is used in many studies as a proxy for human capital (Unger et al., 2011) as the purpose of education is to transfer explicit general knowledge to people. To control for the effects of explicit general knowledge, education was included as a control variable. It was coded 1, if the participant had a high level of educational achievement (that is, post-secondary or higher level of education), and 0, for a lower level of educational achievements as in previous research (Mühlböck et al., 2018) (data source: adapted from GEM 2006 and GEM 2012, 2016 [uneduc]). This approach of classifying education into high and low harmonizes the data across the years.

Statistical analysis

Logistic regression analysis was employed to analyse the data in testing the hypothesized relationships (define the explanatory power of our four independent variables) due to the use of binary dependent variables (Agresti, 2010; Hair et al., 2019; Long & Freese, 2006). Because of the two different dependent variables, we performed two sets of analyses, meaning two separate regression models for each of the years 2006, 2012 and 2016 for each of the three countries. It offers opportunity to compare the results across countries and years (Arafat & Saleem, 2017; Greene, 2002).

The choice to use logistic regressions is in line with many other studies in the field of entrepreneurship (see among others Maula et al., 2005; Morales-Gualdrón & Roig, 2005; Arafat & Saleem, 2017; Mühlböck et al., 2018) and it allows us to identify the variables that explain the differences between groups (moreover these models do not consider data distribution). These models represent the most appropriate techniques for assessing the proposed hypotheses as they allow us “to predict and explain a dependent categorical binary variable via a group of independent covariables, amongst which not only qualitative (categorical) but also quantitative variables can be included” (Morales-Gualdrón & Roig, 2005, p. 488).

Consistent with previous research (Arafat & Saleem, 2017; Maula et al., 2005; Morales-Gualdrón & Roig, 2005; Ramos-Rodriguez et al., 2010), we test the robustness of the models. First, we assessed multicollinearity, that is the correlation amongst independent variables. Second, using both the variance inflation factors (VIFs) and the correlation matrices for each year and country, we assess whether multicollinearity is a concern in the present study. Specifically, if the VIF is below the conventional thresholds [6 for the mean VIFs and 10 for the maximum VIFs (Kutner et al., 2005; Lin, 2008; McDonald & Moffitt, 1980)] and the correlation

is lower in magnitude than the threshold of 0.7 (Ratner, 2009), we considered the models robust.

Results

Descriptive statistics and robustness checks

Descriptive statistics are reported for each year respectively in Tables 2, 3 and 4.

As we expected, there are differences in entrepreneurial activity among China, Italy, and the US. In 2006, the percentages of participants who plan to create a new venture in the next three years is highest in China with about 36% and lower in both Italy with about 12% and in the US with about 11%. In China about 11% of the participants manage and own a business. This percentage is 1.1% in Italy and 29% for the US.

Table 2 presents the descriptive statistics for year 2006. As for the independent variables, the table shows that OPP among the participants were about 34% in China; about 22% in Italy; and about 19% in the US. FF among the participants was about in China 24%; 23% in Italy and 12% in the US. HC among the participants were about 35% in China; 28% in Italy; and 35% in the US. OHC among the participants were in China about 47%; about 22% in Italy; and about 21% in the US. The control variables shown in the table reveal that the samples consisted of about half men and women. The average age among the participants was in China about 37 years; in Italy 47 years; and in the US 51 years. In terms of education, among the participants in China about 27% had a post-secondary education. This was in Italy about 19% and in the US about 64%.

The average VIF is 1.19 for China; 1.13 for Italy; and 1.19 for the US for the variance inflation factors in Table 2. All the correlations presented in Table 2 are lower than 0.7.

Comparing responses from 2006 with those from 2012 reveals that the participants, who plan to create a new venture in the next three years is higher in 2012 than in 2006: in China, about 22%; in Italy, about 11%; and in the US, about 13%. Further, the participants, who manage and own a business, were lower in 2006: In China with about 7.7%; in Italy, about 2.1%; and in the US, about 3.7%.

Table 3 presents the descriptive statistics for year 2012. Among the participants OPP is about 27% in China; 17% in Italy; and about 35% in the US. FF among the participants is about 35% in China; 56% in Italy; and 35% in the US. HC among the participants is about 35% in China; 29% in Italy; and 54% in the US. OHC among the participants is almost 51% in China; about 20% in Italy; and about 26% in the US. In 2012, the samples include slightly more women than men (on average about 52%). The average ages in the samples were about 38 years in China; 43 years in Italy; and 50 years on the US. The participants who had post-secondary achievements were, in China, about 26%; in Italy, almost 17%; and in the US, about 58%.

