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CONSEQUENCES OF CULTURAL PRACTICES FOR ENTREPRENEURIAL BEHAVIORS

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Abstract: Although national culture is an important regulator of entrepreneurship, there is a dearth of studies that (i) explore the effects of national cultural practices on entrepreneurial behaviors by *individuals*; (ii) use appropriate multi-level research designs; (iii) consider the effects of culture on different entrepreneurial behaviors such as entry and post-entry growth aspirations. We combined Global Entrepreneurship Monitor (GEM) and Global Leadership and Organizational Behavior Effectiveness (GLOBE) data from 42 countries for 2005 – 2008 to address these gaps using a multi-level design. We found societal institutional collectivism practices negatively associated with entrepreneurial entry but positively associated with entrepreneurial growth aspirations. Uncertainty avoidance practices were negatively associated with entry but not with growth aspirations, while performance orientation practices were positively associated with entry. This highlights the differential effects of cultural practices on entrepreneurial entry and growth aspirations, and demonstratesthe value of multi-level techniques in analyzing the effect of culture on entrepreneurship.

INTRODUCTION

In recent years, evidence has accumulated that highlights important cross-country variation in entrepreneurial entry rates and post-entry growth aspirations (Bosma, Acs, Autio, Coduras & Levie, 2009; Autio, 2007). The disciplines of economics (Baumol, 1990; Greif, 2001), sociology (Aldrich, 2009) and international business (Stephan & Uhlaner, 2010) all recognize national culture as an important regulator of both the quality and aggregate rates of entrepreneurial entries across countries. In this study we contribute to this growing literature by considering the effect of national cultural practices on both entry into entrepreneurship and post-entry growth aspirations by individuals, using multi-level techniques to model these relationships.

Although the effect of culture on entrepreneurship has been explored quite widely, we argue that three important gaps exist in received research on the effect of national culture on entrepreneurship. First, we know of no studies applying multi-level techniques to analyze links between national culture and individual-level entrepreneurial behaviors. The received studies on the culture-entrepreneurship link have examined, on the one hand, the effect of culture on country-level rates of entrepreneurship, ignoring the critical point that entrepreneurship is fundamentally an individual-level endeavor (e.g., Stephan & Uhlaner, 2010). Other studies have measured the effect of individuals' perceptions of culture on their entrepreneurial behaviors, thereby ignoring that culture is fundamentally a collective-level construct (e.g., Mueller & Thomas, 2001; Steensma, Marino & Weaver, 2000). Such problems may be further compounded by inappropriate aggregation of data from one level to another (Peterson & Castro, 2006).We therefore argue that a multi-level approach offers the most appropriate way to test the effects of national culture on entrepreneurship.

Second, the majority of studies on culture and entrepreneurship have treated entrepreneurship as a singular entry event: either an individual becomes an entrepreneur or not, or countries have high or low rates of entrepreneurial entry (Hayton, George & Zahra, 2002). However, this conflicts with what we know empirically about entrepreneurship (Reynolds, 2007). The most consequential entrepreneurial decisions are made in post-entry situations – a phase most studies on the culture-entrepreneurship link have ignored (Autio & Acs, 2010). We still know little about how culture af-

fects post-entry resource allocation decisions, and whether the national culture exercises similar influence on different entrepreneurial behaviors such as entry and post-entry growth aspirations.

Third, with the exception of Stephan and Uhlaner (2010), no studies have explicitly explored the effect of cultural *practices* on entrepreneurship. In the GLOBE study, societal-level cultural practices are measured as common behaviors and institutional practices and prescriptions, as observed by the individual (e.g., House & Javidan, 2004). We believe that this approach provides higher fidelity with the central action theory of entrepreneurship (McMullen & Shepherd, 2006), which portrays individuals as evaluating the first-person feasibility and desirability of the pursuit of third-person opportunities for entrepreneurial action, as observed by the focal individual (Shepherd, McMullen, & Jennings, 2007). In our model, societal cultural practices condition the degree to which observed third-person opportunities (i.e., opportunities for someone) are evaluated to represent feasible and desirable first-person opportunities (i.e., opportunities for oneself), as well as the perceived feasibility and desirability of pursuing growth *post-entry*.

This study contributes beyond current literature by addressing the three gaps above. To address the dearth of multi-level studies, we outline and conduct a detailed multi-level analysis of the links between national cultural practices and entrepreneurial behaviors. Further, to highlight the nuances and merits of multi-level analysis techniques over single-level ones, we also provide a multi-level replication of a recent country-level study (Stephan & Uhlaner, 2010). Stephan and Uhlaner (2010) conducted a country-level analysis of the effect of cultural practices on various types of entry into entrepreneurship and found statistically significant influences for their 'Socially Supportive Culture' factor but not for the 'Performance-Based Culture' factor. We use essentially the same data but a multi-level design to demonstrate how multi-level research designs provide additional insight into the sources of variance (at both individual and group levels) that single-level designs are unable to provide, and how this may impact interpretations of the culture-entrepreneurship link. In terms of theory development, a multi-level design enables us to combine individual-level considerations (portrayed in terms of anticipated economic and social legitimacy costs of entrepreneurial action) with context-level considerations (portrayed in terms of group norms and the effect of cultural practices).

To address the second gap, we extend the consideration of the effect on culture to cover *both* entry *and* post-entry growth aspirations. We show that country-level cultural norms may have differential effects on these two individual-level outcomes. Third, we add to the small body of research that has considered the effect of cultural *practices* on entrepreneurial behaviors. Our study contributes by demonstrating that society-level cultural practices provide more salient predictors than cultural values of entrepreneurial behaviors by individuals.

We drew on the Global Entrepreneurship Monitor (GEM) and the GLOBE data to create a dataset for years 2005 - 2008 that covered 42 countries (House, Hanges, Javidan, Dorfman & Gupta, 2004; Reynolds et al., 2005). We used the same dataset to replicate the study by Stephan and Uhlaner (2010), who used the same datasets but aggregated to the national level, so as to compare the relative merits of multi-level and single-level analysis techniques.

Our analysis reveals that the cultural practices of societal institutional collectivism were negatively associated with individual-level entrepreneurial *entry* but positively associated with entrepreneurial growth aspirations *post entry*, reflecting the varying effect of institutional collectivism on variance-inducing and resource-mobilizing behaviors (Tiessen, 1997). This finding contrasts with the received theorizing and empirical findings that only highlight the negative effect of 'collectivism' on entrepreneurial entry. Further, we find that the cultural practices of uncertainty avoidance are negatively associated with entrepreneurial entry, while the cultural practices of performance orientation are associated positively with entrepreneurial entry. These two cultural practices do not exhibit significant effects on growth aspirations in our analyses.

In the following, we first lay out and justify our theoretical approach and key design choices. We then build and test our theoretical model. After this, we provide a replication and extension of the Stephan and Uhlaner (2010) study to explore the merits of multi-level techniques. We conclude by discussing the implications of our findings for future research and policy practice.

THEORY AND HYPOTHESES

Culture affects economic behaviors through individual-centric, collective, and societal mechanisms (Guiso, Sapienza & Zingales, 2006; Oyserman & Lee, 2008). Individual-centric mechanisms operate through cognition, beliefs, values, and the individual's needs and motivations. These mechanisms affect how individuals recognize third-person opportunities for entrepreneurial action and how they evaluate the feasibility and desirability of the pursuit of those opportunities by themselves (McMullen & Shepherd, 2006). Collective mechanisms operate through joint expectations and preferences, as well as shared behavioral and legitimacy norms. These mechanisms influence how individuals perceive the economic and social feasibility and desirability of entrepreneurial action. Societal mechanisms operate through formal and informal institutions that are shaped by cultural preferences (Greif, 2001; Witt & Redding,2008). Given the varied ways that culture is presumed to influence economic behaviors, it is not surprising that the link between culture and entrepreneurship has received wide attention from entrepreneurship scholars (Hayton et al., 2002).

Theoretical and Empirical Advantages of Multi-Level Design

Instead of summarizing previous research on culture and entrepreneurship, we point the reader towards existing reviews of this literature (e.g., Hayton et al., 2002). Here, we only highlight the most important gap that we observed in our literature review. We did not come across any studies that had applied multi-level designs when analyzing the link between national culture and entrepreneurial action and aspirations by individuals. This is problematic, since entrepreneurial behaviors are performed by individuals who are embedded in a wider socio-cultural context (McMullen & Shepherd, 2006; Phan, 2004). In order to estimate the effect of culture on entrepreneurial behaviors, analytical techniques are needed that accurately account for individual- and group-level effects of such behaviors (Peterson, Arregle & Xavier, 2012). Thus far, studies have either used country-level predictors to predict country-level rates of entrepreneurship (e.g., Freytag & Thurik, 2007; Stephan & Uhlaner, 2008; Stephan & Uhlaner, 2010; Uhlaner & Thurik, 2007; Wennekers, Thurik, Stel & Noorderhaven, 2007); used individual-level perceptions of culture to predict individual-level behaviors (e.g., Mueller & Thomas, 2001); or simulated individual-level data from country-level prevalence rates of entrepre-

neurial action (e.g., Bowen & De Clercq, 2008; De Clercq, Danis, & Dakhli, 2010). All of these approaches carry theoretical and methodological challenges.

Country-level studies often suffer from the individualistic fallacy (Seligson, 2002:273) in incorrectly imputing individual-level entrepreneurial behaviors to the national level. As Hofstede notes (2001:17, cf. Javidan, House, Dorfman, Hanges & De Luque, 2006), countries: *"…are not king size individuals. They are wholes, and their internal logic cannot be understood in the terms used for the personality dynamics of individuals. Eco-logic differs from individual psycho-logic…"*. Individuals can behave entrepreneurially, but it is far less obvious what the notion of an 'entrepreneurial country' means (Acs, Autio & Szerb, 2012). Using country-level predictors to predict country-level aggregates of individual behaviors masks the effect of individual-level attributes on behaviors. This problem also applies to studies that simulate individual-level data from country-level prevalence rates of entrepreneurship (e.g., Bowen & De Clercq, 2008). Country-level studies restrict cultural effects to operate through societal structures, impeding the consideration of the effect of culture on individual-level motivations and social legitimacy and feasibility considerations. On the other hand, studies using individual-level perceptions of culture frequently suffer from the ecological fallacy – or the assumption that collective-level attributes are directly reflected in the behaviors and values of the individual (Peterson et al.,2012, Robinson, 1950). This approach risks confusing individual-level values, desires, and motivations with national culture. If individuals' values were all that matter for individual behaviors, the notion of culture would become redundant, and there would be no point in theorizing about cultural effects on entrepreneurship.

