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# UNCERTAINTY AVOIDANCE AND INTRAPRENEURSHIP: A FOUR-LEVEL INVESTIGATION

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# UNCERTAINTY AVOIDANCE AND INTRAPRENEURSHIP: A FOUR-LEVEL INVESTIGATION

## Abstract

Although uncertainty avoidance is identified as an important concept for understanding intrapreneurial intentions, empirical findings have not been consistent in portraying a broader picture of how uncertainty avoidance shapes intrapreneurial intentions. This study bridges this gap through a four-level conceptual model of the role of uncertainty avoidance in the formation of employees' intrapreneurial intentions, differentiating among unit- and country-level uncertainty avoidance. Using the established relationship between behavioral control and intentions, we consider how employee creativity and self-efficacy influence intrapreneurial intentions. Following the person-environment fit paradigm and the resulting fit traditions of complementarity and supplementarity, we narrow in on how these processes operate within specific (stimulating or inhibiting) cultural settings in terms of uncertainty avoidance at both the unit and country levels. Using data from 787 employees on the first level nested into 73 units on the second level, 19 organizations on the third level, and eight countries on the fourth level, study shows evidence for a beneficial interplay between unit-level uncertainty avoidance and creativity or self-efficacy when there is a supplementary or complementarity fit. The interplay between behavioral and contextual factors is negative, however, when neither type of fit applies. Finally, country-level uncertainty avoidance seems to be irrelevant to intrapreneurial intentions.

**Keywords:** Intrapreneurial Intentions; Self-Efficacy; Creativity; National Culture; Uncertainty Avoidance

## Introduction

Intrapreneurship (or corporate entrepreneurship) is recognized as a very important contributor to firms' performance, causing the increased interest of researchers (e.g., Skarmeas, Lisboa, and Saridakis 2016; Turró, Alvarez, and Urbano 2016) who provide conceptual and definitional landscapes for related phenomena (Corbett et al. 2013; Morris, Kuratko, and Covin 2010). Intrapreneurial intentions are emergent behavioral inclinations related to departures from organizations' customary ways of doing business (Pinchot 1987; Antoncic and Hisrich 2003). Intrapreneurship studies generally focus on one of the three research avenues: (1) understanding the characteristics of corporate entrepreneurs (e.g., Pinchot 1987; Fitzsimmons and Douglas 2011), (2) explaining the processes and determinants of corporate entrepreneurship (e.g., Burgelman 1983; Hastuti, Talib, Wong, and Mandani 2016), or (3) accounting for the characteristics of environments that enable or hinder intrapreneurship (e.g., Merrifield 1993; Heinze and Webber 2015).

The objective of this study is to integrate the abovementioned three streams by utilizing relevant theories and multilevel analysis techniques. We focus on the characteristics of corporate entrepreneurs through explanations of their intrapreneurial intentions, which is the focal concept of the study. By doing so, we align with the first research stream. We integrate the second research stream (the processes and determinants of intrapreneurship) using premises from the theory of planned behavior (Ajzen 1991; Van Gelderen et al. 2008) with an emphasis on the link between intrapreneurial intentions and concepts related to perceived behavioral control. Namely, employees' creativity (Edwards-Schachter et al. 2015) and self-efficacy (Chen, Greene, and Crick 1998) are two individual behavioral characteristics that creativity and micro-innovation researchers identify as central to idea work and innovation. Creativity is a characteristic of an

individual employee; it is related to the frequency and effectiveness with which that employee generates novel, potentially useful ideas (Amabile 1988; Zhou and George 2001). Creativity is inevitably tied to an individual's ability to solve open-ended problems (Amabile 1988; Tierney, Farmer, and Graen 1999). Self-efficacy, which complements this focus, involves individuals' beliefs in their capabilities to affect their environments and to produce the desired outcomes (Bandura 1977; Sherer et al. 1982). Both of these characteristics represent potentially crucial predictors of intrapreneurship because of their proactive nature and because they reflect individuals' desire to change the status quo of their work settings. Finally, we integrate the third stream of research by accounting for the environmental and contextual factors that shape intrapreneurial intentions. We use the person-environment fit (P-E) paradigm and congruence (Endler and Magnusson 1976; Muchinsky and Monahan 1987) to explain the interplay between intrapreneurship and both unit-level and country-level cultural dimensions simultaneously. Consequently, we offer a holistic perspective on intrapreneurship-shaping relevant concepts at the employee, unit, firm and country levels.

When focusing on the role of environmental settings, previous studies validate the concept of intrapreneurship in various countries (e.g., Antoncic and Hisrich 2001), conduct comparative research on intrapreneurship across cultures (e.g., Urbano, Alvarez, and Turró 2013), and explain how national culture influences the development of intrapreneurship (e.g., Covin and Miller 2014). Although less than 20% of the variation in cultural values occurs between countries (Taras, Steel, and Kirkman 2016), no scholars thus far have examined the importance of fit among the prevailing characteristics of the national culture and the individual- or unit-level perceptions of that culture in terms of corporate entrepreneurship. Not all employees' or teams' perceptions about culture fit within the broader cultural framework in which they operate. We tackle this phenomenon using the P-E fit paradigm and argue that individuals' work behaviors are the result of complementary or supplementary congruence between personal and environmental attributes (Endler and Magnusson 1976; Pervin 1989; Schneider 1987). In this paper, using P-E fit paradigm, we aim to add to the abovementioned studies on the role of national culture, specifically the uncertainty-avoidance dimension, in forming and developing intrapreneurial intentions (Hofstede 1980; House, Hanges, Javidan, Dorfman, and Gupta 2004; Turró et al. 2014). However, we also acknowledge the stream of literature in which scholars have outlined the importance that individual- and unit-level cultural perceptions have in intrapreneurship (e.g., Urbano et al. 2013).

We thus examine the effects of complementary or supplementary congruence between country- and unit-level uncertainty avoidance. Uncertainty avoidance, explaining the ways in which risk and uncertainty are handled, is one of the most prominent cultural dimensions in the innovation and entrepreneurship literature (Shipton, Sanders, Bednall, Lin, and Escribá-Carda 2016; Saeed, Yousafzai, and Engelen 2014; Hofstede 1980; Thornton, Ribeiro-Soriano, and Urbano 2011; McGrath, MacMillan and Scheinberg 1992). However, scholars offer inconsistent results in terms of the role of uncertainty avoidance in intrapreneurship and even entrepreneurship in general. While some researchers (e.g., Thomas and Mueller 2000) show that national cultures with high levels of uncertainty avoidance are supportive of entrepreneurship, others claim that cultures with low uncertainty avoidance tend to be more entrepreneurial (e.g., Autio, Pathak, and Wennberg 2013; Swierczek and Ha 2003; Eroglu and Piçak; 2011). We believe that this inconsistency in results is likely because scholars have focused solely on national-level uncertainty avoidance, ignoring perceptions of individuals at lower levels, such as units, that could be substantially different from overall national uncertainty avoidance.

Based on the theoretical underpinnings of the P-E fit paradigm (Endler and Magnusson 1976; Pervin 1989; Schneider 1987), meta-analytical evidence (Sarooghi, Libaers, and Burkemper; 2015), and conceptual logic (Tung and Verbeke 2010), we propose a multilevel model of cross-level interactions among employees' characteristics of creativity and self-efficacy, their perceptions of their work settings (i.e., uncertainty avoidance in units), and the national culture (country-level uncertainty avoidance). We then test this model on a four-level data set of 787 employees nested into 73 units from 19 firms that operate in eight countries of varying national cultures.

This study's contributions are threefold. First, we applied the P-E fit paradigm (Muchinsky and Monahan 1987) to the domain of intrapreneurship to test how the conversion of employees' self-efficacy and creativity into intrapreneurial intentions depends on the level of fit between individual- and unit-level perceptions of uncertainty avoidance and their countries' stimulating or inhibiting cultural settings. This study hence clarifies the influence of uncertainty avoidance when it is simultaneously considered at the two levels, offering a more complete picture of the phenomenon than previous studies, which usually focus on only one level. In this way, we contribute an increased understanding regarding the role that uncertainty avoidance plays in corporate entrepreneurship and help to clarify the extent of this effect (Saeed et al. 2014).