The average VIF in Table 3 are, for China, 1.09; for Italy, 1.04; and for the US, 1.05; and the highest VIF is well below 10. All the correlations are less than 0.7 in magnitude.

Table 2 Descriptive statistics and correlations for year 2006

2006		Mean	S.D	1	2	3	4	5	6	7	VIF
<i>China</i>	1	0.338	0.473	1							1.27
	2	0.240	0.427	0.175	1						1.06
	3	0.351	0.477	0.337	0.146	1					1.31
	4	0.472	0.499	0.402	0.190	0.432	1				1.40
	5	0.489	0.499	-0.066	-0.006	-0.162	-0.112	1			1.04
	6	37.213	12.175	-0.191	-0.009	-0.176	-0.213	0.031	1		1.13
	7	0.272	0.445	0.124	0.035	0.077	0.126	-0.118	-0.256	1	1.09
<i>Italy</i>	1	0.219	0.414	1							1.13
	2	0.233	0.423	0.201	1						1.11
	3	0.283	0.450	0.273	0.228	1					1.31
	4	0.219	0.414	0.238	0.218	0.431	1				1.31
	5	0.526	0.499	-0.027	0.055	-0.111	-0.119	1			1.03
	6	47.275	14.950	-0.014	-0.090	-0.118	-0.177	0.029	1		1.04
	7	0.188	0.391	0.062	-0.015	0.032	0.053	-0.057	-0.029	1	1.01
<i>US</i>	1	0.192	0.394	1							1.37
	2	0.125	0.331	0.171	1						1.05
	3	0.352	0.477	0.446	0.143	1					1.41
	4	0.216	0.411	0.417	0.154	0.441	1				1.37
	5	0.507	0.500	-0.138	0.003	-0.172	-0.088	1			1.05
	6	50.701	16.870	-0.115	-0.084	-0.097	-0.167	0.108	1		1.04
	7	0.643	0.479	0.102	0.039	0.115	0.079	-0.028	-0.009	1	1.02

SD Standard Deviation, VIF variance inflation factor

Table 3 Descriptive statistics and correlations for year 2012

2012		Mean	S.D	1	2	3	4	5	6	7	VIF
<i>China</i>	1	0.274	0.446	1							1.10
	2	0.354	0.478	-0.004	1						1.01
	3	0.357	0.479	0.247	-0.026	1					1.11
	4	0.508	0.499	0.209	0.023	0.224	1				1.09
	5	0.517	0.499	-0.052	0.027	-0.076	-0.036	1			1.01
	6	38.384	12.457	-0.067	0.076	-0.048	-0.078	-0.016	1		1.14
	7	0.258	0.438	0.070	-0.097	0.026	0.035	0.001	-0.343	1	1.14
<i>Italy</i>	1	0.170	0.376	1							1.03
	2	0.564	0.496	-0.003	1						1.01
	3	0.290	0.454	0.117	0.004	1					1.07
	4	0.200	0.400	0.139	0.029	0.193	1				1.07
	5	0.526	0.499	-0.073	0.049	-0.104	-0.089	1			1.03
	6	42.841	12.237	-0.058	-0.066	-0.093	-0.098	0.042	1		1.02
	7	0.165	0.371	0.038	-0.025	0.078	0.054	0.073	-0.001	1	1.02
<i>US</i>	1	0.353	0.478	1							1.03
	2	0.347	0.476	-0.088	1						1.03
	3	0.538	0.498	0.083	-0.106	1					1.12
	4	0.263	0.440	0.131	-0.012	0.226	1				1.09
	5	0.525	0.499	-0.050	0.044	-0.189	-0.078	1			1.04
	6	49.743	17.632	-0.013	-0.091	0.005	-0.118	0.064	1		1.03
	7	0.577	0.494	0.083	0.014	0.145	0.101	-0.009	0.041	1	1.04