In summary, culture is fundamentally a collective-level construct. Entrepreneurship is fundamentally an individual- or team-level construct. Country-level studies are limited to theorizing about societal structures, thereby ignoring individual-level motivations and considerations. Individual-level studies are limited to theorizing about the individual, thereby ignoring the broader decision-making context within which individuals are embedded. A multi-level design helps avoid both the ecological and individualistic fallacies by allowing the simultaneous consideration of country-level and individual-level factors on entrepreneurial behaviors.

In our theory development, we leverage the strength of a multi-level design to test a theoretical framework that portrays individuals as proactive and self-reflecting (Bandura, 1986) – i.e., able to anticipate and proactively adjust to the likely consequences of their actions. Consistent with Tiessen (1997), we emphasize the variance-inducing and resource mobilizing aspects of entrepreneurial behaviors. Echoing the action theory of entrepreneurship, our model assumes that entrepreneurial actions are regulated by individuals' evaluation of the first-person feasibility and desirability of this action (Ajzen, 1991, McMullen & Shepherd, 2006). Our model addresses such feasibility and desirability evaluations by considering the effect of culture on two kinds of anticipated consequences of variance-inducing and resource-mobilizing entrepreneurial behaviors for the individual: economic and social. In our theorizing, national culture influences economic risks and opportunity costs of entrepreneurial behaviors through societal economic structures, behaviors, practices, and resource allocation mechanisms. We also theorize that national culture will influence the likely reactions of a given individuals' peers toward entrepreneurial entry, success, and failure. By regulating the economic and social trade-offs associated with alternative courses of action, as observed by the entrepreneur, culture indirectly influences the first-person feasibility and desirability considerations of potential entrepreneurs (McMullen & Shepherd, 2006).

Choice of Cultural Influences

As complex social behavior, entrepreneurship can be influenced by many different dimensions of culture. Focusing on the cultural dimensions as identified by the GLOBE study, we anticipate the societal cultural practices of societal institutional collectivism, performance orientation, and uncertainty avoidance to be particularly salient influences, because they resonate with the individualism, proactiveness, competitive orientation, innovativeness, and risk taking commonly ascribed to entrepreneurial behaviors (Lumpkin & Dess, 1996). Entrepreneurship is fundamentally individual-level behavior: individual (and team-level) agency is central for virtually any entrepreneurial effort (Baumol, 1990). This aspect resonates closely with the 'individualism-collectivism' dimension identified in several models of culture (Hayton et al., 2002). Entrepreneurship is also fundamentally proactive and competitive behavior, as new market entrants inevitably need to overcome competition from

established market players, as they seek to dislodge, substitute, and complement existing products and services and initiate new markets (Kirzner, 1997). These aspects resonate closely with the 'performance orientation' dimension of culture, as entrepreneurs invest time and effort into the pursuit of opportunities and growth (Sagie & Elizur, 1999). Finally, as agents of creative destruction and the introduction of novelty into economic systems, entrepreneurs innovate and take risks (Knight, 2002, Schumpeter, 1934). Typically, resources and effort need to be invested before the outcomes of the entrepreneurial endeavor are known. This innovativeness and risk-taking aspect of entrepreneurial behaviors resonates closely with the 'uncertainty avoidance' dimension of culture (Kreiser, Marino, Dickson, & Weaver, 2010).

There is evidence that central characteristics of entrepreneurial behaviors apply across cultural contexts. This is an important precondition for the study of cultural influences on entrepreneurship. Hansen and colleagues (2009) showed that an EO scale comprising innovativeness, proactiveness, and risk-taking exhibited a high level of configural and measurement invariance and was stable across cultural contexts, suggesting that attributes of entrepreneurial behaviors are perceived in similar ways across cultures (see also Lee & Peterson, 2000). Furthermore, a recent meta-analysis of empirical EO research found the EO construct to exhibit good predictive validity across cultural contexts, and also, that the EO-performance relationship was particularly strong in micro firms (Rauch, Wiklund, Lumpkin, & Frese, 2009). Such cross-cultural stability is important, since if the fundamental content of entrepreneurial behaviors were themselves subject to culturally induced variation, there would be little meaning in the study of cultural influences on entrepreneurial behavior. Furthermore, although the EO construct was originally developed for corporate venturing contexts, well over 80% of the 53 empirical studies reviewed by Rauch et al covered small and entrepreneurial firms, making their conclusions relevant for our discussion here.

Focus on Cultural Practices

Consistent with recent discussions, we define culture as "*both values and actual ways in which members of a culture go about dealing with their collective challenges*" (Javidan et al. 2006: 899). The GLOBE study distinguishes between cultural practices and cultural values. It measures

cultural practices with 'as is' statements and ultural values with 'as should be' statements (House & Javidan, 2004). In this study, we follow the GLOBE terminology – although the two terms are not used uniformly in the literature (Hanges & Dickson, 2004; Hofstede & Peterson, 2000).

We believe that GLOBE's 'cultural practice' measures are more suitable than the 'value' measures for the study of the kind of consequential social action by self-reflecting individuals that entrepreneurship represents (Merton, 1936). As measured by GLOBE, cultural values represent an individual's views of how the society (or organization) *should* behave. In contrast, GLOBE's cultural practice statements represent the individual's perception of how cultural norms actually are enacted in organizational and societal behaviors and institutional policies and prescriptions (Segall, Lonner & Berry 1998). Cultural practices are external and observable to the individual, and although they may be consequential to the individual, the individual cannot influence the cultural practices observed (Guiso et al. 2006). The theory of planned behavior suggests that if the behavior is consequential to the individual, and if these consequences are subject to forces outside the individual's control, individuals do not necessarily act consistently with their expressed (i.e., internally held) preferences (Ajzen, 1991). Instead, the self-reflecting individual adjusts his or her behaviors consistent with the anticipated consequences of those behaviors. We may expect the discrepancy between expressed preferences and actual behaviors to grow more pronounced, the more consequential the behavior becomes to the individual. Entrepreneurial entry and the pursuit of growth are potentially highly consequential decisions that can alter an individual's relationship with the wider community in both economic and social terms (Baker, Gedajlovic & Lubatkin, 2005; Autio & Acs, 2010, Cassar, 2006). Since the social and economic risk associated with entrepreneurship can be great, and since both are regulated by how important alters react to this behavior, observable cultural practices are likely to be more salient predictors than cultural values of entrepreneurial behaviors. Our focus on cultural practices rather than values is also consistent with the established conceptual framework of individual-level studies on entrepreneurial behavior that stem from Bandura's (1986) conception of individuals as proactive, self-reflecting, and self-regulating, exhibiting measured responses to the social context they experience (Davidsson, 1991; Rauch & Frese, 2007; Zhao, Seibert, & Hills, 2005).

Given our focus on cultural practices, a few clarifying remarks are in order. Most GLOBE measures of cultural practices exhibit negative correlations with cultural values, and the causes of this are subject to ongoing debate (Hofstede, 2006; Javidan et al., 2006; Maseland & van Hoorn, 2009; Taras, Rowney & Steel, 2009). Javidan et al's (2006) deprivation hypothesis suggests deprivation in observed practice would prompt individuals to compensate with more pronounced 'as should be' preferences. This is consistent with the observation that the gap between cultural values and practices tends to be greater in countries where practice scores are relatively low. However, as Maseland and van Hoorn (2009) point out, this pattern does not apply to all cultural attributes – the salient exception being uncertainty avoidance. In this paper, we avoid ambiguity by framing our hypotheses closely around the actual operationalizations of the cultural attributes used by GLOBE.

Finally, although we focus on the three societal-level cultural practices discussed above, we acknowledge that other cultural practices may also influence the individual's choice to engage (or not) in entrepreneurial behaviors. Specifically, in-group collectivism, future orientation, power distance, assertiveness, and future orientation may also influence entrepreneurial behaviors, and we have included some of them as controls in our empirical model (see the method section). We leave theorizing around other cultural practices for future research, however.

In the hypotheses that follow, our theoretical logic is based on the observation that entrepreneurship is potentially highly consequential behavior for the individual – both economically and socially – and that entrepreneurs typically need to access and mobilize external resources such as funding and labor to launch their businesses (Stinchcombe, 1965; Stevenson & Jarillo, 1990). Our arguments operate at both individual and societal levels, and the two are linked by the economic and social trade-offs the individual perceives when contemplating entry into entrepreneurship. The important distinction between resource-mobilizing and variance-inducing behaviors, as suggested in entrepreneurship research (Tiessen, 1997), is reflected in our theoretical model: we expect variance-inducing behaviors (and cultural influences upon them) to be associated more closely (but not exclusively) with entrepreneurial entry, and we expect resource-mobilizing behaviors to be associated more closely (but not exclusively) with entrepreneurial growth aspirations.

Societal Institutional Collectivism Practices and Entrepreneurial Behaviors

The literature distinguishes between several kinds of collectivism that operate at both the individual and the societal levels. These include in-group collectivism, societal institutional collectivism, and relational collectivism (Oyserman, Coon & Kemmelmeier, 2002). This study theorizes how societal-level institutional collectivism practices shape the entrepreneurial behavior of individuals. Hence, we do not investigate, e.g. relational collectivism, which is an individual-centric concept (Brewer & Chen, 2007). Since individuals consider the pursuit of opportunities in relation to their societal environment and need to mobilize external resources (Baker et al., 2005), our main theoretical focus is the effect of societal institutional collectivism practices. In GLOBE, societal institutional collectivism practices refer to the degree to which: (1) leaders in the society encourage group loyalty even if individual goals suffer (reverse coded); (2) the economic system in the society is designed to maximize individual versus collective interests; (3) being accepted by other members of the group is important (reverse coded); and (4) group cohesion is valued more than individualism (reverse coded) (House et al, 2004).