This research's second contribution is that it bridges the creativity/micro-innovation and corporate-entrepreneurship fields using the theory of planned behavior (Ajzen 1991; Van Gelderen et al. 2008). The notions of creativity and entrepreneurship are seamlessly related; logically, creative individuals and ideas are necessary to entrepreneurialism, and entrepreneurs (or intrapreneurs) need to be creative to sell their ideas to their target groups. However, these ideas are often separated, which leads to a proliferation of concepts (Smith 1969; Rohan 2000); consequently, researchers are less likely to see the entire conceptual landscape and to fully understand the relationships among concepts and the theoretical similarities (or lack thereof) between them.

Third, when it comes to managerial contributions, this study's results help managers tailor their organizations' programs and strategies to strengthen their employees' intrapreneurial intentions across various cultural settings. This study further underlines the importance of carefully considering the macro-level regional approach that companies use when implementing their internal marketing strategies.

### **Theoretical Background and Hypotheses**

To achieve this study's objective, we develop a four-level conceptual framework (see Figure 1) that focuses on employees' intrapreneurial intentions using a multilevel setting. Based on the theory of planned behavior (Ajzen 1991; Van Gelderen et al. 2008) and on complementarity and supplementarity fits (Muchinsky and Monahan 1987), we conceptualize how uncertainty avoidance (both individuals' perceptions of this concept in their work units and country-level approximations of this dimension in the national culture) interacts with the effects that creativity and self-efficacy have on intrapreneurial intentions. The following subsections are focused on developing hypotheses to support the study's framework.

- Insert Figure 1 here -

*Uncertainty Avoidance at the Individual, Group and Country Levels*

Uncertainty avoidance is relevant for development of intrapreneurial intentions because it denotes a tendency to avoid uncertain and ambiguous situations (Hofstede 1980). However, not all researchers' results point in the same direction regarding this dimension's role in intrapreneurship. Some scholars claim that people from cultures with high uncertainty avoidance are more focused on stability and security than people from cultures with low uncertainty avoidance, who tend to demonstrate higher achievement motivation and greater risk-taking behavior, and thus are more entrepreneurial (e.g., Engelen, Schmidt, and Buchsteiner 2015; Saeed et al. 2014; Kreiser et al. 2010; Hofstede 1980). Other researchers have found that cultures with low uncertainty avoidance are more entrepreneurial than cultures with high levels of uncertainty avoidance (e.g., Swierczek and Ha 2003; Eroglu and Piçak 2011). Indeed, employees in cultures that score low on uncertainty avoidance develop greater number of innovative intentions on average; in addition, high national perception of uncertainty narrows employees' radius of trust at the expense of outgroups (Bhardwaj, Dietz, and Beamish 2007).

Resolving this debate cannot be done in a simplistic manner, such as by accounting for culture only at the national level. We argue that a resolution should also account for understanding of lower-level perceptions within the culture, explaining these perceptions with information besides national-level uncertainty avoidance scores. At the individual and unit levels, high uncertainty avoidance indicates that unit members are emotional, seek security, and show high tolerance for opinions and behaviors different from their own (Sharma 2009). Low uncertainty avoidance, by contrast, indicates that unit members are relatively unemotional; seek risks; and have a need to control events, their environments, and their personal lives (Sharma 2009).

Taking both country- and unit-level uncertainty avoidance into account, we argue that, within cultures with high uncertainty avoidance, when individuals within a unit perceive high uncertainty avoidance, they are less likely to develop intrapreneurial intentions than individuals who perceive low uncertainty avoidance. In a context with high uncertainty avoidance, the individual characteristics that emphasize stability, rigidity, and risk avoidance (Sharma 2009) have a supplementarity fit (cf. Cable and Edwards 2004) with the contextual characteristics that emphasize a similarly counter-stimulating situation of corporate entrepreneurship (Elenkov and Manev 2005). Indeed, uncertainty avoidance tends to prevent prospective entrepreneurs in firms from taking risk and thinking about venturing their own projects and businesses. Such a context is made even stronger when both unit and country influences align in this regard, sending a powerful message of avoiding uncertainty. In this way, similarities between the unit- and country-level uncertainty-avoidant environments result in a negative interplay that is detrimental to attempts at fostering intrapreneurial intentions. We hypothesize the following:

*H1: Country-level uncertainty avoidance moderates the relationship between unit-level uncertainty avoidance and intrapreneurial intentions such that this relationship is negative for countries with high uncertainty avoidance but positive for countries with low uncertainty avoidance.*

#### *Self-Efficacy, Uncertainty Avoidance, and Intrapreneurial Intentions*

Self-efficacy refers to individuals' beliefs about their capability to execute a specific task within a given context (Bandura 1977; Sherer et al. 1982). When motivation processes are at work, self-efficacy determines which work behaviors employees will initiate, how much effort they will put into each task, and how long they will sustain their efforts (Bandura 1994). Previous studies show that, in general, employees with high self-efficacy have more positive work-related attitudes than employees with low self-efficacy (e.g., Luthans, Zhu, and Avoilo 2006). As such,

employees who believe in themselves and in their capabilities are more likely than employees without such beliefs to develop intentions to innovate or to be intrapreneurially oriented within their existing firms. This is because high self-efficacy involves a strong inclination to have faith in their own ideas, as well as a greater ability to persuade others to join them in their championing and ultimate implementation of prototypes that could be developed as new ventures. Self-efficacy is a common way of operationalizing perceived behavioral control in the theory of planned behavior (Van Geldern 2008; Wilson et al. 2007), and in this manner, it is linked to behavioral intentions. Therefore, any proposition that is based on logical and theoretical grounds presumes a positive association between employees' self-efficacy and their levels of intrapreneurial intentions.

Firms are nested within nations, so employees' work-related processes tend to develop and change in accordance with their work culture and the surrounding national culture (Sagiv, Schwartz, and Arieli 2010). Employees do not develop innovative or intrapreneurial intentions (or fail to do so) in a vacuum; these processes are not only driven and constrained by demographics but are also rooted in social and national contexts (Ariely 2012). National cultural differences not only account for cross-national and cross-firm variations in innovation, they also influence how employees conduct work processes within organizations. This is because cultural differences affect the inputs, processes, and outputs of innovation and entrepreneurship. Because cultural friction is situation-specific, both national- and unit-level uncertainty avoidance can strongly influence existing employees' innovation and intrapreneurship (Luo and Shenkar 2011). These effects have different effects on different types of individual-level concepts—particularly beliefs such as self-efficacy and individual characteristics such as creativity.

From the viewpoint of cultural congruence behavior, in which behavior that is consistent with cultural values is more acceptable (and therefore more likely to be exhibited) than behavior that clashes with cultural values (Dorfman and House 2004), self-efficacy should lead to different outcomes in various cultural settings at the unit and national levels. National cultural factors represent essential contexts for the interpretation of individual perceptions, attitudes, and behaviors; thus, for a model to be meaningful, it must explicitly incorporate these factors with regard to the application of self-efficacy to create potentially beneficial outcomes such as intrapreneurial intentions. In particular, when employees have high levels of self-efficacy, being in an uncertainty-avoidant environment—whether a work unit or a national culture—can be a poor fit because of that culture's general concern for security and stability. Uncertainty-avoidant settings are commonly intolerant of individuals who are confident and who take the initiative to change the status quo (e.g., Shane 1995). Group members in such contexts are likely to perceive unit members with high levels of self-efficacy as diverging from the group and as risky or even dangerous. Therefore, we expect high uncertainty avoidance at the group or country level to interfere with the effect that employees' self-efficacy has on intrapreneurial intentions. We argue that in terms of the effects of self-efficacy, no supplementary or complementarity fit can be achieved in an uncertainty-avoidant environment. In this respect, we propose that highly uncertainty-avoidant cultures and unit settings both have suppressive effects on self-efficacious individuals' intentions to initiate new projects or ventures. We thus propose the following:

*H2a: Uncertainty avoidance at the country level moderates the relationship between individual self-efficacy and intrapreneurial intentions, such that this relationship is less positive in countries with high uncertainty avoidance than in countries with low uncertainty avoidance.*



*H2b: Uncertainty avoidance at the unit level moderates the relationship between individual self-efficacy and intrapreneurial intentions, such that this relationship is less positive in units with high uncertainty avoidance than in countries with low uncertainty avoidance.*

### *Creativity, Uncertainty Avoidance, and Intrapreneurial Intentions*

Work-related creativity is an employee characteristic related to the generation of novel and potentially useful ideas (Amabile 1988). In this paper, we use the premises of the theory of planned behavior to consider the outcomes of creativity (Ajzen 1991; Van Gelderen et al. 2008). Although researchers have recently examined the process of transforming creative ideas into implemented innovations (Baer 2012; Škerlavaj, Černe, and Dysvik 2014), they typically have not investigated ways in which firms can build the foundations of entrepreneurship upon employees' existing creative capacities.