SD Standard Deviation, VIF variance inflation factor

Table 4 Descriptive statistics and correlations for year 2016

2016		Mean	S.D	1	2	3	4	5	6	7	VIF
<i>China</i>	1	0.317	0.465	1							1.23
	2	0.406	0.491	0.095	1						1.01
	3	0.269	0.443	0.323	0.042	1					1.19
	4	0.505	0.500	0.359	0.088	0.321	1				1.22
	5	0.489	0.499	0.003	0.029	-0.091	-0.026	1			1.01
	6	42.492	14.833	-0.060	0.011	-0.023	-0.082	0.012	1		1.17
	7	0.324	0.468	0.113	-0.001	0.073	0.073	-0.032	-0.373	1	1.18
<i>Italy</i>	1	0.251	0.433	1							1.07
	2	0.539	0.498	-0.029	1						1.01
	3	0.307	0.461	0.131	-0.013	1					1.07
	4	0.284	0.451	0.207	0.071	0.205	1				1.10
	5	0.506	0.500	0.073	0.043	-0.158	-0.118	1			1.02
	6	43.670	12.484	-0.063	-0.105	-0.026	-0.049	0.012	1		1.02
	7	0.152	0.359	0.094	-0.027	0.043	0.065	0.105	0.054	1	1.03
<i>US</i>	1	0.505	0.500	1							1.07
	2	0.327	0.469	-0.019	1						1.03
	3	0.547	0.498	0.114	-0.138	1					1.14
	4	0.289	0.453	0.183	-0.021	0.227	1				1.10
	5	0.501	0.500	-0.075	0.049	-0.164	-0.072	1			1.04
	6	45.673	15.979	-0.117	-0.089	0.079	-0.112	0.042	1		1.05
	7	0.734	0.442	0.123	0.062	0.141	0.107	0.043	-0.018	1	1.05

SD Standard Deviation, VIF variance inflation factor

Comparing the number of participants who plan to create a new venture in the next three years in 2012 and 2016 reveal similar values: about 25% in China; about 11% in Italy; and about 15% in the US. The participants who own and manage a business are: about 5% in China; about 1.8% in Italy; and about 3.5% in the US.

Table 4 shows the descriptive statistics for year 2016. OPP among the participants were about 32% in China; 25% in Italy; and over 50% in the US. FF in the participants was approximate 40% in China; about 54% in Italy; and about 33% in the US. HC among the participants was about 27% in China; 31% in Italy; and 55% in the US. OHC was over 50% in China; about 28% in Italy; and 29% in the US. The distribution of individuals in terms of gender is equally divided in the three countries. The age of participants was slightly over 42 years in China; a little more than 43 years in Italy; and over 45 years in the US. Participants with higher than secondary-level education was, in China, about 32%; in Italy, a little over 15%; and in the US, about 73%.

The results presented in Table 4 mean that the average VIF is 1.14 for China; 1.05 for Italy; and 1.07 for the US. No correlation in Table 4 exceeds the magnitude of 0.7. As the results presented in Tables 2, 3, and 4 pertaining to robustness reveal that the models across country and across time are robust as all average VIFs are less than 6, the highest VIF is less than 10, and the magnitude of any of the correlations is less than 0.7.

Logistic regression results

In order to test the robustness of our findings, control variables and robust standard errors (in parentheses) are included in our models as shown in the tables.

Table 5 shows the logistic regression results related to 2006 with expectations (LNV) as dependent variable in model 1 and perseverance (MV) as dependent variable in model 2. As for *Intuition*, we found statistically significant evidence that OPP has full positive effects on our dependent variables for China and the US, while FF has only partial effects for China and Italy. For China, OPP has a positive impact on both LNV (model 1a, coefficient=0.627, significant at 1%) and MV (model 2a, coefficient=0.577, significant at 1%). Instead, FF has a positive impact only on LNV (model 1a, coefficient=0.324, significant at 1%) and it has no statistically significant effects on MV. These results support H1, H2 and H5 but not H6. For Italy, for both OPP and FF has a positive significant effect on LNV only (model 1b, coefficients=0.521 and 0.653, respectively, both significant at 5%). No statistically significant effects on MV are found. The evidence supports H1 and H2 but not H5 and H6. For the US, OPP has a positive effect on both LNV (model 1c, coefficient=1.262, significant at 1%) and MV (model 2c, coefficient=0.606, significant at 5%); whereas FF has no statistically significant effects on either dependent variable. This supports H1 and H5 but not H2 and H6.

These findings highlight that OPP has a positive effect in the three countries, but the strongest impact is for the US. On the other hand, FF has a positive impact only on LNV for China and Italy. This effect is strongest for Italy.