We expect societal institutional collectivism practices to exercise different effects on entrepreneurial entry, on the one hand, and post-entry growth aspirations, on the other. This is because of how societal institutional collectivism practices regulate variance-inducing behaviors and resource-mobilizing behaviors, respectively (Tiessen, 1997). We argue that societal institutional collectivism practices discourage entry into entrepreneurship because such entry signals that the individual places his or her economic interests above those of the group, and the individual is more loyal to self than to the group. Both of these signals would prompt a negative response in a society with a strong societal preference for group cohesion and acceptance by others, and therefore, negatively affect the individual's standing in society. This legitimacy cost would deduct from the desirability of entry into entrepreneurship, as perceived by the individual, thereby inhibiting entry (McMullen & Shepherd, 2006).

Societies where leaders encourage loyalty to the group and where group cohesion is highly valued, would also be less likely to develop structures that encourage the independent (rather than collective) pursuit of economic interests. Such structures would favor large corporate entities over

independent and small firms. In Sweden – a society with strong institutional collectivist practices – Henrekson (2005) showed how the fiscal system favored large corporations, which also enjoyed cheaper and easier access to financing. As illustrated by Henrekson (2005), such bias against individual versus the collective would put entrepreneurs at a disadvantage in resource mobilization. This would inhibit entry into entrepreneurship, because the anticipated weaker feasibility of this option would make prudent individuals choose alternative courses of action. We therefore hypothesize:

> **Hypothesis 1***: Societal-level institutional collectivism will be negatively associated with entry into entrepreneurship at the individual level.*

Although norms of group loyalty and emphasis on collective economic interest inhibit variance-inducing entry into entrepreneurship in collectivist societies, there is no certainty that the same mechanisms apply once an entrepreneurial entry has occurred. Societies with strong institutional collectivist practices are more likely to develop societal structures for risk sharing (Steensma et al., 2000), which might in fact encourage the pursuit of growth by those individuals who have already entered into entrepreneurship. Entrepreneurial entry does not in itself automatically represent large economic risks for the individual, as long as the new venture does not pursue risky behaviors such as growing and employing others (Autio & Acs, 2010). Societies with strong practices of institutional collectivism tend to evolve structures and mechanisms that seek to create benefits for the society (Thelen, 2004). The classic argument of Evesey and Musgrave (1944) emphasized precisely this aspect of collectivist societies, making the case that high tax rates typical of institutional-collectivist societies represent a form of societal risk sharing. The collectivist society will first tax and then redistribute personal and business income for purposes considered beneficial for society (Cullen & Gordon, 2007). This mechanism both increases the availability of, e.g., government grants and subsidies for the pursuit of innovation and growth, and it also makes the access to such resources more open. By making resources available for risk sharing, societal redistributive mechanisms would therefore increase the feasibility of risk-taking for post-entry entrepreneurs. Conversely, highly individualist societies will not necessarily build the kinds of risk-sharing mechanisms that would encourage

entrepreneurs to take risks. If the danger of 'falling flat on your face' is great, entrepreneurs will be more cautious when seeking growth.

Hence, from a legitimacy perspective, the same practices, which may inhibit entry, may actually encourage post-entry growth orientation (Baker et al. 2005). Having entered, most entrepreneurs would thus consider the success of their ventures to also generate benefits for the broader society. In many countries, successful entrepreneurs are explicitly referred to as 'job creators'. In societies that exhibit strong institutional collectivism practices, co-alignment between venture success and the benefit of the broader society would motivate entrepreneurs to work harder to grow their ventures. Summarizing, we hypothesize:

> *Hypothesis **2**: Societal-level institutional collectivism will be positively associated with entrepreneurial growth aspirations at the individual level.*

Uncertainty Avoidance Practices and Entrepreneurial Behaviors

In GLOBE, uncertainty avoidance refers to the extent to which: (1) society stresses orderliness and consistency even at the expense of experimentation and innovation; (2) most people lead highly structured lives with few unexpected events; (3) the society has rules or laws to cover most situations; and (4) societal requirements and instructions are spelled out in detail so citizens know what they are expected to do (House et al., 2004). This is rule-oriented uncertainty avoidance. As such, uncertainty avoidance has received considerably less attention than individualism-collectivism in the entrepreneurship literature (Tiessen, 1997). We theorize that societal uncertainty avoidance practices will be negatively associated with both entrepreneurial entry and growth orientation.

Societal uncertainty avoidance practices increase the potential legitimacy cost of entrepreneurial entry. Entry into entrepreneurship represents a step into the unknown, away from the orderly and consistent employment relationship. Since 'deviant behavior' signals propensity to bend or break rules – a characteristic often associated with entrepreneurial entry (Fairlie, 2002; Zhang & Arvey, 2009) – the legitimacy costs of such deviant tendencies would be more severe in societies where most people live orderly, structured lives and which emphasize having rules and laws to cover most eventualities. When entrepreneurs place themselves outside the established social order, they are exposed to judg-

ment by others, and their performance is contingent upon social acceptance by salient alters (Stinchcombe, 1965). If the individual leaves the orderly and consistent world of regular employment and subsequently fails with the entrepreneurial venture, we may expect the social stigma of such failure to be particularly harsh in rule-based societies, and re-entry to the rule-based employment world consequently more difficult (Landier, 2005). Such considerations would deduct from the perceived desirability of entry into entrepreneurship by individuals. We hypothesize:

> **Hypothesis *3****: Uncertainty avoidance at the societal level will be negatively associated with entrepreneurial entry at the individual level*

Similar mechanisms would also cause uncertainty avoidance to be negatively associated with entrepreneurial growth orientation in post-entry situations. Growth-oriented entrepreneurial behaviors signal that the individual prefers the chaotic and dynamic environment of growth-seeking ventures over steady and stable conditions where most eventualities are regulated ex ante. To pursue and achieve growth, entrepreneurial ventures need to disrupt established patterns of doing business and challenge the established status quo by offering something radically different. This challenge to the 'rules of the game', or established ways of doing business, is more likely to attract a negative response in societies that trade experimentation and innovation for orderliness and consistency, and which emphasize predictability and continuity in corporate relations. Thus, the pursuit of growth would be more likely to seen as 'maverick' behavior in high uncertainty avoidance societies, and failure to deliver the growth would carry a higher social cost for the individual (Begley & Tan, 2001; Johnson & Lenartowicz, 1998). Awareness of this eventuality would deduct from the desirability of making risky bets on the pursuit of growth except in those relatively rare cases where it is possible to pursue and achieve entrepreneurial growth within the established framework of rules and conventions.

Societal uncertainty avoidance practices would also shape societal resource allocation mechanisms (Shane, 1993). If the society stresses orderliness and consistency even at the expense of experimentation and innovation, it would be inclined to favor investment that reinforces true and tried paths over investment that deviates from established, predictable trends and developments (Kwok & Tadesse, 2006). Such a mindset would favor channelling resources into incremental innovation by

established incumbents over disruptive innovation by new, unknown challengers (Ambos & Schlegelmilch, 1998). This would deduct from the perceived feasibility of seeking rapid venture growth. Summarizing, we hypothesize:

> **Hypothesis 4:** *Uncertainty avoidance at the societal level will be negatively associated with entrepreneurial growth aspirations at the individual level*

Performance Orientation Practices and Entrepreneurial Behaviors

GLOBE operationalizes performance orientation as the extent to which: (1) students are encouraged to strive for continuously improved performance; (2) major rewards are based on performance rather than other factors; and (3) innovativeness and performance improvement are rewarded (House et al., 2004). This reflects an emphasis in societal practices on the valuation of training and development; emphasis on results; having a 'can-do' attitude; appreciation of feedback as necessary for improvement; taking initiative; and belief that anyone can succeed if they try hard enough (Javidan, 2004: 245). As these elements are often associated with entrepreneurship (Lumpkin & Dess, 1996; Rauch & Frese, 2007), we predict that societal performance orientation practices will be positively associated with both entrepreneurial entry and post-entry growth aspirations.

Entrepreneurship is typically a more challenging career choice than regular employment. Entrepreneurship represents greater potential variance in terms of professional performance, increasing both upside returns and downside risks. In high-performing societies where individuals are encouraged to improve professional performance, individuals will recognize that entrepreneurship offers more opportunities to excel than does regular employment, and the enterprising individual would be more readily recognized for success than would be the case in regular employment (Baker et al. 2005; Cassar, 2007). Thus, in societies with strong performance orientation practices, individuals would tend to recognize entry into entrepreneurship as a legitimate and desirable course of action. We hypothesize:

> **Hypothesis 5:** *Performance orientation at the societal level will be positively associated with entrepreneurial entry at the individual level*

Essentially the same argument applies to post-entry situations. Although entry into entrepreneurship sends a signal that a given individual is seeking to perform, entry alone does not automatical-

ly translate into performance (Autio, 2007). Once entry has occurred, the entrepreneur needs to mobilize resources in order to realize the upside potential created by entry. Aspiring for venture growth is a demanding goal that signals a 'can-do' attitude – which would be regarded more highly in societies characterized by strong performance orientation practices (Javidan, 2004). This tendency would be boosted by peer pressure in societies that place major rewards on performance improvement (MacMillan, Yang & Tsai, 1992). Individuals in societies with strong performance orientation practices are more likely to monitor the performance of their peers, strengthening their motivation to seek performance (Nanda & Sørensen, 2010). Thus, the societal cultural practice of performance orientation strengthens behavioral norms that consider growth-oriented entrepreneurial behaviors as more legitimate than behaviors that do not aspire for rapid growth. This will motivate entrepreneurs to work harder to grow their firms.

Societal performance orientation practices would also likely shape societal resource allocation mechanisms. If the society places major rewards on performance and rewards innovativeness, this would make it more feasible and rewarding for entrepreneurs to seek to grow their firms (McGrath et al., 1992). Conversely, if performance is not rewarded, investments in new venture growth would still be subject to downside risk, but the prospect of upside rewards would be reduced. Summarizing:

> **Hypothesis 6:** *Performance orientation at the societal level will be positively associated with entrepreneurial growth aspirations at the individual level*

METHODOLOGY

Our theoretical model draws on entrepreneurship theories to highlight individual-level motivations for launching and growing new firms. It also draws on international business research that considers the effect of culture and institutions on economic activity. We analyzed survey data for 42 countries for the years 2005 - 2008 from the Global Entrepreneurship Monitor (GEM) (Reynolds et al., 2005). Since not all countries participated in the GEM survey in all years from 2005 to 2008, we included all countries that had participated at least once during these four years –an approach similar to that adopted by Stephan and Uhlaner (2010). Including all countries also ensured that the number

of country-level observations was adequate in a multi-level study with three country-level predictors and four country-level controls.