We argue in this study that the logic of linking creativity to intrapreneurial intentions is strikingly similar to that which relates creativity to implemented innovations. Namely, creativity is an individual characteristic that denotes a focus on the formation of novel and useful ideas (Amabile 1988); in this way, perceptions of creativity can also be seen as perceptions of behavioral control. Intrapreneurial intentions, on the other hand, mirror the logic of innovation, as they relate to the prospect of promotion and to the implementation of alternatives (Amabile 1988; Scott and Bruce 1994). Therefore, by combining the creativity/innovation and entrepreneurship fields using the theory of planned behavior, we show that creativity is likely to increase employees' intrapreneurial intentions.

However, the logic by which creativity and uncertainty avoidance are connected is strikingly different from that which scholars have proposed to connect self-efficacy and uncertainty avoidance. Even if uncertainty-avoidant cultures and work settings generally do not require high levels of creativity, we argue that in such contexts, a complementarity fit emerges when individuals inherently exhibit high levels of creativity. This type of P-E fit occurs when a person's characteristics provide a factor that is lacking but desired in that context. Two examples of a complementarity fit are an employee who has a skill set that is required in that employee's context (Cable and Edwards 2004) and a work context that offers employment aspects which are needed by a highly creative employee. The same complementarity-fit logic applies when conceptualizing the effects of both unit- and country-level uncertainty avoidance and their role in moderating the effect that creativity has on intrapreneurial intentions. Namely, the highly subjective norm of uncertainty avoidance can strengthen the relationship between employees' intrapreneurial intentions and their creative thoughts and actions. In such conditions, the creative skill set complements the uncertainty-avoidance norm. In fact, a creativity-inhibiting context can actually cause highly creative individuals to engage in more innovative behavior than they would in a creativity-fostering context (Černe, Kaše, and Škerlavaj 2016). Dissatisfied creators (i.e., individuals with a negative emotional experience related to creative work; Lee, Cleary, and Nembhard 2019) engage in idea generation as a constructive expression of their voices. In a context in which creative thought and expression are not valued, highly creative individuals stand out (Wilson and Stokes 2005; Niu and Kaufman 2013) and thus seek to develop their own projects or ventures. This desire is based on the fact that creative individuals (owing to their inherent originality and uniqueness) have a better starting point for such development than other individuals. We therefore propose the following hypotheses:

*H3a: Uncertainty avoidance at the country level moderates the relationship between individual creativity and intrapreneurial intentions, such that this relationship is more positive for countries with high uncertainty avoidance than for countries with low uncertainty avoidance.*

*H3b: Uncertainty avoidance at the unit level moderates the relationship between individual creativity and intrapreneurial intentions, such that this relationship is more positive for units with high uncertainty avoidance than for units with low uncertainty avoidance.*

## **Methods**

To test our hypotheses, we created a four-level data set consisting of 787 employees, grouped into 73 units within 19 small and medium enterprises (SMEs) across eight countries. Obtaining an international commercial database of SME employees was challenging; we overcame this challenge in a novel way by engaging local experts to extract the names of SMEs from their countries' local business directories (e.g., Kompas, Ajpes, and Bon.ba). We then used a three-step approach to finalize the list of SMEs in which we would administer the survey. First, we extracted a random sample of 10 SMEs from each country using a random-number generator in conjunction with numbered database records. We then contacted all 80 of these organizations; of these, 42 seriously considered administering the survey within their organizations. Finally, after several reminders, 19 SMEs agreed to administer the survey to their employees. All of these SMEs are located in their countries of origin.

Our Level 1 unit of analysis is the individual employee; we set a minimum tenure of one year at employees' firms. As a result, we invited 926 employees to participate in the survey (either online or using paper and pencil). We obtained 787 usable responses, for an 83.5% response rate. The responding employees' average age is 36 (range: 19-67), and they have an average of seven years of work experience. Furthermore, 37% of the respondents are female. When responding to the survey, the employees had to indicate their working unit; we thus grouped them into 73 units (Level 2). Employees are, on average, part of their current units for 11 years, while units have an average size of four people (range: 2-13).

For the firm-level information (Level 3), we assessed the innovativeness of each firm (asking respondents to rate their innovativeness in comparison with similar firms in their industry) on a scale from 1 to 7; the mean innovativeness was 4.75. For the country-level information (Level 4), the firms are from eight countries (Albania, Bosnia-Herzegovina, Croatia, Greece, Italy, Montenegro, Serbia, Slovenia) in the Adriatic region (one of the macro-regions of Europe). The Adriatic region is interesting because it includes some emerging countries that are generally underrepresented in the research, particularly in empirical business studies. In the same time, various EU policies are directed toward this region and identified eight countries, such as funding for European regional cooperation programs, innovation and entrepreneurship initiatives. Furthermore, although countries in the region are geographically close to each other (i.e., from Italy to Greece), they represent a diverse mix of cultures built through years of historical events. The cultural richness of the region as well as its macro relevance are hence two main reasons for the selection of the countries.

The firms in this sample are from various industries, so it is a cross-industry sample. We received 113 employee responses from the two participating Italian SMEs, a mechanical manufacturer and a producer of awnings. Both firms are fast growing and are quickly expanding in foreign markets. We received 74 responses from the two participating Slovenian SMEs, a biotechnology manufacturer and an automotive firm. The 130 employee responses from Croatia came from two SMEs: one firm that is engaged in electrical engineering and automatization, and

one in the marine sector. The 109 responses from Bosnia and Herzegovina also came from two SMEs: one in the IT software industry and one that produces pharmaceuticals. We received 100 employee responses from the two participating Serbian SMEs, an IT software firm and an automation and control-systems firm. We also received 95 responses from the two participating firms from Montenegro, an agricultural firm and a retail business. Three SMEs from Albania participated, and we received 99 employee responses. These firms are an Internet service provider, a retail business, and a firm in the furniture industry. Finally, four SMEs from Greece participated—from the beverage, bedding, food, and construction industries—and we received 67 employee responses.

To operationalize the focal constructs at Level 1, we adopted employee-level measures from established scales. We assessed creativity using items that targeted exploration and the idea-generation phase from the established scale of creativity (Zhou and George 2001). We measured self-efficacy using the scale developed by Schwarzer and Jerusalem (1995). Scholars have psychometrically tested this scale in over 25 countries (Luszczynska, Scholz, and Schwartz 2005; Scholz et al. 2002). We measured the dependent variable, intrapreneurial intentions, using the scale that Douglas and Fitzsimmons (2013) developed. This measure is distinct from entrepreneurial intentions (Douglas and Fitzsimmons 2013) and from both creativity and self-efficacy (Ahlin, Drnovšek, and Hisrich 2014).

The Level 1 controls were the employees' genders, ages, education levels, and work experience. The focal Level 2 construct was unit-level uncertainty avoidance—an aggregate of individual-level uncertainty avoidance (Dorfman and Howell 1988). The Level 2 controls were the units' tenure and size. There were no focal constructs for Level 3, but we did control for firm-level innovativeness—the aggregated response for all the firm's employees to the item "I come up with new and practical ideas to improve performance in my firm."

For the Level 4 indicators, we selected national-level uncertainty avoidance using the scores from Hofstede's research program (Hofstede, Hofstede, and Minkov 2010), which are current because changes in national culture occur very slowly. It is important to note that researchers have further tested uncertainty avoidance across European nations, obtaining a close replication of Hofstede's uncertainty-avoidance levels, showing strong face validity and internal reliability and indicating predictive properties that are similar to the original measure (Minkov and Hofstede 2014). The variance in uncertainty avoidance for the eight countries of the Adriatic Region is 213.68, which captures almost 50% of the variance in Hofstede's complete sample; this is also comparable with the variance for similar regions around the world.

For countries with no directly available indicators (e.g., Albania or Bosnia and Herzegovina), we imputed the values of indicators using neighboring countries' averages as representative values (for similar approaches, see Hohenberg and Homburg 2016; Petersen, Kushwaha, and Kumar 2015). The Level 4 controls were the country's education level and its amount of research and development expenditures; we added these controls to account for noncultural differences among countries (Hohenberg and Homburg 2016).