Table 5 Results of logistic regressions – Year 2006

	China		Italy		US	
	Model 1a:	Model 2a:	Model 1b:	Model 2b:	Model 1c:	Model 2c:
	LNV	MV	LNV	MV	LNV	MV
<i>Independent variables</i>						
<i>Intuition</i>						
OPP	0.627 (0.114)	0.577 (0.153)	0.521 (0.178)	0.387 (0.481)	1.262 (0.148)	0.606 (0.244)
FF	0.324 (0.122)	0.132 (0.158)	0.653 (0.166)	-0.425 (0.491)	0.153 (0.169)	-0.254 (0.307)
<i>Rationality</i>						
HC	1.008 (0.112)	1.354 (0.165)	1.132 (0.179)	2.421 (0.698)	1.623 (0.173)	2.199 (0.415)
OHC	1.188 (0.114)	0.641 (0.177)	1.148 (0.176)	0.635 (0.529)	0.793 (0.149)	1.277 (0.266)
<i>Control variables</i>						
Gender	-0.009 (0.104)	-0.081 (0.141)	-0.012 (0.159)	0.219 (0.482)	-0.373 (0.137)	-0.249 (0.238)
Age	-0.050 (0.004)	-0.022 (0.006)	-0.051 (0.006)	-0.056 (0.016)	-0.023 (0.004)	-0.016 (0.007)
Education	0.117 (0.115)	-0.320 (0.161)	-0.187 (0.205)	1.022 (0.462)	-0.139 (0.146)	0.485 (0.273)
Constant	-0.182 (0.191)	-2.629 (0.306)	-1.075 (0.279)	-4.336 (0.858)	-2.392 (0.255)	-5.287 (0.587)
<i>Model diagnostics</i>						
No. observations	2399	2399	1999	1999	3012	3012

Table 5 (continued)

2006	China		Italy		US	
	Model 1a:	Model 2a:	Model 1b:	Model 2b:	Model 1c:	Model 2c:
	LNV	MV	LNV	MV	LNV	MV
Maximum VIF	1.40	1.40	1.31	1.31	1.41	1.41
Mean VIF	1.19	1.19	1.13	1.13	1.19	1.19
Wald χ^2 sq	553.58	217.32	284.48	67.85	459.33	115.58
(Pseudo) R ²	0.241	0.144	0.232	0.213	0.276	0.233

Significance level at 1% (***), 5% (**), and 10% (*). Robust standard errors in parentheses

As for *Rationality*, a full positive significant effect on both our dependent variables is disclosed for China and the US, while this impact is partial for Italy. For China, HC has a positive effect on both LNV (model 1a, coefficient=1.008, significant at 1%) and MV (model 2a, coefficient=1.354, significant at 1%); and OHC has a positive impact on both LNV (model 1a, coefficient=1.118, significant at 1%) and MV (model 2a, coefficient=0.641, significant at 1%). These results render support for H3, H4, H7, and H8. For Italy, HC has a positive significant effect on both LNV (model 1b, coefficient=1.132, significant at 1%) and MV (model 2b, coefficient=2.421, significant at 1%); while OHC has a positive significant impact on LNV only (model 1b, coefficient=1.148, significant at 1%). Contrary to expectations, OHC does not have a statistically significant effect on MV. This supports H3, H4 and H7, while H8 is not supported. For the US, HC has a positive significant effect on LNV (model 1c, coefficient=1.623, significant at 1%) and on MV (model 2c, coefficient=2.199, significant at 1%). OHC has a significant positive effect on LNV (model 1c, coefficient=0.793, significant at 1%) and on MV (model 2c, coefficient=1.277, significant at 1%). These results support H3, H4, H7 and H8.

The results also indicate that HC has positive impacts on both MV and LNV in all the three countries while the impact is stronger on MV in Italy and the US. They also show that OHC has a weaker effect on LNV in the US and stronger effects in China and Italy. They also show that OHC has a stronger impact on MV in the US compared to Italy and China (while in these countries OHC values are similar, although it has no significant effect for Italy).

Table 6 shows the logistic regression results for 2012. As for *Intuition*, we found statistically significant evidence that OPP has full positive effects on our dependent variables for China and the US, while FF has only partial effects for the US. For China, OPP has a positive impact on both LNV (model 1d, coefficient=0.577, significant at 1%) and MV (model 2d, coefficient=0.328, significant at 5%). FF has no statistically significant effects on either LNV or MV. This supports H1 and H5 but not H2 and H6. For Italy, OPP has a positive significant impact on LNV only (model 1e, coefficient=0.717, significant at 1%), but not on MV. FF has no significant impact on either LNV or MV. This supports H1 but do not support H2, H5, or H6. For the US, OPP has a positive impact on both LNV (model 1f, coefficient=0.640, significant at 1%) and MV (model 2f, coefficient=0.365, significant at 5%). FF has a negative statistically significant impact only on LNV (model 1f, coefficient=-0.258, significant at 1%). The expectations suggested a positive effect, however this result is in line with previous studies (see among others Mitchell & Shepherd, 2011). The scholars, in fact, argue that fear of failure does not only act as an inhibitory factor (thus confirming our hypothesis); but it can also act as a motivating factor, driving entrepreneurs to be proactive (this is related to the negative statistically significance derived from elaborations). This supports H1 and H5 but not H2 or H6. The results also show that OPP has a stronger impact on LNV for Italy while it has a stronger effect on MV for both the US and China. Further, they show that FF has a significant negative effect for the US only.