We constructed an initial database of 234 376 (population un-weighted) interviews of adult-age individuals, complemented with country-level data on national cultural practices from the Global Leadership and Organizational Behavior Effectiveness (GLOBE) study (House et al., 2004). We supplemented our data with country-level economic and demographic controls from the International Monetary Fund (IMF) and EuroStat.

In order to demonstrate the utility of a multi-level approach in studies of culture and entrepreneurship, we used the same dataset to replicate the Stephan and Uhlaner (2010) study, which also utilized data for years 2005-2008 from the GEM study but for 40 countries only. A total of 38 countries were common to both datasets. In addition, our dataset included France, Japan, Portugal, and Sweden which were missing from the Stephan & Uhlaner (2010) dataset, and their dataset included Iran and Venezuela that were missing from our dataset. We therefore first replicated the Stephan & Uhlaner (2010) country-level analysis to detect whether the slight differences in datasets materially affected findings – they did not. We first report the test of our theoretical model (in Tables 6 and 7), after which we report the replication of the Stephan and Uhlaner (2010) analysis (in Tables 8 – 12).

Insert Table 1 here

We used two dependent variables in testing the hypotheses. The first was individual-level entry into entrepreneurship. GEM identifies three types of entrepreneurs: (1) nascent entrepreneurs (individuals who are active in the process of starting a new firm but have not yet launched it); (2) new entrepreneurs (owner-managers of new firms who have paid wages to any employees for longer than three months but less than 42 months); and (3) established entrepreneurs (owner-managers of firms for 42 months or longer). Since one aspect of our theory considered entry into entrepreneurship, we sampled nascent and new entrepreneurs. This yielded a dataset of 234 376 observations for which complete data (all controls and predictors that featured in the regression models) was available. This dependent variable was a dummy (1=yes), indicating that a given individual qualified as either a nas-

cent or new entrepreneur in the GEM dataset. Our dataset contained 23 065 such individuals (9.8 %). Table 1 shows the number of GEM interviews and entrepreneurs by country.

Consistent with our theoretical focus, our dependent variable measures entry by *individuals*. We are not counting new entrepreneurial ventures. However, there is a major overlap between individuals and new firms in the GEM data: well over 50% of new firms in the GEM dataset are started by an individual entrepreneur. In our dataset, 15 080 out of the 23 065 nascent or new entrepreneurs were (or expected to be) sole owners in their ventures.

Our second dependent variable measures *entrepreneurial growth aspirations* of the identified nascent and new entrepreneurs. For this analysis, we used 23 065 observations (i.e. all individuals who qualified as nascent and new entrepreneurs). We also performed a sub-group analysis using new entrepreneurs only, on the logic that new entrepreneurs would already have received market feedback, and their growth expectations might therefore be more realistic than those of nascent entrepreneurs. Growth aspirations were operationalized by asking each nascent or new entrepreneur to estimate the number of people they expected to employ within 5 years' time. As this variable had a right-skewed distribution, we used the natural logarithm of (growth aspiration + 1) in the analysis while controlling for the number of current employees.

We argue that growth aspirations provide a better test of our theory than eventual realized growth. The decision to pursue growth is a socially visible, and therefore, socially consequential decision that involves significant economic risk and legitimacy trade-offs. Most firms need to invest upfront in order to pursue growth: hire employees; invest in product development; build distribution channels; conduct marketing campaigns; raise funding, and so on. Once commitment to growth has been signaled, such commitments may be difficult to withdraw without cost to the individual's social standing. Thus, although our measure does not reflect realized growth, it nevertheless provides a good reflection of the legitimacy and resource considerations driving allocation of effort into entrepreneurship under uncertainty and when exposed to observable cultural practices (Cliff, 1998), and therefore, a direct and timely reflection of growth-oriented entrepreneurial behaviors (Delmar & Wiklund, 2008). A post-hoc focus on realized growth would not similarly inform on how behavioral choices are

influenced by cultural practices, as not nearly all attempts to pursue growth actually result in growth (Davidsson, 1991). The population-weighted average of this measure was 14 expected jobs.

Country-level (level-2) predictors. Data on country-level cultural practices were obtained from the GLOBE dataset. As independent variables, we used three GLOBE measures of societal cultural practices: *societal institutional collectivism, uncertainty avoidance,* and *performance orientation*. The survey items used by the GLOBE study are listed in the hypothesis section. GLOBE measures cultural norms with 7-point Likert scales, and cultural scores are presented as regression-predicted scores that correct for response bias. In order to provide for easier interpretation of the analysis, we z-standardized the three predictors (as well as the other two GLOBE measures used as controls), such that their effects on either entry or growth aspirations can be interpreted based upon one standard deviation change in each of these predictors. We used response bias -corrected and regression-predicted scores for societal cultural practices scales for all five culture variables. All culture indices from GLOBE were drawn from the data collected by GLOBE consortium (House et al., 2004).

Country-level controls. As controls, we included two GLOBE measures of cultural practices: *in-group collectivism* and *assertiveness*. In addition, to compare the effect of cultural practices and cultural values on entrepreneurial behaviors, we computed parallel models using GLOBE scores for societal cultural values for the same cultural dimensions. In unreported models – available upon request – we also included the remaining four GLOBE measures: *gender egalitarianism*, *humane orientation, power distance* and *future orientation* as controls. The first two were dropped due to multicollinearity, and the latter two were never significant nor affected the regression estimates. For this reason and to avoid over-specifying the country-level part of the model (we only had 42 countries in our dataset), we report models containing only in-group collectivism and assertiveness as controls.

GEM research suggests that a country's level of economic development may influence the nature and distribution of entrepreneurial activity (Stel, Carree & Thurik, 2005). We therefore controlled for the country's *GDP per capita* (purchasing power parity, PPP) during the previous year. As a proxy of the size and change of domestic markets, we controlled for *population size* (in millions) . These controls were taken from IMF and EuroStat datasets.

Individual-level controls. We considered two attitude variables that have been linked to entrepreneurial behaviors: an individual's fear of failure and perceived self-efficacy in entrepreneurial efforts (Arenius & Minniti, 2005). Both were obtained from the GEM dataset. Since GEM is a very expensive social survey, only single-item dichotomous scales are used to measure each of these items. The need for simplicity is further reinforced by GEM's global character: dichotomous (yes/no) scales help minimize bias caused by cultural interpretations. Dichotomous scales also reduce problems with translation equivalence (Ter Hofstede, Wedel & Steenkamp, 2002). Risks of translation bias are further reduced by GEM's back-translation practice and the careful training of national teams, with each new team receiving two days of training in the beginning (Reynolds et al, 2005). All amendments to interview protocols are agreed in annual coordination meetings in which all teams participate, and the administration of the questionnaire is supervised by an 8-member research committee. These safeguards help alleviate concerns regarding translation equivalence. As measurement equivalence can be an issue particularly for attitude variables, we also conducted additional tests of measurement equivalence; these did not highlight problems for these variables (available from authors).

Perceived self-efficacy (1=yes) indicates whether the individual thought that (s) he possessed the knowledge, skills, and experience required to start a new business (Rauch & Frese, 2007). Following earlier studies (e.g. Wagner & Sternberg, 2004), we also controlled for *fear of failure* using a dummy variable (1=yes) that measured an individual's lack of confidence in his or her ability to cope with endogenous or exogenous uncertainty associated with new business ventures, as well as the fear of anticipated consequences of such failure. The questions used by the GEM study to measure each of these two individual-level attitude variables are reported in Appendix 1.

Individuals' entry into entrepreneurship and post-entry growth aspirations may be influenced by demographic characteristics. *Age* is an important influence on entrepreneurial growth aspirations, with younger individuals generally exhibiting higher ambitions. We therefore controlled for the age of the individual, as well as the *squared term of age* to capture any curvilinear effects. Women tend to exhibit lower rates of entrepreneurial entry than men, so we controlled for *gender* (male=1, female=2). Both *education* and *household income* have been associated with entry into entrepreneurship

and post-entry growth aspirations. We controlled for education with a 5-step categorical scale toward higher levels of education (4=graduate experience, 0=none) and household income with a 3-step income tier scale (3=highest income tier). Finally, when estimating growth aspirations, we controlled for the entrepreneurs' *current number of employees* so as to capture idiosyncratic variation in initial conditions of the venture. All these controls were obtained from the GEM dataset.

Estimation Methods

Our data was grouped by country, thus resulting in a hierarchical and clustered dataset. This increased the possibility of 'false positives' in OLS analysis due to under-estimation of standard errors because of their non-normal distribution (Hofmann, Griffin & Gavin, 2000). Since we combined individual-level observations with country-level measures of cultural practices, the data was analyzed using hierarchical linear modeling methods.

To estimate the effects on both our dependent variables we used multi-level random effects specification. Before we describe our estimation methodology, it is necessary to explain what we mean by multi-level random effects. In multi-level (also called mixed linear) methods, fixed effects refer to group-specific factors that are assumed to influence the dependent variable(s). Here, a 'group' is any higher level or level-2 cluster – a country in our case. The use of random effects assumes that the groups are drawn randomly from a larger population (Peterson et al., 2012).

In particular, to estimate the influence of country-level factors (level-2) on an individual's likelihood of entry into entrepreneurship (operationalized as a dichotomous variable), we adopted a random effects logistic regression model, that assumes unobserved country-specific effects (u_i) to be randomly distributed with a mean of zero, constant variance ($u_i \sim IID\ (0, \sigma^2_u)$), and uncorrelated to the predictor covariates. This allowed the constant term (intercept) to vary randomly across countries. To estimate the influence of country-level factors (level-2) on individuals' post-entry growth aspirations, we applied a multi-level linear model (GLS) to estimate fixed parameters and maximum-likelihood estimates of variance components (Raudenbush, 1988).

All of our estimation models adopted a random-effect Generalized Least Square (GLS) algorithm. Random effects analysis allows regression coefficients and intercepts to vary across countries

(Martin, Cullen, & Johnson, 2007). The GLS approach allows the standard errors to vary across groups and provides a weighted level-2 regression so that groups with more reliable level-1 estimates are given greater weights and therefore exercise greater influence in the level-2 regression (Hofmann et al., 2000). Further, ML analysis does not ignore intra-class correlation, thereby reducing the possibility of committing Type-1 and Type-2 errors in estimates.