## **Results**

### *Assessment of the Measures*

We tested the psychometric properties of all the scales used in this study and for all eight countries through confirmatory factor analysis, using LISREL 8.71 software. The confirmatory factor analysis results show that all the scales exhibit sufficient psychometric properties; the values for composite reliability and average variance are higher than the suggested cutoff values

(Bagozzi and Yi 2012). In accordance with similar international research, a proper assessment of measurement invariance in a sample of eight countries would require huge sample sizes (see Hohenberg and Homburg 2016), so we created two categories of countries that “share a similar cultural and economic background” (Tellis, Prabhu, and Chandy 2009, p. 18) and conducted a measurement-invariance assessment across these groups (Steenkamp and Baumgartner 1998). The results of this assessment indicate that cross-national measurement variance is not a problem in this study, so we merged all the data sets into one and performed additional confirmatory factor analysis (Table 1) to test the reliability and validity of the measures in the merged sample.

- Insert Table 1 here -

To evaluate the reliability of the constructs, we assessed convergent and discriminant validity. The factor loadings for all the constructs were high and significant ( $p > 0.01$ ), and all of the average-variance-extracted values were above the 50% cutoff criteria (Fornell and Larcker 1981); this indicates that the constructs have convergent validity. The composite reliability values were also well above the critical level of 0.60. We confirmed the discriminant validity (see Table 2) by determining that the shared variance of the constructs was not larger than the average variance extracted for all constructs (Fornell and Larcker 1981).

- Insert Table 2 here -

Although common-method variance is likely not a problem for this study, as it includes variables obtained from two sources (Podsakoff, MacKenzie, and Podsakoff 2012)—the respondents’ answers and national records of cultural dimensions—we used two techniques to prevent this variance: procedural and statistical (Bagozzi 2011). We applied the procedural remedies within the research design. To address the potential for common-method variance, we differentiated scale characteristics throughout the survey, including for scale type, the number of scale points (5, 7, or 9), the anchor labels, and polarity. In addition, we advised respondents that there were no good or bad answers and that only their opinions mattered; this helped to reduce evaluation apprehension. Moreover, we scattered reflective items throughout the questionnaire so that respondents could not identify the underlying concepts of interest.

Furthermore, even though scholars have argued that common-method variance occurs more often in simple models than in complex theory-driven models with interaction effects such as the one used in this study (Chang, van Witteloostuijn, and Eden 2010), we applied statistical remedies to test for this variance. For instance, we performed Harman’s single-factor test (Podsakoff and Organ 1986) using data sets from all eight countries, and each country’s results suggested an unacceptable model fit. Next, to control for systematic measurement error in the relationships between the latent constructs, we used a merged data set to include a single unmeasured latent factor in the baseline structural equation model (Model 3a in Podsakoff, MacKenzie, Lee, and Podsakoff 2003). By comparing the baseline model without the unmeasured latent factor to the baseline model with that factor, we controlled for the portion of the variance in the indicators that is attributable to the measures being from the same source. This comparison’s results confirm that the overall pattern of significant relationships is the same in both models. These tests together suggest that there are likely no serious problems with common-method variance in our data (Hulland, Baumgartner, and Smith 2017).

### *Assessment of Hypotheses*

Our data set is, at levels 3 and 4 at least, relatively small for conducting multilevel analysis; however, researchers on sample size’s role in multilevel modeling (e.g., Bell, Morgan,

Schoenenberg, Kromrey, and Ferron 2014; Maas and Hox 2005) have recently demonstrated that estimates of regression coefficients are not biased in samples with few higher-level units.

We used hierarchical linear modeling (HLM v.7.01 software) to test for the hypothesized cross-level effect (Hox 2010). Based on recommendations from multilevel methodology researchers (e.g., Hohenberg and Homburg 2016), we centered all Level 1, Level 2, and Level 3 predictors on the group means but centered the Level 4 variables on the grand mean. To test the conceptual framework, we then completed several multilevel models (see Table 3 for the model equations that we used). We first ran an intercept-only model with intrapreneurial intentions as a dependent variable (Hox 2010). The overall mean of intrapreneurial intentions was significant ( $\delta = 4.10$ ;  $p < 0.001$ ), and the interclass correlation coefficients were 1, 4, and 6% for Levels 2, 3, and 4, respectively (indicating the level of variance explained at each of the higher levels). Furthermore, we determined the  $r_{WG(j)}$  coefficients for the variables of interest (based on the calculation approach of Castro 2002). These were 0.87 for uncertainty avoidance at Level 2 and 0.96 for firm innovativeness at Level 3.

- Insert Table 3 here -

We then ran a baseline model without higher-level interactions. Finally, we tested a full conceptual model by first introducing the Level 2 direct and interaction effects, with a focus on unit-level uncertainty avoidance, as Model A. Then, we added the Level 3 and Level 4 effects, with a focus on the interaction of unit-level and country-level uncertainty avoidance, as Model B. Finally, we focused on the Level 4 interaction effects with the model's main relationships as Model C. The results of this multilevel analysis are presented in Table 4.

- Insert Table 4 here -

These results show that all the models are stable in terms of direct effects. For the baseline model, we found support for the hypothesis that creativity ( $\delta = 0.31$ ,  $p < 0.001$ ) and self-efficacy ( $\delta = 0.27$ ,  $p < 0.001$ ) are positively related to intrapreneurial intentions. For the effects of the Level 1 control variables, gender ( $\delta = 0.36$ ,  $p < 0.05$ ), age ( $\delta = -0.03$ ,  $p < 0.001$ ), and education level ( $\delta = 0.35$ ,  $p < 0.001$ ) are significantly related to intrapreneurial intentions, but work experience ( $\delta = -0.01$ ,  $p > 0.1$ ) is not. At Level 2 (Model A), the unit-level uncertainty avoidance was not significantly related to intrapreneurial intentions ( $\delta = 0.22$ ,  $p > 0.1$ ). However, both tested interaction effects were significant, as unit-level uncertainty avoidance both suppressed the relationship between self-efficacy and intrapreneurial intentions ( $\delta = -0.47$ ,  $p < 0.05$ ) and enhanced the relationship between creativity and intrapreneurial intentions ( $\delta = 0.44$ ,  $p < 0.001$ ). Therefore, both H2b and H3b are supported. Neither of the Level 2 controls (unit tenure or unit size) was significant in the model.

For the firm and country levels, we first considered the results for Model B. Country-level uncertainty avoidance was not directly related to intrapreneurial intentions ( $\delta = 0.01$ ,  $p > 0.1$ ), nor did it interact with unit-level uncertainty avoidance ( $\delta = -0.01$ ,  $p > 0.1$ ) in predictions of intrapreneurial intentions; thus, H1 was not supported. None of the controls for Level 3 (firm innovativeness) or Level 4 (national education level and amount of research and development expenditures) were significant.<sup>1</sup>

Finally, as can be seen in Model C, the country-level interaction of uncertainty avoidance with the relationship between self-efficacy ( $\delta = 0.01$ ,  $p > 0.1$ ) and intrapreneurial intentions was not significant; thus, H2a was not supported. Likewise, country-level uncertainty avoidance did

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<sup>1</sup> At Level 3, we also controlled for potential differences between service and non-service firms and between high-tech and low-tech firms; the results with the additional controls do not reveal any meaningful variance.

not moderate the relationship between creativity ( $\delta = -0.01$ ,  $p > 0.1$ ) and intrapreneurial intentions, so H3a was not supported. Interestingly, Model C (which assumes the presence of country-level terms that interact with the Level 1 main effects) showed different main effects of self-efficacy and creativity compared to the other models. Specifically, in Model C, the main self-efficacy effect was nonsignificant ( $\delta = 0.20$ ,  $p > 0.1$ ), whereas the effect of creativity on intrapreneurial intentions was 2.6 times stronger than in the other models ( $\delta = 0.81$ ,  $p < 0.05$ ). These results support the hypothesized relationships in the country-level interactions. That is, country-level uncertainty avoidance strengthens the effect that creativity has on intrapreneurial intentions but weakens the effect that self-efficacy has on intrapreneurial intentions. However, due to the insignificance of interaction terms, these results cannot be statistically interpreted.<sup>2</sup>

Therefore, regarding the cross-level interactions, we cannot draw any conclusions about the effects that country-level uncertainty avoidance has on self-efficacy or creativity. However, unit-level uncertainty avoidance makes a difference in the relationships that self-efficacy and creativity have with intrapreneurial intentions. Namely, in units with high uncertainty avoidance, individual employees with high creativity have a greater influence on the unit's intrapreneurial intentions than employees with low creativity. Similarly, individual employees' self-efficacy has less influence on a unit's intrapreneurial intentions if it has high uncertainty avoidance than if the unit is comfortable with ambiguous situations. These interaction effects are illustrated in Figures 2 and 3.