We find statistically significant evidence that *Rationality* has a positive impact on both our dependent variables in the three contexts explored. For China, HC has a positive effect on both LNV (model 1d, coefficient=0.615, significant at 1%) and

Table 6 Results of logistic regressions – Year 2012

	China				Italy				US			
	Model 1d:		Model 2d:		Model 1e:		Model 2e:		Model 1f:		Model 2f:	
	LNV	MV	LNV	MV	LNV	MV	LNV	MV	LNV	MV	LNV	MV
<i>Independent variables</i>												
<i>Intuition</i>												
OPP	0.577 (0.092)	*** (0.132)	0.328 (0.132)	** (0.178)	0.717 (0.178)	*** (0.379)	0.121 (0.379)	*** (0.154)	0.640 (0.087)	*** (0.154)	0.365 (0.154)	**
FF	-0.102 (0.089)	*** (0.135)	0.007 (0.135)	0.017 (0.155)	0.017 (0.155)	-0.097 (0.329)	-0.097 (0.329)	*** (0.167)	-0.258 (0.096)	*** (0.167)	-0.101 (0.167)	
<i>Rationality</i>												
HC	0.615 (0.089)	*** (0.134)	0.794 (0.134)	*** (0.162)	1.758 (0.162)	*** (0.375)	1.793 (0.375)	*** (0.234)	1.270 (0.105)	*** (0.105)	1.473 (0.234)	***
OHC	0.470 (0.089)	*** (0.145)	0.751 (0.145)	*** (0.182)	0.319 (0.182)	* (0.338)	1.396 (0.338)	*** (0.170)	0.616 (0.089)	*** (0.089)	1.671 (0.170)	***
<i>Control variables</i>												
Gender	-0.319 (0.084)	*** (0.129)	-0.302 (0.129)	** (0.157)	-0.291 (0.157)	* (0.339)	-0.063 (0.339)	** (0.152)	-0.188 (0.088)	** (0.088)	-0.071 (0.152)	
Age	-0.034 (0.003)	*** (0.005)	-0.026 (0.005)	*** (0.007)	-0.047 (0.007)	*** (0.012)	-0.002 (0.012)	*** (0.004)	-0.031 (0.003)	*** (0.003)	-0.012 (0.004)	**
Education	0.451 (0.092)	*** (0.162)	-0.450 (0.162)	*** (0.189)	0.472 (0.189)	** (0.489)	-0.613 (0.489)	** (0.167)	-0.019 (0.090)	-0.019 (0.090)	0.344 (0.167)	**
Constant	-0.622 (0.167)	*** (0.269)	-2.198 (0.269)	*** (0.317)	-1.165 (0.317)	*** (0.613)	-5.086 (0.613)	*** (0.315)	-1.642 (0.162)	*** (0.162)	-4.919 (0.315)	***
<i>Model diagnostics</i>												
No. observations	3684		3684	2000	2000	2000	2000	5499	5499	5499	5499	

Table 6 (continued)

2012	China		Italy		US	
	Model 1d:	Model 2d:	Model 1e:	Model 2e:	Model 1f:	Model 2f:
	LNV	MV	LNV	MV	LNV	MV
Maximum VIF	1.14	1.14	1.07	1.07	1.12	1.12
Mean VIF	1.09	1.09	1.04	1.04	1.05	1.05
Wald χ^2 sq	350.19	149.95	235.22	57.70	481.12	235.78
(Pseudo) R ²	0.098	0.072	0.185	0.148	0.130	0.159

Significance level at 1% (***) , 5% (**), and 10% (*). Robust standard errors in parentheses

MV (model 2d, coefficient=0.794, significant at 1%); and OHC also has a positive impact on both LNV (model 1d, coefficient=0.470, significant at 1%) and MV (model 2d, coefficient=0.751, significant at 1%). This supports H3, H4, H7, and H8. For Italy, HC has significant positive effect on both LNV (model 1e, coefficient=1.758, significant at 1%) and MV (model 2e, coefficient=1.793, significant at 1%). OHC also has a positive significant effect on both LNV (model 1e, coefficient=0.319, significant at 10%) and MV (model 2e, coefficient=1.396, significant at 1%). These results provide support for H3, H4, H7, and H8. For the US, HC has a positive significant effect of HC on both LNV (model 2f, coefficient=1.270, significant at 1%) and MV (model 1f, coefficient=1.473, significant at 1%). OHC has a significant positive effect on both LNV (model 2f, coefficient=0.616, significant at 1%) and MV (model 1f, coefficient=1.671, significant at 1%). These results lend support for H3, H4, H7, and H8. The results also show that HC has a stronger effect on both MV and on LNV for Italy. HC has significant effects on both LMV and MV in the US with higher values than in China. The results further show that OHC has a stronger impact on LNV and on MV in the US.