We adopted a three-step testing strategy to analyze effects on entry into entrepreneurship and post-entry growth aspirations. First, we estimated between-country variance in both dependent variables by including no predictors or controls in our random-effect logistic regression model. We observed significant country-level variance, which necessitated the use of multi-level techniques. This regression model was called the "null model" (Model 1 of Table 6 and Model 1 of Table 7 for entry into entrepreneurship and growth aspirations, respectively). Second, we added individual-level and country-level controls in the model to estimate the proportion of variance explained by these controls alone prior to the addition of the three country-level cultural predictors (Model 2 of Table 6 and Model 2 of Table 7 for entry into entrepreneurship and growth aspirations, respectively). In addition, this step enabled us to isolate the proportions of the remaining variance further explained by the addition of the three predictors alone (after accounting for all control variables) in our third step. Finally, as the third step, we added the three country-level cultural predictors to estimate their influence on entry and growth aspirations (Model 3 of Table 6 and Model 3 of Table 7 for entry into entrepreneurship and growth aspirations, respectively). The decrease in the variance component associated with the error term from those observed in step two provided a measure of the extent to which our country-level predictors exclusively accounted for the proportions of the remaining variance. All analyses were performed using STATA 11. Replications of the analyses using HLM (Raudenbush & Bryk, 2008) and R produced consistent results.

The model used to estimate the effects of culture-level predictors on entry into entrepreneurship and post-entry growth aspirations took the form (Snijders & Bosker, 2004):

$$Dependent\ Variable = \beta_{oj} + (individual\ and\ country\ level\ controls) + r_{ij} \quad (1)$$

$$\beta_{0j} = \gamma_{00} + U_{0j} \quad (2)$$

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{country level predictors}) + U_{0j} \quad (3)$$

Above, γ_{00} = mean of the intercepts across countries (denoted by many as 'constant'), γ_{01} = slopes of country-level (level-2) predictors. The term U_{0j} represents the random part of the equation and is a measure of the country-level residuals and r_{ij} represents individual-level residuals. The level-2 equations (2) and (3) predict the effects (or gammas) of level-2 predictors on level-1 intercept. Models 1 of Tables 6 and 7 (null models) were computed by retaining only β_{oj} in equation (1) and replacing β_{oj} by equation (2). The main effects of country-level cultures, shown in Models 3 of Tables 6 and 7, were estimated by replacing β_{oj} in equation (1) with that in equation (3). In our multi-level framework, the term 'random effects' signals that we allow only the intercept term β_{oj}in equation 1 to vary randomly across countries to account for the variance in the dependent variables, and that β_{oj} are explained by variables measured at the country-level. We do not allow the regression coefficients (slopes) associated with any of the independent variables in equation 1 to vary randomly. In summary, throughout our study, random effects refer to random intercepts (also known as 'intercepts as outcomes') only and not to random slopes (also known as 'slopes as outcomes').

RESULTS

Table 2 provides the descriptive statistics for controls, predictors, and dependent variables. Tables 3 and 4 show the correlation matrices for the individual and the country-level variables. Table 5 reports VIF and tolerance values of variables used in the estimation of entry into entrepreneurship and post-entry growth aspirations, and also, the Cronbach alphas for the three cultural predictors used.

Insert Tables 2, 3, 4 and 5 here

Table 6 shows effects on individual-level entry into entrepreneurship, and Table 7 shows effects on growth aspirations. Studies testing hypotheses at the individual level when individuals are nested within nations should use multi-level models when ICCs show significant national differences in individual-level variables (Hofmann et al., 2000; Peterson et al., 2011). To check this, we first estimated two multi-level logistic regressions as null models without predictors. The intra-class correlation coefficient ICC (or rho), the proportion of total variance contributed by the country-level variance component as frequently used in cross-cultural research (Peterson & Castro, 2006) estimated how

much of the variance in the dependent variables resided between countries. As can be seen in Models 1 in Tables 6 and 7, the ICC values indicate that 10.7 % of the variance in entry into entrepreneurship resided between countries, and 7.1 % of the variance in growth aspirations. This supports the application of multi-level analysis techniques over OLS.

Insert Table 6 here

Table 6 shows the influence of country-level predictors on the individual-level probability of entry into entrepreneurship (reported as odds ratios). We used z-standardized scores of cultural practices (both predictors and controls), while all remaining controls are non-standardized. Random-effect logistic regression models are reported in Models 2 and 3 along with estimates for the fixed part (estimates of coefficients) and random part (variance estimates) and model fit statistics.

Model 2 of Table 6 includes all individual-level and country-level controls. This step reports the proportion of variance in entry into entrepreneurship accounted for by only the individual-level and country-level controls. We observe that the variance component of random intercept decreased from 0.40 in the null model (Model 1 of Table 6) to 0.19 in Model 2, suggesting that our controls explained up to 52.1 % (((0.40 – 0.19)/0.40)*100) of the country-level variance. The percentage values reported were calculated to six decimals to guard against round-off errors (However, numbers within parentheses are rounded to two decimals). Hence the outcome of the operations in brackets will not exactly match the percentage numbers reported. Model 3 of Table 6 shows the influence of the three country-level cultural practices: *institutional collectivism* (hypothesis H1), *uncertainty avoidance* (hypothesis H3) and *performance orientation* (hypothesis H5) on the probability of entry into entrepreneurship. The odds ratios indicate that an increase of one standard deviation in a country's societal institutional collectivism practices reduced the likelihood of average individual-level entry into entrepreneurship by 18% (1 – 0.82; $p < 0.05$). We refer to 'average' individual-level entry into entrepreneurship because the multi-level models, in effect, algorithmically fit models on the 'average' of the individual-level dependent variable across countries. An increase of one standard deviation in a country's uncertainty avoidance practices decreased the probability of an average individual-level

entry into entrepreneurship by 21% (1 – 0.79; $p < 0.001$). We also see that an increase of one standard deviation in performance orientation practices increased the likelihood of average individual-level entry into entrepreneurship by 39% (odds ratio = 1.39; $p<0.001$). Combined, these findings support the country-level hypotheses H1, H3, and H5.

The variance component of random intercept decreased from 0.19 in Model 2 of Table 6 to 0.12 in Model 3 of Table 6, suggesting that 38.0% (((0.19 – 0.12)/0.19)*100) of the remaining variance (after accounting for the control variables) could be explained by the three cultural predictors. This also means that the three cultural predictors collectively explained 18.2% (((0.19-0.12)/0.40)) *100) of the total country-level variance in individual-level entry into entrepreneurship. A pairwise likelihood ratio (LR) test comparing models 3 and the nested model 2 of Table 6 suggested that the introduction of the three cultural predictors significantly improved the model fit ($p < 0.05$), justifying our choice to look at the effects of each country-level predictor when analyzing entry into entrepreneurship.

In order to discern the effects of cultural practices and cultural values on individuals' entrepreneurial behaviors, we substituted the cultural practice predictors with those of cultural value predictors in Model 4 of Table 6. We can see that none of the cultural value predictors exhibited a statistically significant influence on entry into entrepreneurship. Also, we observe that while cultural value predictors are indicated as non-significant in Model 4, their signs are different from those of cultural practices. For the cultural value control variable of assertiveness, the association is exhibited as positive and significant (1.16, $p < 0.05$), whereas for the assertiveness practice the relationship is indicated as negative and significant (0.80, $p < 0.001$). Overall, this pattern suggests that cultural practices provide more significant, and, in terms of theoretical predictions, more meaningful predictors of individual-level entry into entrepreneurship, as compared to cultural values.

Insert Table 7 here

Table 7 shows the influence of country-level predictors on individuals' entrepreneurial growth aspirations. Multi-level random-effect regression models are reported in Models 2 and 3 along

with estimates for the fixed part (estimates of coefficients) and random part (variance estimates) and model fit statistics. Model 2 of Table 7 includes all individual-level and country-level controls. This step reports the proportion of variance (in growth aspirations) accounted for by only the individual-level and country-level controls. We observe that the variance component of random intercept decreased from 0.10 in the null model (Model 1 of Table 7) to 0.08 in Model 2, suggesting that our controls explained up to 23.0 % (((0.10 – 0.08)/0.10)*100) of the country-level variance. A pairwise likelihood ratio (LR) test comparing models 3 and the nested model 2 of Table 7 suggested that similar to the analysis of entrepreneurial entry, adding the three cultural predictors significantly improved the model fit ($p < 0.05$), justifying our choice to look at the effects of each country-level predictor when analyzing post-entry growth aspirations.

Model 3 of Table 7 shows the influence of national-level *societal institutional collectivism* (hypothesis H2), *uncertainty avoidance (*hypothesis H4), and *performance orientation* practices (hypothesis H6) on individual-level growth aspirations (reported as exponentials of beta coefficients, since this dependent variable was log transformed). An increase of one standard deviation in a country's societal institutional collectivism practices increased the average individual-level growth aspiration by 14% (exponential (b) = 1.14; $p < 0.05$). Societal uncertainty avoidance practices were negatively associated with average individual-level growth aspirations, but this association was not statistically significant (exponential (b) = 0.98 < 1 showing negative association). Also, while performance orientation practices were positively associated with average individual-level growth aspirations (exponential (b) = 1.03 > 1 showing positive association), they did not exhibit a statistically significant association with entrepreneurial growth orientations, either. Combined, these observations supported the country-level hypothesis H2 but not H4 and H6.

Since nascent entrepreneurs' own estimations of growth aspirations may be overly optimistic, we also performed analyses on growth orientation using new entrepreneurs only, on the logic that new entrepreneurs have already received market feedback, and their growth expectations might therefore be more realistic. This is reported in Model 4 of Table 7. We observe that while institutional collectivism is still positively related to the growth aspirations of new entrepreneurs, the strength of this effect

is weaker (exponential (b) =1.08: $p < 0.05$ as compared to 1.14 in Model 3 of Table 7) than it is on the sample of nascent and new entrepreneurs combined. This could be because new entrepreneurs' growth aspirations may be more realistic than those of nascent entrepreneurs.