- Insert Figure 2 here -

- Insert Figure 3 here -

## Discussion and Conclusions

The results of this multilevel study include several specific findings on the joint role that individual factors (self-efficacy and creativity) and cultural factors (uncertainty avoidance at the unit and country levels) have in shaping intrapreneurial intentions. In particular, following the underpinnings of the P-E fit paradigm (Endler and Magnusson 1976; Pervin 1989; Schneider 1987), we found no support for the hypothesis that the interplay between unit- and country-level uncertainty avoidance suppressed the development of intrapreneurial intentions. The interplay of unit-level and national cultural perceptions in itself did not seem to be important enough to predict the development of intrapreneurial intentions. However, when individuals are high in either creativity or self-efficacy, their contexts do matter. In both cases, this speaks to the importance of the complementarity fit (Cable and Edwards 2004) between the individual and the context, such that the elements of the unit culture regarding uncertainty avoidance complement the individual's characteristics. In the case of creativity, this complementary effect is positive, as creative individuals seem to be particularly prominent when in uncertainty-avoidant units. However, self-efficacy has the opposite effect. This finding contrasts with one from a previous study (Wennberg, Pathak, and Autio 2013), in which national cultures that were more predominantly inclined toward uncertainty avoidance had stronger positive associations between self-efficacy and entrepreneurial entry. It remains to be assessed in future research whether these differences are really consistent or arise from differences in the design of the studies. The same propositions apparently cannot be applied to the role that either unit-level or national uncertainty

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<sup>2</sup> We also tested the three-way interaction as a post-hoc analysis to determine whether the effect that unit-level uncertainty avoidance has on the relationships between creativity or self-efficacy and intrapreneurial intentions varies based on the level of national uncertainty avoidance. However, we found no significant effect.

avoidance has in the relationship between self-efficacy and employees' intrapreneurial intentions to develop their own projects. The units' cultural contexts seem to be more powerful than the national cultural contexts, so the same principles of distal effects cannot be applied at both levels. Below, we discuss the theoretical and practical implications of the abovementioned findings.

### *Theoretical Contributions*

This study's first theoretical contribution is the application of the P-E fit paradigm (Endler and Magnusson 1976) with a focus on the role of the fit between the unit and national cultural characteristics. The results help resolve previous researchers' inconsistent findings about the role that uncertainty avoidance plays in the formation of intrapreneurial intentions. In this four-level cross-cultural study, we provided a thorough examination of the role that both national and unit-level uncertainty-avoidant cultural contexts play, and by doing so, we addressed various calls for research (e.g., Fitzsimmons and Douglas 2011; Douglas and Fitzsimmons 2013). This approach complements the examination of the importance of fit in internal organizational environments (Hornsby et al. 2002) with a consideration of the contextual influence of the broader cultural context while accounting for unit-level culture as well.

Specifically, we could not confirm that within uncertainty-avoidant national contexts, uncertainty-avoidant units are less likely than uncertainty-seeking units to develop intrapreneurial intentions. However, by simultaneously accounting for individual perceptions of unit culture and national culture, we went beyond merely examining the fit (or lack thereof) that potential intrapreneurs have with their firms' internal environments in ways directly related to intrapreneurship (cf. Hornsby et al. 2002); we also examined another potentially stimulating or inhibiting contextual factor. Nonetheless, this study's findings do not mean that national-level contexts are of particular importance above and beyond internal ones. Although national culture in general, and uncertainty avoidance specifically, can foster creativity, innovation, and entrepreneurial orientation (e.g., Sarooghi et al. 2015; Saeed et al. 2014), this study's results do not support adding intrapreneurial intentions to the mix of outcomes that national cultural context heavily constrains. This finding could influence further research because it highlights the fact that focusing on individual perceptions of national culture (in our case, at the unit level) is more important than relying on relatively flawed country-level scores, which can limit understanding of work phenomena. This finding is also completely in line with one of the general principles of multilevel theory, in which Klein and Kozlowski (2000) asserted that proximal cross-level relationships are more meaningful for individual-level processes and outcomes than for distal ones. By accounting for prospective intrapreneurs' unit contexts, researchers should further embrace an approach that considers the fit between individuals and their immediate environments, as well as what the complementary or complementarity fit represents in employees' individual-level processes.

This study's second contribution is that it bridges the creativity/micro-innovation and corporate-entrepreneurship fields using the theoretical underpinning of the theory of planned behavior, similar to what other researchers have done in the field of entrepreneurship more generally (cf. Ahlin et al. 2014; Aldrich et al. 2015). The fact that these areas of research are so loosely coupled leads to a proliferation of concepts (Rohan 2000), which in turn means that researchers are less likely to see the entire conceptual landscape or to fully understand the relationships between concepts and the level of theoretical similarity between them. Researchers of entrepreneurship, in particular, should embrace the influx of research in the fields of creativity

and innovation, as these studies are much more strongly founded in organizational psychology and sociology (Černe et al. 2016) than in the entrepreneurship field. In line with this notion, our results indicate that the roles of unit-level and national uncertainty avoidance in intrapreneurship are not necessarily mutually constraining and could be offset by employees who possess certain proactive characteristics (e.g., self-efficacy and creativity) that favor intrapreneurship.

In particular, this study's results indicate the importance of being precise and accurate when interpreting the interrelationships among creativity, self-efficacy, and uncertainty avoidance at various levels. Although we did not find that country-level uncertainty avoidance moderates individual-level relationships, we did find that individual perceptions of unit-level uncertainty avoidance positively moderate the relationship between creativity and intrapreneurial intentions but negatively moderate the relationship between self-efficacy and intrapreneurial intentions. These findings reveal the differential nature of the P-E fit (Muchinsky and Monahan 1987) that is needed for the development of intrapreneurial intentions when divergent elements from the micro-innovation realm are present. Creativity seems to be powerful when in complementarity with uncertainty avoidance at the unit level, but self-efficacy seems to be suppressed by this factor. However, the direct effect of creativity at the individual level was enhanced when we included the broader context of country-level uncertainty avoidance in the model. On the other hand, the direct effect of self-efficacy was redundant when national cultural context was included. In this sense, individuals with high creativity do not suffer from a constraining national culture, but rather supplement the missing elements of such a culture. Driven by their creative efforts and ideas, these individuals develop intrapreneurial intentions in a direct manner.

### *Practical Implications*

This study also has several implications for managers. Due to increased turnover and the high costs associated with hiring, training, and acculturating new employees, companies are heavily dependent on their managers' ability to motivate and retain personnel (Darmon 1990). On this front, internal marketing plays a crucial role in creating a working atmosphere that motivates and encourages employees to create, coordinate, and improve the entire business. Various marketing and human resources techniques can be used to direct employees to facilitate the implementation of organizational objectives (Boukis and Gounaris 2014; Tortosa et al. 2009). One of the aims of such internal marketing activities should be to develop intrapreneurship among employees, as doing so revitalizes a firm and improves its performance (Antoncic and Hisrich 2003). By augmenting previous findings (e.g., Sun and Pan 2011), we offer a spectrum of nuanced findings. For instance, in order to develop employees' intrapreneurial intentions, internal marketing activities should be focused on developing employees' creativity and self-efficacy by specifically accounting for the cultures within firms, for example in individual teams and units. Furthermore, it is crucial that managers focus on employees' cognitive, motivational, and behavioral processes related to creativity and self-efficacy so as to stimulate organizational renewal and boost employees' intrapreneurial intentions. Companies achieve better business results when their employees produce extraordinary innovations.

In addition, this study's results confirm that the one-size-fits-all principle does not apply in this context, as well as that activities that are meant to encourage intrapreneurial intentions should be adapted across various cultural contexts to account for either supplementary or complementary fit, depending on country- and unit-level cultural factors. Managers should thus measure their employees' levels of uncertainty avoidance and relate these results to their national



cultural settings, as this will help them understand the effects that their employees' creativity and self-efficacy can have on the development of intrapreneurial intentions.

#### *Limitations and Future Research Directions*

This study is not without limitations. It is cross-sectional, and the majority of its measures are self-reported. Future researchers could tackle the same issues by applying longitudinal or experimental research and by using research designs that allow for data on individual (or organizational) uncertainty avoidance to be collected (e.g., from employees' superiors or coworkers). Furthermore, to supplement this study's outcome variable, intrapreneurial intentions, further insights into the real behaviors and actions of corporate entrepreneurs would be very beneficial. This study's sample size at Level 4 (just eight countries) is also a key limitation. However, the representative samples at all three of the lower levels do allow for robust estimations and interpretations of the results.