Table 7 shows the logistic regression results for 2016. As for *Intuition*, we found statistically significant evidence that OPP has full positive effects on LNV in the three countries, while found that FF has significant negative effects on MV in the three countries explored (while we expected a positive impact). For China, OPP has a positive impact on both LNV (model 1 g, coefficient=0.411, significant at 1%) and MV (model 2 g, coefficient=0.493, significant at 1%). And, FF has a significant negative effect on MV only (model 2 g, coefficient=-0.451, significant at 1%). These results provide support for H1 and H5 but not H2 and H6. For Italy, OPP has a positive impact on LNV only (model 1 h, coefficient=0.367, significant at 5%) but has no statistically significant effects on MV. FF has a significant negative impact on MV only (model 2 g, coefficient=-0.850, significant at 5%). This supports H1 but not H2, H5 or H6. For the US, OPP has a positive impact on LNV only (model 1i, coefficient=0.636, significant at 1%). FF has a negative statistically significant impact on MV only (model 2i, coefficient=-0.651, significant at 5%). This lends support for H1 but not H2, H5, or H6. The results also show that OPP has a strong and significant impact on MV only for China, while it has significant effects on LNV in all three countries with the strongest impact for the US. FF has a significant negative effect in all three countries, particularly for Italy.

We find statistically significant evidence that *Rationality* has a positive impact on both our dependent variables in the three contexts explored. For China, HC has a significant positive effect on both LNV (model 1 g, coefficient=0.527, significant at 1%) and MV (model 2 g, coefficient=1.309, significant at 1%). OHC has a positive significant impact on both LNV (model 1 g, coefficient=0.874, significant at 1%) and MV (model 2 g, coefficient=1.056, significant at 1%). This supports H3, H4, H7 and H8. For Italy, HC has a significant positive effect on both LNV (model 1 h, coefficient=1.721, significant at 1%) and MV (model 2 h, coefficient=1.327, significant at 1%). OHC has a positive significant effect on both LNV (model 1 h, coefficient=0.507, significant at 1%) and MV (model 2 h, coefficient=1.572, significant at 1%). This supports H3, H4, H7 and H8. For the US, HC has a positive significant effects on both LNV (model 1i, coefficient=1.055, significant at 1%) and

Table 7 Results of logistic regressions – Year 2016

	China			Italy			US			
	Model 1 g:		Model 2 g:		Model 1 h:		Model 2 h:		Model 2i:	
	LNV	MV	LNV	MV	LNV	MV	LNV	MV	LNV	MV
<i>Initiation</i>										
OPP	0.411 (0.088)	*** 0.493 (0.163)	*** 0.367 (0.169)	** - 0.096 (0.352)	*** 1.721 (0.161)	*** 1.327 (0.381)	*** 0.636 (0.117)	*** 0.158 (0.231)	*** 0.636 (0.117)	*** 0.158 (0.231)
FF	0.005 (0.081)	*** - 0.451 (0.159)	*** - 0.153 (0.156)	** - 0.850 (0.369)	** 1.721 (0.161)	*** 1.327 (0.381)	** - 0.043 (0.119)	** - 0.651 (0.259)	** - 0.043 (0.119)	** - 0.651 (0.259)
<i>Rationality</i>										
HC	0.527 (0.091)	*** 1.309 (0.162)	*** 1.721 (0.161)	*** 1.327 (0.381)	*** 1.721 (0.161)	*** 1.327 (0.381)	*** 1.055 (0.128)	*** 1.256 (0.313)	*** 1.055 (0.128)	*** 1.256 (0.313)
OHC	0.874 (0.089)	*** 1.056 (0.213)	*** 0.507 (0.163)	*** 1.572 (0.415)	*** 0.507 (0.163)	*** 1.572 (0.415)	*** 0.601 (0.115)	*** 1.827 (0.257)	*** 0.601 (0.115)	*** 1.827 (0.257)
Gender	- 0.279 (0.079)	*** - 0.139 (0.152)	*** - 0.529 (0.165)	*** - 0.071 (0.387)	*** - 0.529 (0.165)	*** - 0.071 (0.387)	*** 0.057 (0.110)	** - 0.465 (0.224)	*** 0.057 (0.110)	** - 0.465 (0.224)
Age	- 0.037 (0.003)	*** - 0.023 (0.005)	*** - 0.056 (0.006)	*** 0.003 (0.013)	*** - 0.056 (0.006)	*** 0.003 (0.013)	*** - 0.024 (0.004)	*** - 0.026 (0.007)	*** - 0.024 (0.004)	*** - 0.026 (0.007)
Education	0.361 (0.086)	*** 0.171 (0.161)	0.107 (0.216)	0.815 (0.396)	0.107 (0.216)	0.815 (0.396)	0.109 (0.131)	- 0.104 (0.252)	0.109 (0.131)	- 0.104 (0.252)
Constant	- 0.455 (0.155)	*** - 3.375 (0.312)	*** - 0.626 (0.307)	** - 5.306 (0.679)	*** - 0.626 (0.307)	** - 5.306 (0.679)	*** - 2.085 (0.232)	*** - 3.727 (0.419)	*** - 2.085 (0.232)	*** - 3.727 (0.419)
No. observations	3974	3974	2045	2045	2045	2045	3000	3000	3000	3000
Maximum VIF	1.23	1.23	1.10	1.10	1.10	1.10	1.14	1.14	1.14	1.14
Mean VIF	1.14	1.14	1.05	1.05	1.05	1.05	1.07	1.07	1.07	1.07
Wald χ^2 sq	513.78	209.63	231.90	62.61	231.90	62.61	217.26	134.71	217.26	134.71
(Pseudo) R ²	0.124	0.139	0.189	0.148	0.189	0.148	0.097	0.177	0.097	0.177