The variance component of random intercept decreased from 0.08 in Model 2 of Table 7 to 0.06 in Model 3 of Table 7, suggesting that 14.2% (((0.08 – 0.07)/0.08)*100) of the remaining variance (after accounting for the control variables) could be explained by the three cultural predictors. This also means that the three cultural predictors collectively explained 10.9% (((0.08 - 0.07)/0.10)) *100) of the total country-level variance in individual-level growth aspirations.

In Model 5 of Table 7, we substituted the cultural practices predictors with cultural values predictors. Once again, we observe that none of the cultural values predictors exhibited a statistically significant influence on entrepreneurial growth aspirations by individuals. Thus, the analyses of cultural effects on entry into entrepreneurship and growth aspirations suggest that cultural practices exercise a more salient influence on post-entry growth aspirations than do cultural values.

Robustness Analysis

Given the large number of observations and heterogeneity in an extensive cross-national longitudinal dataset such as ours, a potential concern is that the results could in part be driven by some influential outlying nations or that the econometric evidence is tainted by some unobservable effect that we failed to include. To determine whether influential outliers influenced our results, we looked at the distribution of number of observations per country, shown in Table 1. Spain stood out as an outlier, accounting for 29.3% of the sample size (68 577 observations out of 234 376). Removing Spain did not materially change effects on entrepreneurial entry and growth aspirations. For entrepreneurial entry, the country-level predictors of institutional collectivism practices changed from odds ratio of 0.82 ($p < 0.05$) to that of 0.81 ($p < 0.05$) and that of uncertainty avoidance practices changed from 0.79 ($p < 0.001$) to 0.82 ($p < 0.05$). The odds ratio for performance orientation practices changed from 1.39 ($p < 0.001$) to 1.38 ($p < 0.001$). For growth aspirations, the exponential of the estimated coefficients of institutional collectivism changed from 1.14 ($p <0.05$) to 1.11 ($p < 0.05$).

We also checked for outliers in the control variables, namely fear of failure and self-efficacy. Spain, the UK, and Thailand had a large number of data points for fear of failure (=1) and Spain and the UK also had a large number of data points for self-efficacy (=1). Removing those countries from our dataset marginally impacted the results. For entry into entrepreneurship, the country-level predictors of institutional collectivism changed from odds ratio of 0.82 ($p < 0.05$) to 0.84 ($p < 0.06$) and that of uncertainty avoidance practices changed from 0.79 ($p < 0.001$) to 0.81 ($p < 0.05$). The odds ratio for performance orientation practices changed from 1.39 ($p < 0.001$) to 1.33 ($p < 0.001$). For growth aspirations, the exponential of the estimated coefficients of institutional collectivism changed from 1.14 ($p <0.05$) to 1.13 ($p < 0.06$).

We also investigated the data for potential outliers on our country-level predictors of institutional collectivism, uncertainty avoidance, and performance orientation practices but found none. Finally, we note that growth aspirations are measured for only those individuals that have been identified as nascent or new entrepreneurs. There is thus a possibility that self-selection to entrepreneurship might have biased our findings. We therefore carried out an additional check and controlled for self-selection into entrepreneurship by computing the Inverse Mill's Ratio (IMR) from a model of entrepreneurial entry, using this as control while estimating the influence of the three country-level cultural predictors on growth aspirations. The outcome of our hypothesis tests with and without the inclusion of IMR was unchanged. All robustness tests are available upon request.

Replication of Stephan and Uhlaner's (2010) analysis

Our analysis above exhibited non-trivial influence of societal-level cultural practices on individual-level entry into entrepreneurship and post-entry growth aspirations. Next, we focus on the merits of the multi-level analysis approach itself, by comparing insights achievable through this approach against those achieved with single-level approaches. To this end, we replicated the country-level analysis by Stephan and Uhlaner (2010) using multi-level techniques. Stephan and Uhlaner used GEM data and GLOBE data from 40 countries for years 2005 – 2008 (mean values over the period) and OLS regression to analyze country-level associations between 'Socially Supportive Culture' and 'Performance-Based Culture' and country-level aggregates of new business owners rate, established

business owner rate, independent new business owners rate, and innovative new business owner rate. Such aggregation of individual-level data into country-level rates removes the opportunity to control for individual-level variables that may confound the relationship between culture and entrepreneurship (Peterson et al., 2012). Instead of individual cultural practices, they used second-order factor composites extracted from GLOBE data. Their analysis indicated that Socially Supportive Culture was positively associated with the prevalence rates of different entrepreneurial behaviors. Performance-Based Culture was negatively associated, but with fewer and weaker effects. They also reported a mediating relationship between Socially Supportive Culture; social desirability of entrepreneurship and entrepreneurial self-efficacy; and entrepreneurship rates.

Because we did not have data for two of the countries in their sample, we first reproduced the cultural practice factors (i.e., Socially Supportive Culture and Performance-Based Culture) using our dataset. The Socially Supportive Culture factor included humane orientation practices as a negative loading and assertiveness practices as a positive loading. The Performance-Based Culture factor included future orientation, uncertainty avoidance, and performance orientation practices as positive loadings and power distance and in-group collectivism practices as negative loadings. This operation yielded factor loadings that were very close to those reported by Stephan and Uhlaner (2010: 1350) – see Table 8.

Insert Tables 8 and 9 here

We then replicated Stephan & Uhlaner's (2010) analysis using our own dataset that included 234 376 individual-level observations from 42 countries for years 2005 - 2008. The replication of the main analysis by Stephan and Uhlaner (2010: 1356) is shown in Table 9. Their results are shown in parentheses and represent standardized beta coefficients from OLS regression analysis (N=40). Our results reported in Table 9 summarize a multi-level random intercept logistic regression on 234 376 observations spread across 42 countries and are shown as odds ratios. In our multi-level analysis, the dependent variables are at the individual level, and the three predictors (Socially Supportive Culture, Performance-Based Culture and National wealth given by GDP per capita) are at the country level.

As can be seen in Table 9, our multi-level analysis replicates the direct effects reported by Stephan and Uhlaner quite accurately when using their predictors and control (they only controlled for national GDP per capita). Our estimates are odds ratios where values above 1 indicate a positive association, and values below 1 indicate a negative association. Stephan and Uhlaner's estimates are standardized beta coefficients, the sign (+/-) of which indicates the directionality of the association. For all direct cross-level effects of Socially Supportive Culture on entrepreneurial entry, we see statistically significant, positive associations, similar to the pattern reported by Stephan and Uhlaner. For Performance-Based Culture, we observe a pattern of negative associations, of which only some are flagged as statistically significant. This, again, is consistent with the findings by Stephan and Uhlaner.

We then replicated the analysis of mediating effects. This test is shown in Table 10. Stephan and Uhlaner (2010) reported mediation effects for Socially Supportive Culture; social desirability and self-efficacy; and entry into entrepreneurship. They operationalized social desirability as a composite of three individual-level variables. This was possible in country-level data, as they used country-level averages for years 2005 – 2008. In individual-level data, different individual-level variables were measured in different years, and only entrepreneurial self-efficacy was measured for all years. Therefore, we performed a mediation test for entrepreneurial self-efficacy first, and second, for the individual's belief that entrepreneurship is considered a good career choice (this being one of the components Stephan and Uhlaner used to create their measure of social desirability). In this design, neither Socially Supportive Culture nor Performance-Based Culture were flagged as significant predictors of either entrepreneurial self-efficacy or social desirability. When these were included as predictors in a regression on entry into entrepreneurship (i.e., new, established, independent new, and innovative entrepreneurship), neither these mediating variables nor SSC or Performance-Based Culture exhibited significant influences on entry into entrepreneurship. Thus, our multi-level replication failed to reproduce the mediation effects shown in the Stephan and Uhlaner analysis. (Note that Table 10 shows mediation test for TEA only. Mediation tests for the other dependent variables used by Stephan and Uhlaner are available from the authors).

To further explore the relative merits of a multi-level approach over a single-level approach, we explored variance explained at different levels. The intra-class correlation, (ICC: not shown in Table 9) associated with the four individual-level dependent variables attributable to country-level factors was 13.1%, 11.2%, 15.6% and 16.0 %, respectively. In our multi-level replication, Socially Supportive Culture and Performance-Based Culture collectively explain 24.5% ((0.49-0.37)/0.49), 15% ((0.41-0.35)/0.40), 23% ((0.61-0.47)/0.61) and 13% ((0.62-0.54)/0.62) of the variance that existed across countries for new entrepreneurs, established entrepreneurs, independent new businesses, and innovative entrepreneurs, respectively. This is a valuable insight that is not possible to obtain with a single-level OLS regression.

Insert Table 10 here

Finally, we used Stephan and Uhlaner's factor composites to predict effects on entrepreneurs' growth aspirations (not studied by Stephan and Uhlaner). This is shown in Table 11. We observe that SSC and PBC are not significant predictors of entrepreneurs' individual-level growth aspirations (Models 1 and 2 of Table 11). Also, Socially Supportive Culture and Performance-Based Culture are not shown as statistically significant influences when entered with controls (Model 3 of Table 11). However, when the cultural dimensions were added individually in a multi-level analysis, societal-level institutional collectivism emerges as a significant influence on growth aspirations (Model 4 of Table 11).

Insert Table 11 here

Summarizing, this replication analysis has been conducted from the perspective of comparing how multi-level analyses may unearth patterns that are hidden in single-level analyses. Although direct cross-level effects replicated Stephan and Uhlaner's results, our analysis failed to replicate mediating effects when individual-level data was used. As such, the failure to reproduce mediating effects is not surprising. The mediating variables are essentially individual-level variables, and including them as mediators in a country-level analysis risks individualistic fallacy. Furthermore, we saw that

the ability of a multi-level approach to explain variance at different levels of analysis can provide insight that single-level approaches cannot. Our comparison suggests that a multi-level approach differs from a single-level (OLS) approach in how it accommodates and explains the mechanisms through which cultural context influences entrepreneurship at the individual level. It allows a more detailed analysis of institutionally embedded institutional action, and it permits a theoretical consideration of causal mechanisms that is more truthful to the levels of analysis at which those mechanisms play out (Smith, Peterson, Thomason & the Event Meaning Management Research Group, 2011). Clearly, the advantages of multi-level techniques are not merely cosmetic when studying phenomena that involve causal processes at multiple levels.