Additionally, at the country level, all the countries in the sample are in the same region, so there is relatively little variance in terms of uncertainty avoidance (about 50% of the total variance). Apart from increasing the number of sampled countries, further researchers should also aim to produce a sample with greater variation in the cultural dimension. In this way, future researchers will also be able to test whether unit-level uncertainty avoidance is indeed more important for intrapreneurship than country-level uncertainty avoidance, as our study's results suggest. Furthermore, in this study, we focused only on Hofstede's work. Using some other cultural classifications (e.g., Schwartz 1990; House et al. 2004) could help overcome the well-known criticism of Hofstede's conceptualizations and measures (e.g., Dorfman and Howell 1988; Kirkman, Lowe, and Gibson 2006; Taras et al. 2010). Another limitation is related to the availability of the existing measures, as there could be differences in the conceptualizations of uncertainty avoidance at the unit level and the country level. Hofstede (1980), in his societal conceptualization, described a general pattern of inclinations and behaviors within the members of a society. This approach treats national culture as universal and disregards potential within-country cultural heterogeneity. Therefore, this study's findings should be interpreted in light of these imperfect conceptual definitions and multilevel operationalizations of uncertainty avoidance.

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**FIGURES AND TABLES**  
Figure 1: Conceptual model

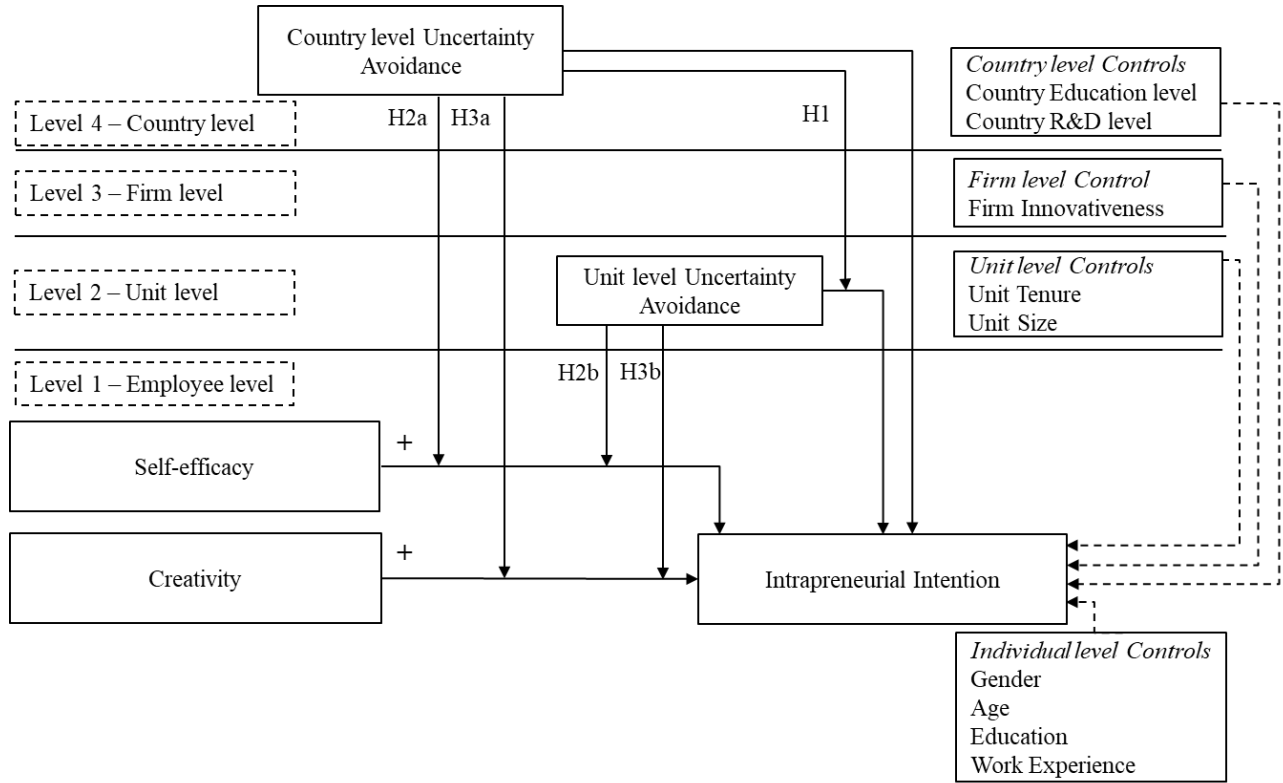




Figure 2: Illustration of the effect for self-efficacy and intrapreneurial intentions relationship

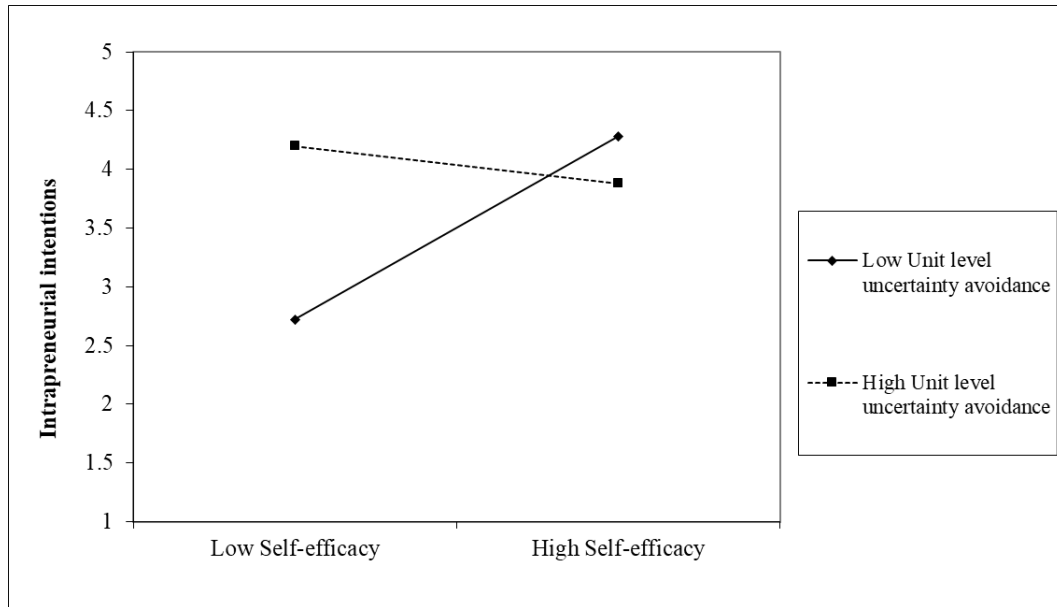


Figure 3: Illustration of the effect for creativity and intrapreneurial intentions relationship