Significance level at 1% (***), 5% (**), and 10% (*). Robust standard errors in parentheses

MV (model 2i, coefficient = 1.256, significant at 1%). OHC has a significant positive effect on both LNV (model 2i, coefficient = 0.601, significant at 1%) and MV (model 1i, coefficient = 1.827, significant at 1%). This supports H3, H4, H7 and H8. The results also show that HC has a stronger effect on LNV for Italy while it has a similar effect on MV in all three countries. They also show that OHC has a strongest impact on LNV for China and the strongest impact on MV for the US.

With the large number of hypotheses that are supported or not supported, and with hypotheses would have been supported if the relationship was in the opposite direction, it is necessary to gain an overview. Such an overview is provided in Table 8.

Table 8 reveals that H1 is supported for all three countries in each of the three years. H2 is supported in year 2006 for China and Italy but not the US; whereas it is not supported in any of the other two years. It is noteworthy to observe that if H2 was worded in a negative direction or direction-neutral, it would have been supported in the US in 2012. Both H3 and H4 are supported across all three countries in all years. H5 is supported across time in China; whereas it is not supported at any time in Italy. H5 is supported in the US in 2006 and 2012 but not in 2016. H6 is not supported in any country at any time. However, if worded in a negative direction, such a negatively worded H6 would be supported in all three countries in 2016. H7 is supported in all three countries across all three years. H8 is supported in China and the US but not in Italy in 2006 and is supported in all three countries in 2012 and 2016.

Discussions and conclusions

The purpose of the study was to investigate the dance between intuition and rationality in entrepreneurship; that is, the effects of intuition and rationality in entrepreneurial processes. Overall, we found that both intuition and rationality impacts entrepreneurial processes in three culturally distinct countries on three different continents, specifically China, Italy, and the US. In general, we found that intuition

Table 8 Overview of findings for China, Italy, and USA in years 2006, 2012, and 2016

HP	China			Italy			US		
	2006	2012	2016	2006	2012	2016	2006	2012	2016
H1	YES	YES	YES	YES	YES	YES	YES	YES	YES
H2	YES	NS	NS	YES	NS	NS	NS	RH	NS
H3	YES	YES	YES	YES	YES	YES	YES	YES	YES
H4	YES	YES	YES	YES	YES	YES	YES	YES	YES
H5	YES	YES	YES	NS	NS	NS	YES	YES	NS
H6	NS	NS	RH	NS	NS	RH	NS	NS	RH
H7	YES	YES	YES	YES	YES	YES	YES	YES	YES
H8	YES	YES	YES	NS	YES	YES	YES	YES	YES

Yes supported, *RH* rival hypothesis supported, *NS* not significant

impacts entrepreneurs' expectations and rationality affects entrepreneurs' perseverance. It should be noted that these findings are not consistent for all countries and in all years. It is noteworthy that fear of failure, an intuition factor, unexpectedly had a positive effect on expectations and on perseverance in some years; specifically on expectations in 2012 for the US and on perseverance in year 2016 for all three countries. Also, fear of failure reduced expectations for both China and Italy in 2006. At no time did fear of failure reduce perseverance for any of the three countries. We found that rationality had a positive effect on expectations and perseverance for all three countries except for perseverance in Italy in 2006. Therefore, an overall conclusion may be carefully drawn that intuition and rationality are both partners in the dance of entrepreneurial processes.