DISCUSSION

Culture is widely thought to regulate both the quality and aggregate rates of entrepreneurial activity across countries. In this paper, we tested a theoretical model that explicated the influence of selected societal cultural practices on both entrepreneurial entry by individuals and on their post-entry growth aspirations. In our theory, individuals were assumed to be self-reflecting and mostly rational, and therefore able to anticipate and evaluate the likely consequences of their actions. Because of this foresight, individuals are able to proactively adjust social behaviors such as entry into entrepreneurship or post-entry pursuit of growth, according to perceived social and economic opportunity costs. At the societal level, the economic opportunity costs were portrayed as being regulated by societal structures and mechanisms for resource mobilization and risk sharing – which themselves are shaped by cultural practices. The social consequences were portrayed as being regulated by culturally-shaped social and behavioral norms, which condition likely reactions to entrepreneurial behaviors. Combined, these mechanisms regulate the feasibility and desirability of entrepreneurial behaviors, as perceived by individuals.

Our study was motivated by the absence of multi-level studies on the culture-entrepreneurship link. We argued that single-level studies of this link were susceptible to either ecological or individualistic fallacies, because they mixed a fundamentally collective phenomenon (i.e., culture) with a fundamentally individual-level behavior (i.e., entrepreneurship). The use of higher-level aggregates

of entrepreneurial action may mask or potentially even distort individual-level decision processes and risks invoking the individualistic fallacy (Kozlowski & Klein, 2000; Seligson, 2002). On the other hand, measuring culture as the individual perceives it may mask the effect of cultural practices on individuals' entrepreneurial behaviors, thus invoking the ecological fallacy (Seligson, 2002). We have presented what we think one of the first multi-level test of the link between societal cultural practices and individual-level entrepreneurial behaviors, thereby contributing towards a theoretically and methodologically more appropriate approach to the study of this important relationship.

Our analysis reveals that the cultural practices of societal institutional collectivism were negatively associated with individual-level entrepreneurial *entry* but positively associated with entrepreneurial growth aspirations *post entry*. This finding contrasts with much of the previous research that has tended to emphasize the negative effect of 'collectivism' on entrepreneurial entry. We also find that the cultural practices of uncertainty avoidance are negatively associated with entrepreneurial entry (but not with growth aspirations), while the cultural practices of performance orientation are associated positively with entrepreneurial entry (but not with growth aspirations).

Overall, we believe that our analysis demonstrates the value of a multi-level approach in the study of the important link between national culture and entrepreneurship. We consider the most important benefit of our multi-level approach to be its ability to explain variance in individual-level entrepreneurial behaviors across countries. Our analysis has shown that a non-trivial component of country-level variance in entrepreneurial behaviors can be explained by societal cultural practices. Our analysis not only indicates that the effect of societal cultural practices on entrepreneurial entry is statistically significant, but also, that these practices explain a non-trivial portion of the variance that is attributable to country-level factors. Notably, the increase of one standard deviation in a country's societal institutional collectivism practices reduced the likelihood of individual-level entry into entrepreneurship by 18%; one standard deviation increase in uncertainty avoidance practices decreased the likelihood of entry into entrepreneurship by 21%; and one standard deviation increase in performance orientation practices increased the likelihood of entry into entrepreneurship by 39%. These are non-trivial effects. Overall, our culture predictors exclusively explained 37% of the country-level variance

in entry into entrepreneurship and 25% in growth aspirations – a non-trivial effect that strongly suggests that country-level differences in entrepreneurship cannot be satisfactorily explained without taking national cultural practices into account.

Our analysis also demonstrated the value in extending the study of entrepreneurial behaviors beyond entry. We argued that the most consequential decisions are made post-entry, and our analysis revealed differing, counter-intuitive effects of societal institutional collectivism practices on entrepreneurial entry behaviors and post-entry growth aspirations. This observation has important implications for policy, because in entrepreneurship, quality matters more than quantity: findings show that only a small minority – perhaps 5-10% – of new firm entries generate up to 70-80% of the aggregate economic impact produced by all new firms (Autio, 2007). Previous research would imply that societies should seek to discourage collectivist institutional practices if they wish to encourage entrepreneurship. Yet, our analysis on post-entry considerations suggests that such an approach could actually discourage the most consequential entrepreneurial behaviors – i.e., growth orientation. We used growth aspirations as a proxy for post-entry entrepreneurial behaviors while taking care not to equate it with realized growth. Studies focusing on entry alone may give rise to erroneous policy implications, if effects on entry behaviors differ from effects on growth behaviors.

Although our findings regarding the effect of uncertainty avoidance and performance orientation practices on entrepreneurial entry may seem intuitive, this is not necessarily the case. Wennekers et al. (2007), for example, found uncertainty avoidance to be positively associated with entry into entrepreneurship in a country-level study. Further, the relationship between uncertainty avoidance practices and entrepreneurial behaviors is not straightforward. In their recent treatment of the topic, Venaik and Brewer (2010) suggested that rule-based uncertainty avoidance should encourage entrepreneurship because formal rules promote predictability in economic transactions. In contrast, we predicted and saw the opposite, emphasizing mechanisms that operate through informal rules. We theorized that entrepreneurs cannot easily grow their firms without challenging the established status quo in the market. This status quo is created by incumbents who seek to benefit by establishing tacit or explicit agreements regarding pricing and production volumes (Podolny, 2005: 177). Our theoriz-

ing emphasized the tendency of uncertainty-avoiding societies to promote tacit collusion among established players and the entry- and growth-inhibiting effect thereof, rather than the uncertainty-reducing effect of formal rules on economic transactions.

In our models, we also compared the effect of societal cultural practices and societal cultural values on entrepreneurship, as operationalized by the GLOBE study. Consistent with the action theory of entrepreneurship, which portrays individuals as performing evaluations of observed third-person opportunities (McMullen & Shephard, 2006), we found objectively observable cultural practices to exercise a more salient influence on entrepreneurial behaviors than did cultural values. The effects of cultural values were not statistically significant, and their signs differed systematically from the signs exhibited by cultural practices. This finding, we believe, carries important implications for the choice of appropriate measures of culture in future studies of entrepreneurship.

As this paper has been written for a special issue on multi-level methods, we took the unusual step of replicating a previous single-level analysis using practically the same data. Although our multi-level analysis reproduced previously reported direct effects quite faithfully (modeled in our analysis as cross-level direct effects), it failed to replicate the mediating effects. We speculate that this may be because the mediating variables in the previous study were country-level aggregates of essentially individual-level variables. This, we believe, demonstrates the risks associated with the aggregation of variables from a lower to a higher level of analysis, as well as the associated theoretical challenges (Peterson & Castro, 2006). Although it makes sense to hypothesize mediating effects at the individual level, doing so using country-level aggregates of individual-level variables obscures the meaning of those variables and risks falling prey to the individualistic fallacy. Even though the population at large may exhibit high aggregate levels of, say, entrepreneurial self-efficacy, country-level aggregates cannot either confirm or exclude the possibility that individuals exhibiting high levels of self-efficacy may not actually be behaving entrepreneurially. For greater theoretical accuracy and empirical precision, multi-level analyses are needed. As we demonstrated, this approach also provides valuable additional insight into variance explained at different levels of analysis.

Our study provides implications for entrepreneurship theory, methods, and policy. By studying the effect of national culture on entrepreneurial behaviors, we have responded to the observation that entrepreneurial behaviors cannot be understood without due attention to the context in which they are enacted (Aldrich, 2009; Terjesen, Hessels & Li, 2013). The decision to pursue entrepreneurial growth involves significant legitimacy trade-offs that may be regulated by cultural practices, prompting careful weighting of social legitimacy costs arising from the interpretation of the symbolic value of alternative behaviors, resource investment, and the preclusion of alternative pursuits. To understand why some individuals and not others choose to pursue entrepreneurial growth, it is therefore important to develop and test multi-level theories that consider not only individual-level characteristics, but also, the context within which those characteristics influence entrepreneurial behaviors (Busenitz, West, Shepherd, Nelson, Chandler & Zacharakis, 2003, Davidsson & Wiklund, 2001, Phan, 2004). Today, such enquiries remain few. Our research serves as a reminder that the vast majority of entrepreneurship research is US- and Europe-centric, often devoid of context, and therefore, only limitedly generalizable beyond the immediate cultural context within which that research was carried out (Aldrich, 2009; Thomas & Mueller, 2000). If we are to develop generally applicable theories of entrepreneurial behaviors, research has to start paying more attention to contextual variables than has been the case thus far.

For policy practice that seeks to manipulate context in order to engender desired outcomes, more attention is needed to consider the varying effects of context on entrepreneurial entry and growth aspirations, the latter being more important for economic development (Autio, 2007). Our research suggests that societies should promote entrepreneurial role models that emphasize entrepreneurship as a cultural norm, rather than as behavior that conflicts with established norms. Societies low on institutional collectivism might benefit by building mechanisms that mitigate the risks associated with resource investments in the pursuit of entrepreneurial growth. Similar initiatives could help mitigate the negative effect of cultural uncertainty avoidance on entrepreneurial behaviors. On the other hand, societies high in institutional collectivist practices might benefit from actively encouraging entrepreneurial role models and programs that present entry into entrepreneurship as a socially

acceptable, legitimate career choice. They might benefit further by highlighting entrepreneurial success stories, making the point that entrepreneurial success benefits the broader society. On the other hand, societies high in uncertainty avoidance practices should be careful to tolerate and nurture also status quo –challenging activities, even if these would risk disrupting established business practices.

Our study also comes with limitations, many of which represent interesting avenues for replicating, challenging, and extending the theoretical model presented. We have only theorized and estimated main effects of cultural predictors, and we have not tested any cross-level moderation effects. So doing, we left open the question whether the same individual would behave differently in different cultural contexts. Would, for example, similarly educated individuals respond differently to given cultural practices in different countries? Future research should consider how the cultural context moderates the effect of individual-level attributes on entrepreneurial behaviors (e.g. Wennberg, Pathak & Autio, 2013). Of the societal-level constructs in our theoretical model, we focused on the cultural norms of institutional collectivism, uncertainty avoidance, and performance orientation. There are many more cultural attributes that also might influence entrepreneurial behaviors. The extension of our theoretical model with additional individual-level and country-level variables could further explain the nuances of individual-level entry into entrepreneurship and post-entry growth aspirations in cross-cultural settings.