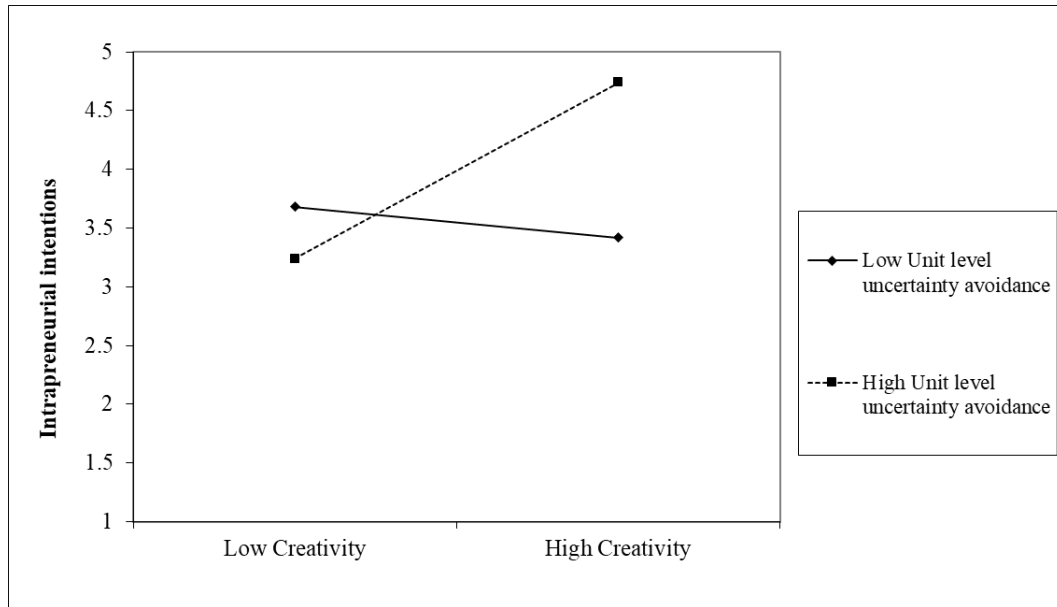


Table 1: Confirmatory factor analysis

Item	Loading	CR	$\alpha$	AVE
<i>Creativity</i>				
I come up with new and practical ideas to improve performance.	0.849	0.891	0.876	0.621
I search out new technologies, processes, techniques, and/or product ideas.	0.792			
I suggest new ways to increase quality.	0.838			
I suggest new ways of performing work tasks.	0.787			
<i>Self-efficacy</i>				
It is easy for me to stick to my aims and accomplish my goals.	0.737	0.940	0.939	0.663
Thanks to my resourcefulness, I know how to handle unforeseen situations.	0.846			
I can solve most problems if I invest the necessary effort.	0.830			
When I am confronted with a problem, I can usually find several solutions.	0.885			
If I am in trouble, I can usually think of a solution.	0.926			
I can usually handle whatever comes my way.	0.872			
<i>Intrapreneurial intentions</i>				
<i>How likely is it that you would want to manage (within your employer's business) a new division (or branch)...</i>				
... that is set up to exploit a radical innovation?	0.855	0.942	0.941	0.845
... set up to introduce a new variant of an existing product or service?	0.957			
... set up to introduce an existing product into a new market?	0.942			
<i>Uncertainty Avoidance</i>				
Managers expect employees to closely follow instructions and procedures.	0.746	0.935	0.895	0.829
Instructions for operations are important for employees on the job.	0.957			
It is important to have job instructions spelled out in detail so that employees	0.885			
always know what they are expected to do.				
<b>CFA Model fit:</b> $\chi^2 = 304.02$ ; df = 113; p=0.000; RMSEA = 0.046; NNFI = 0.988; CFI = 0.990; SRMR = 0.031; GFI = 0.956				
Notes: CR = Composite reliability; $\alpha$ = Cronbach's Alpha; AVE = Average variance extracted				

Table 2: Correlation matrix and discriminant validity

#	Construct	Mean (SD)	1	2	3	4	5	6	7	8
1	Creativity	4.597 (1.383)	<b>0.788</b>							
2	Intrapreneurial intentions	4.075 (1.729)	0.302	<b>0.813</b>						
3	Self-efficacy	5.132 (1.295)	0.525	0.228	<b>0.919</b>					
4	Individual level Uncertainty Avoidance	5.423 (1.565)	0.249	0.057	0.589	<b>0.910</b>				
5	Gender	-	0.089	0.111	0.035	-0.047	-			
6	Age	35.93 (9.38)	0.036	-0.237	-0.033	0.025	0.028	-		
7	Education	-	0.231	0.141	0.145	-0.054	0.046	-0.064	-	
8	Work Experience	6.570 (6.576)	0.037	-0.193	-0.050	-0.067	-0.003	0.544	-0.093	-
Note: Correlations are below diagonal; Squared-root AVEs are on the diagonal in bold;										

Table 3: Model equations

Notation	Equation
Intercept-only model equation	$INTRAP_{ijkl} = \delta_{0000} + r_{0jkl} + u_{00kl} + v_{000l} + e_{ijkl}$
Baseline model equation	$INTRAP_{ijkl} = \delta_{0000} + \delta_{1000} * G_{ijkl} + \delta_{2000} * A_{ijkl} + \delta_{3000} * EDU_{ijkl} + \delta_{4000} * WE_{ijkl} + \delta_{5000} * CRE_{ijkl} + \delta_{6000} * SELFE_{ijkl} + r_{0jkl} + u_{00kl} + v_{000l} + e_{ijkl}$
Model A equation	$INTRAP_{ijkl} = \delta_{0000} + \delta_{0100} * UNIT\_UNA_{jkl} + \delta_{0200} * DT_{jkl} + \delta_{0300} * DS_{jkl} + \delta_{1000} * G_{ijkl} + \delta_{2000} * A_{ijkl} + \delta_{3000} * EDU_{ijkl} + \delta_{4000} * WE_{ijkl} + \delta_{5000} * CRE_{ijkl} + \delta_{5100} * CRE_{ijkl} * UNIT\_UNA_{jkl} + \delta_{6000} * SELFE_{ijkl} + \delta_{6100} * SELFE_{ijkl} * UNIT\_UNA_{jkl} + r_{0jkl} + u_{00kl} + v_{000l} + e_{ijkl}$
Model B equation	$INTRAP_{ijkl} = \delta_{0000} + \delta_{0001} * UNCA_l + \delta_{0002} * EDUIN_l + \delta_{0003} * RD_l + \delta_{0010} * ORG\_CII2_{kl} + \delta_{0100} * UNIT\_UNA_{jkl} + \delta_{0101} * UNIT\_UNA_{jkl} * UNCA_l + \delta_{0200} * DT_{jkl} + \delta_{0300} * DS_{jkl} + \delta_{1000} * G_{ijkl} + \delta_{2000} * A_{ijkl} + \delta_{3000} * EDU_{ijkl} + \delta_{4000} * WE_{ijkl} + \delta_{5000} * CRE_{ijkl} + \delta_{6000} * SELFE_{ijkl} + r_{0jkl} + u_{00kl} + v_{000l} + e_{ijkl}$
Model C equation	$INTRAP_{ijkl} = \delta_{0000} + \delta_{0001} * UNCA_l + \delta_{0002} * EDUIN_l + \delta_{0003} * RD_l + \delta_{0010} * ORG\_CII2_{kl} + \delta_{0100} * UNIT\_UNA_{jkl} + \delta_{0200} * DT_{jkl} + \delta_{0300} * DS_{jkl} + \delta_{1000} * G_{ijkl} + \delta_{2000} * A_{ijkl} + \delta_{3000} * EDU_{ijkl} + \delta_{4000} * WE_{ijkl} + \delta_{5000} * CRE_{ijkl} + \delta_{5001} * CRE_{ijkl} * UNCA_l + \delta_{6000} * SELFE_{ijkl} + \delta_{6001} * SELFE_{ijkl} * UNCA_l + r_{0jkl} + u_{00kl} + v_{000l} + e_{ijkl}$