Consistent with recent studies (Pattinson, 2019; Zivdar et al., 2017) and with our findings in mind, this study enriches the entrepreneurship literature by investigating entrepreneurship across countries and time as little is known about regional differences in entrepreneurship (Jing et al., 2015; Welter, 2011; Welter & Gartner, 2016; Zahra, 2007; Zahra et al., 2014). The dance between intuition and rationality may, in part, depend on individual differences that are beyond the scope of this study, and as shown in this study depends, at least in part, on the external context and time. Our statistical elaborations disclose that the intensity of the dance between intuition and rationality in the entrepreneurship seems to vary depending on the country and time. Consequently, this study confirms that both intuition and rationality impacts entrepreneurship as the tested hypotheses were developed based on the extant literature. It also provides new insights by unexpectedly illustrating that the direction of some of the hypothesized relationships was in reverse; this is specifically pertaining to intuition as fear of failure may enhance entrepreneurs' expectations and perseverance. New insights are also gained from the consistency, or lack thereof, in the support for the hypotheses across the countries and times. It appears from considering the supported hypotheses that rationality is, what should we call it, a stable in entrepreneurship; while intuition is more temperamental, which may make the dance of entrepreneurship less straight forward and more interesting. This may explain why it seems difficult to provide a recipe for how to successfully launch and manage a new venture. We are going out on a limb when we say that both intuition and rationality are needed in entrepreneurship and it is the dance between the two that makes entrepreneurship unforeseeable and, therefore, interesting.

Limitations and suggestions for future research

As with all research, this study has its limitations. We will briefly address four limitations, which in turn suggest future research opportunities. First, the data employed in this study were secondary data retrieved from GEM. This limits our choice of statistical techniques (Arafat & Saleem, 2017) and our choice for more dynamic analysis (Aparicio et al., 2016). While the GEM data offers opportunity to investigate more than one country at one time, the data is cross-sectional in nature preventing test of causality (Cook & Campbell, 1979). Future research may provide new insights using additional or other countries and years (Aparicio et al., 2016; Caputo

& Pellegrini, 2019). This represents a promising avenue for future research and it opens up the possibility of developing further studies from here, in fact, we aim to extend this research by exploring other countries to compare differences or confirm our findings. This will allow us to verify if some similarities – beyond well-known differences – exist in reference to entrepreneurial decision-making processes.

Second, the use of GEM data reduces the opportunity to consider the details of the situations faced by the participants such a local culture or events. As research shows, cultural and other contextual factors influence participants' perceptions and responses (Drewniak & Karaszewski, 2020; Schjoedt et al., 2018). Future research may benefit from employing richer data and a qualitative research design. Thus, even in this case, a future research opportunity emerges to shed further light in this field of research.

Third, control variables were included in the logistic regression analyses. While the three control variables included were considered relevant and have been used extensively in previous entrepreneurship research, they pose two problems (Schjoedt & Bird, 2014). The use of control variables means that the variables do not represent people found in reality; they represent fictitious people with fictitious scores (Meehl, 1970, 1971). The other problem is that only three control variables were included meaning that all alternative explanations were not controlled for in the data analyses. One way to overcome both issues is what Schjoedt and Bird (2014) refer to as a conservative approach in which no control variables are included. In Tables 5, 6, and 7, we provide a “kind of” approach to this conservative approach to control variables by conducting the logistic regression analyses and presenting the independent variables as the first step, before entering the control variables. As control variables explain independent variance in the dependent variables it may be fruitful for future research to follow our approach in the analyses and presentation of the results in addition to the inclusion of additional, yet conceptually relevant and justified control variables. Based on the above, a subsequent study could be developed taking these aspects into account.

Fourth, only two variables were used as factors of intuition and rationality each. While this approach yielded findings that were consistent with previous research as well as providing new insights, future research may advance our understanding of the dance between intuition and rationality based on employing different and additional factors of intuition and rationality (Dileo & García Pereiro, 2019; Hui-Chen et al., 2014; Liñán & Fayolle, 2015). Since other variables could be used for the same purpose – and therefore to frame intuition and rationality – we aim to extend this research by replicating the models and using new additional measures. In particular, the use of other parameters (e.g. not retrieved from GEM) would allow us to adopt further more accurate statistical techniques, such as structural equation model (SEM) (Guerrero et al., 2008; Miralles et al., 2016), and therefore to investigate the mutual interaction between the variables. These limitations will allow us to further discover the role of intuition and rationality in the entrepreneurial processes and the dance between them.

In conclusion, our study of intuition and rationality in entrepreneurship confirms existing knowledge. At the same time, it advances our understanding of the dance between intuition and rationality by providing new and interesting insights that

could only be gained when examining this dance in multiple distinct countries such as China, Italy, and the US and at multiple times.

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