where:  $INTRAP_{ij}$  is *intrapreneurial intention* (dependent variable) for observation  $i$  (Level 1) in unit  $j$  (Level 2), firm  $k$  (Level 3), country  $l$  (Level 4),  $\delta_{0000}$  is the fixed regression coefficient for the intercept of the regression equation,  $r_{0jkl}$  is random regression coefficient for the intercept of the regression equation for group  $j$  (Level 2, unit level),  $u_{00kl}$  is random regression coefficient for the intercept of the regression equation for group  $k$  (Level 3, firm level),  $v_{000l}$  is random regression coefficient for the intercept of the regression equation for group  $l$  (Level 4, country level),  $e_{ijkl}$  is random regression coefficient for the intercept of the regression equation at the individual level;  $G_{ijkl}$  is *employee gender* (Level 1, individual level control) for observation  $i$  in groups  $jkl$ ,  $\delta_{1000}$  is the fixed regression coefficient for the employee gender effect,  $A_{ijkl}$  is *employee age* (Level 1, individual level control) for observation  $i$  in groups  $jkl$ ,  $\delta_{2000}$  is the fixed regression coefficient for the employee age effect,  $EDU_{ijkl}$  is *employee education level* (Level 1, individual level control) for observation  $i$  in groups  $jkl$ ,  $\delta_{3000}$  is the fixed regression coefficient for the employee education effect,  $WE_{ijkl}$  is *employee work experience* (Level 1, individual level control) for observation  $i$  in groups  $jkl$ ,  $\delta_{4000}$  is the fixed regression coefficient for the employee work experience effect,  $CRE_{ijkl}$  is *creativity* (Level 1, individual level predictor) for observation  $i$  in groups  $jkl$ ,  $\delta_{5000}$  is the fixed regression coefficient for the creativity effect,  $SELFE_{ijkl}$  is *self-efficacy* (Level 1, individual level predictor) for observation  $i$  in groups  $jkl$ ,  $\delta_{6000}$  is the fixed regression coefficient for the self-efficacy effect,  $UNIT\_UNA_{jkl}$  is *unit level uncertainty avoidance* (Level 2) for unit  $j$  in groups  $kl$ ,  $\delta_{0100}$  is the fixed regression coefficient for the unit level uncertainty avoidance effect,  $DT_{jkl}$  is *unit tenure* (Level 2, unit level control) for observation  $j$  in groups  $kl$ ,  $\delta_{0200}$  is the fixed regression coefficient for the unit tenure effect,  $DS_{jkl}$  is *unit size* (Level 2, unit level control) for observation  $j$  in groups  $kl$ ,  $\delta_{0300}$  is the fixed regression coefficient for the unit size effect,  $CRE_{ijkl} * UNIT\_UNA_{jkl}$  is *cross-level interaction* between the individual level creativity for observation  $i$  in groups  $jkl$  and uncertainty avoidance for unit  $j$  in groups  $kl$ ;  $\delta_{5100}$  is the fixed regression coefficient for the cross-level interaction between creativity and unit level uncertainty avoidance;  $SELFE_{ijkl} * UNIT\_UNA_{jkl}$  is *cross-level interaction* between the individual level self-efficacy for observation  $i$  in groups  $jkl$  and uncertainty avoidance for unit  $j$  in groups  $kl$ ;  $\delta_{6100}$  is the fixed regression coefficient for the cross-level interaction between self-efficacy and unit level uncertainty avoidance;  $ORG\_CII2_{kl}$  is *firm innovativeness* (Level 3, firm level control) for observation  $k$  in group  $l$ ,  $\delta_{0010}$  is the fixed regression coefficient for the firm innovativeness effect,  $UNCA_l$  is *country level uncertainty avoidance* (Level 4, country level predictor) for group  $l$ ,  $\delta_{0001}$  is the fixed regression coefficient for the country level uncertainty avoidance effect,  $EDUIN_l$  is *country education level* (Level 4, country level control) for group  $l$ ,  $\delta_{0002}$  is the fixed regression coefficient for the country education level effect,  $RD_l$  is *country research and development level* (Level 4, country level control) for group  $l$ ,  $\delta_{0003}$  is the fixed regression coefficient for the country research and development level,  $UNIT\_UNA_{jkl} * UNCA_l$  is *cross-level interaction* between the unit level uncertainty avoidance for unit  $j$  in groups  $kl$  and uncertainty avoidance for country  $l$ ,  $\delta_{0101}$  is the fixed regression coefficient for the cross-level interaction between unit level uncertainty avoidance and country level uncertainty avoidance,  $CRE_{ijkl} * UNCA_l$  is *cross-level interaction* between the individual level creativity for observation  $i$  in groups  $jkl$  and uncertainty avoidance for country  $l$ ,  $\delta_{5001}$  is the fixed regression coefficient for the cross-level interaction between individual level creativity and country level uncertainty avoidance,  $SELFE_{ijkl} * UNCA_l$  is *cross-level interaction* between the individual level self-efficacy for observation  $i$  in groups  $jkl$  and uncertainty avoidance for country  $l$ ,  $\delta_{6001}$  is the fixed regression coefficient for the cross-level interaction between individual level self-efficacy and country level uncertainty avoidance.

Table 4: Hypotheses testing

Variables	Intercept-only model	Baseline model	Model A	Model B	Model C
Intercept	4.10*** (0.18)	3.76*** (0.40)	3.77*** (0.40)	0.36 <sup>NS</sup> (4.92)	0.46 <sup>NS</sup> (4.89)
<b>Level 1: Employees</b>					
Self-efficacy		0.27*** (0.06)	0.27*** (0.06)	0.27*** (0.06)	0.20 <sup>NS</sup> (0.06)
Creativity		0.31*** (0.05)	0.31*** (0.05)	0.31*** (0.05)	0.81** (0.37)

<i>Controls (Level 1)</i>					
Gender	0.36 <sup>**</sup> (0.12)	0.37 <sup>***</sup> (0.12)	0.37 <sup>***</sup> (0.12)	0.37 <sup>***</sup> (0.12)	0.37 <sup>***</sup> (0.12)
Age	-0.03 <sup>***</sup> (0.01)	-0.03 <sup>***</sup> (0.01)	-0.03 <sup>***</sup> (0.01)	-0.03 <sup>***</sup> (0.01)	-0.03 <sup>***</sup> (0.01)
Education	0.35 <sup>***</sup> (0.08)	0.35 <sup>***</sup> (0.08)	0.36 <sup>***</sup> (0.08)	0.36 <sup>***</sup> (0.08)	0.36 <sup>***</sup> (0.08)
Work experience	-0.01 <sup>NS</sup> (0.01)	-0.01 <sup>NS</sup> (0.01)	-0.01 <sup>NS</sup> (0.01)	-0.01 <sup>NS</sup> (0.01)	-0.01 <sup>NS</sup> (0.01)
<b>Level 2: Units</b>					
Unit level uncertainty avoidance		0.22 <sup>NS</sup> (0.18)	0.41 <sup>NS</sup> (1.87)	0.22 <sup>NS</sup> (0.18)	
<i>Cross-level interactions</i>					
Self-efficacy x Unit level uncertainty avoidance		-0.47 <sup>**</sup> (0.22)			
Creativity x Unit level uncertainty avoidance		0.44 <sup>***</sup> (0.17)			
<i>Controls (Level 2)</i>					
Unit tenure		-0.01 <sup>NS</sup> (0.01)	-0.01 <sup>NS</sup> (0.01)	-0.01 <sup>NS</sup> (0.01)	-0.01 <sup>NS</sup> (0.01)
Unit size		-0.03 <sup>NS</sup> (0.05)	-0.03 <sup>NS</sup> (0.05)	-0.02 <sup>NS</sup> (0.05)	-0.02 <sup>NS</sup> (0.05)
<b>Level 3: Firms</b>					
<i>Controls (Level 3)</i>					
Firm innovativeness			-0.03 <sup>NS</sup> (0.22)	-0.03 <sup>NS</sup> (0.22)	
<b>Level 4: Countries</b>					
Country level uncertainty avoidance			0.01 <sup>NS</sup> (0.01)	0.01 <sup>NS</sup> (0.01)	
<i>Cross-level interactions</i>					
Unit level uncertainty avoidance x Country level uncertainty avoidance			-0.01 <sup>NS</sup> (0.03)	-0.01 <sup>NS</sup> (0.03)	
Self-efficacy x Country level uncertainty avoidance				0.01 <sup>NS</sup> (0.01)	
Creativity x Country level uncertainty avoidance				-0.01 <sup>NS</sup> (0.01)	
<i>Controls (Level 4)</i>					
Country education level			-0.61 <sup>NS</sup> (1.48)	-0.59 <sup>NS</sup> (1.47)	
Country R&D level			-0.26 <sup>NS</sup> (0.31)	-0.25 <sup>NS</sup> (0.31)	
<b>Model information</b>					
Level 4: Country ( $\sigma^2_v$ )	0.18 <sup>***</sup> (0.43)	0.18 <sup>***</sup> (0.43)	0.17 <sup>***</sup> (0.41)	0.12 <sup>***</sup> (0.35)	0.12 <sup>***</sup> (0.35)
Level 3: Firm ( $\sigma^2_u$ )	0.13 <sup>***</sup> (0.36)	0.13 <sup>***</sup> (0.36)	0.12 <sup>***</sup> (0.35)	0.12 <sup>***</sup> (0.35)	0.12 <sup>***</sup> (0.35)
Level 2: Unit ( $\sigma^2_r$ )	0.01 <sup>*</sup> (0.07)	0.01 <sup>*</sup> (0.07)	0.01 <sup>*</sup> (0.07)	0.01 <sup>*</sup> (0.05)	0.01 <sup>*</sup> (0.05)
Level 1: Employee ( $\sigma^2_e$ )	2.67 <sup>*</sup> (1.63)	2.67 <sup>*</sup> (1.63)	2.22 <sup>*</sup> (1.49)	2.24 <sup>*</sup> (1.49)	2.24 <sup>*</sup> (1.49)
Deviance (-2 log likelihood)	3035.94	2902.23	2892.02	2898.17	2896.25
Df		6	5	8	9
p		<0.001	=0.06	>0.10	>0.10
Reference		Intercept-only model	Baseline model	Baseline model	Baseline model

Notes: \*\*\* - p < 0.001, \*\* - p < 0.05, \* - p < 0.01, <sup>NS</sup> - not significant