In conclusion, this study has demonstrated, using a rigorous application of multi-level analysis techniques, important and partly counterintuitive relationships between national cultural attributes and individual-level entrepreneurial behaviors. Our research represents only an early inquiry into this fascinating area. We hope that our study will inspire further studies of this important topic.

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Table 1 Sample Descriptives

Country	N	%N	Entry=1	Entry=0	%Entry	GA	Age	Gender	Education	HHINC
Argentina	2 262	1.0	404	1 858	18	9	38	1.48	2.46	1.95
Australia	2 065	0.9	290	1 775	14	7	43	1.58	2.71	2.14
Austria	1 692	0.7	149	1 543	9	25	40	1.48	1.75	1.84
Bolivia	1 342	0.6	479	863	36	3	36	1.54	1.93	1.87
Brazil	5 475	2.3	811	4 664	15	4	37	1.50	1.62	1.52
Canada	804	0.3	91	713	11	8	40	1.55	3.05	1.59
China	4 151	1.8	863	3 288	21	36	38	1.44	1.96	1.89
Colombia	4 628	2.0	1 237	3 391	27	14	37	1.52	1.93	1.49
Denmark	10 161	4.3	521	9 640	5	12	43	1.54	3.17	1.82
Ecuador	1 653	0.7	386	1 267	23	6	37	1.58	1.80	1.88
Egypt	1 376	0.6	250	1 126	18	21	35	1.41	2.67	1.85
Finland	3 902	1.7	383	3 519	10	5	41	1.45	2.24	1.91
France	4 181	1.8	159	4 022	4	9	40	1.52	2.58	1.98
Germany	6 396	2.7	620	5 776	10	12	43	1.54	2.14	1.94
Greece	4 093	1.7	460	3 633	11	4	40	1.47	2.40	2.00
Hong Kong	983	0.4	138	845	14	37	38	1.53	2.33	2.22
Hungary	4 265	1.8	272	3 993	6	4	40	1.49	1.95	2.05
India	2 644	1.1	411	2 233	16	4	35	1.26	2.28	1.67
Indonesia	1 555	0.7	366	1 189	24	3	37	1.59	1.24	1.97
Ireland	3 090	1.3	357	2 733	12	13	42	1.56	2.67	1.96
Israel	1 971	0.8	188	1 783	10	47	37	1.46	2.78	1.89
Italy	2 209	0.9	139	2 070	6	6	44	1.48	2.28	1.83
Japan	3 421	1.5	227	3 194	7	29	43	1.51	2.86	1.81
Kazakhstan	1 171	0.5	152	1 019	13	12	38	1.54	2.76	1.53
Malaysia	1 056	0.5	187	869	18	2	37	1.43	1.49	1.96
Mexico	4 659	2.0	430	4 229	9	4	35	1.50	1.98	1.89
Netherlands	5 226	2.2	462	4 764	9	11	44	1.52	2.37	2.09
New Zealand	530	0.2	122	408	23	9	43	1.57	2.64	1.87
Philippines	1 546	0.7	387	1 159	25	3	38	1.50	1.99	2.08
Portugal	681	0.3	106	575	16	12	39	1.44	2.15	2.06
Russia	1 871	0.8	55	1 816	3	29	40	1.63	2.76	2.10
Singapore	3 471	1.5	312	3 159	9	13	38	1.47	2.47	2.15
Slovenia	5 286	2.3	397	4 889	8	13	41	1.50	2.24	1.99
South Africa	4 706	2.0	466	4 240	10	9	36	1.50	1.64	2.24
South Korea	1 124	0.5	168	956	15	40	41	1.45	2.92	2.08
Spain	68 557	29.3	5 401	63 156	8	5	42	1.48	2.26	1.92
Sweden	3 772	1.6	151	3 621	4	8	45	1.50	2.61	2.11
Switzerland	4 485	1.9	340	4 145	8	9	42	1.49	2.02	1.87
Thailand	5 413	2.3	966	4 447	18	4	40	1.60	1.97	1.98
Turkey	4 003	1.7	324	3 679	8	36	37	1.45	2.16	1.83
USA	4 680	2.0	752	3 928	16	24	45	1.49	3.03	2.02
UK	37 820	16.1	2 686	35 134	7	11	45	1.62	2.49	1.38

Notes: Expected jobs in 5 years is excluding the focal entrepreneurs
N is the number of observations, N and N% computed using population weights
%Entry represents the % of respondents per country that are identified as nascent or new entrepreneurs
Entry and expected number of jobs in 5 years (Growth Aspirations denoted in Table 1 by GA) are the two dependent variables
Age represents the average age of respondents per country for year 2005-2008
Gender is coded Male=1 and Female=2
Education is the average education level of respondents per country for year 2005-2008. None=0, some secondary=1, secondary=2, post-secondary=3, and graduate experience=4
HHINC represents average household income tier of respondents per country for year 2005-2008. 1=lower middle, 2=middle, and 3=upper middle

Table 2 Descriptive statistics

Level-1 Variables	N	Mean	Std. Dev	Min.	Max.
Entry into entrepreneurship	234 376	0.10	0.30	0	1
Growth aspirations	23 065	10.84	85.93	0	5000
Age	234 376	41.46	12.64	18	64
Gender	234 376	1.52	0.50	1	2
Education	234 376	2.32	1.14	1	4
Household income	234 376	1.83	0.80	1	3
Self-efficacy	234 376	0.50	0.50	0	1
Fear of failure	234 376	0.38	0.49	0	1
Current jobs	23 065	5.29	97.35	0	6000

Notes: N, Mean and SD columns present population-weighted values
Notes: Min and Max columns present population un-weighted values
Notes: Growth aspirations is the expected number of jobs in 5 years
Notes: Entry and Growth aspirations are the two dependent variables in our analysis

Level-2 Variables	N	Mean	Std. Dev	Min.	Max.
GDP per capita (PPP), KUSD	42	27 200.97	10 787.10	2 405.68	46 863.37
Population, millions	42	88.73	208.87	2.00	1 321.05
In-group collectivism	42	4.96	0.74	3.46	6.14
Assertiveness	42	4.24	0.27	3.41	4.71
Institutional collectivism	42	4.17	0.39	3.41	5.26
Uncertainty avoidance	42	4.28	0.57	3.09	5.42
Performance orientation	42	4.10	0.30	3.34	5.04

Notes: All columns present population un-weighted values

Table 3 Correlation matrix of entry and growth aspirations with individual-level variables

Level-1 Variables	1	2	3	4	5	6	7	8
(1) Age	1.00							
(2) Gender	0.04*	1.00						
(3) Education	-0.10*	-0.02*	1.00					
(4) Household income	-0.06*	-0.10*	0.23*	1.00				
(5) Self-efficacy	-0.04*	-0.16*	0.09*	0.12*	1.00			
(6) Fear of failure	-0.03*	0.05*	-0.03*	-0.03*	-0.13*	1.00		
(7) Current jobs	0.00	-0.00	0.01	0.02*	-0.01	-0.01	1.00	
(8) Growth aspirations [a]	-0.01	-0.03*	0.03*	0.04*	0.01	-0.02*	0.26*	1.00
(9) Entry into entrepreneurship [b]	-0.08*	-0.07*	0.03*	0.06*	0.24*	-0.08*	-	-

[a] Growth aspirations based on 23 065 observations (sample size on which growth aspiration hypotheses were tested: Correlation matrix based on NON-Log transformed growth aspirations)
[b] Entry to entrepreneurship based on 234 376 observations (sample size on which entry into entrepreneurship hypotheses were tested)
Notes: Observations for current jobs and growth aspirations are observed only for entry (=1). Identical values of entry (=1) for all observations of current jobs and growth aspirations therefore did not return any feasible correlation coefficients.
* Represents statistical significances at $p < 0.05$

Table 4 Correlation matrix of entry and growth aspirations with country-level variables

Level-2 Variables	1	2	3	4	5	6	7	8
(1) GDP per capita (PPP), KUSD	1.00							
(2) Population, millions	-0.39*	1.00						
(3) In-group collectivism	-0.46*	0.20*	1.00					
(4) Assertiveness	0.29*	-0.29*	0.02*	1.00				
(5) Institutional collectivism	0.25*	0.12*	-0.49*	-0.47*	1.00			
(6) Performance orientation	0.37*	0.11*	-0.42*	0.11*	0.47*	1.00		
(7) Uncertainty avoidance	0.50*	0.03*	-0.68*	0.09*	0.60*	0.61*	1.00	
(8) Growth aspirations [a]	0.00	0.05*	-0.00	-0.00	0.05*	0.03*	0.02*	1.00
(9) Entry into entrepreneurship [b]	-0.10*	0.06*	0.06*	-0.05*	-0.02*	-0.00*	-0.05*	-

[a] Growth aspirations based on 23 065 observations (sample size on which growth aspiration hypotheses were tested: Correlation matrix based on NON-Log transformed growth aspirations)
[b] Entry to entrepreneurship based on 234 376 observations (sample size on which entry into entrepreneurship hypotheses were tested)
Notes: Observations for growth aspirations are observed only for entry (=1). Identical values of entry (=1) for all observations of growth aspirations therefore did not return any feasible correlation coefficients.
* Represents statistical significances at $p < 0.05$

Table 5 Multicollinearity test on variables

	Entry into entrepreneurship		Growth aspirations		
	VIF[a]	Tolerance[b]	VIF	Tolerance	Reliability (α)[c]
Growth aspirations			1.08	0.92	
Current jobs			1.08	0.93	
Entry into entrepreneurship	1.08	0.92			
Age	1.09	0.92	1.05	0.95	
Age (squared)	1.06	0.94	1.02	0.97	
Gender	1.04	0.95	1.03	0.97	
Education	1.17	0.85	1.05	0.87	
Household income	1.12	0.89	1.09	0.91	
Self-efficacy	1.14	0.87	1.05	0.95	
Fear of failure	1.04	0.95	1.04	0.95	
GDP per capita (PPP), KUSD	2.17	0.50	2.60	0.38	
Population, millions	1.44	0.69	1.59	0.62	
In-group collectivism	3.57	0.28	2.93	0.34	
Assertiveness	2.53	0.39	2.32	0.43	
Institutional collectivism	3.53	0.28	3.03	0.33	0.82
Uncertainty avoidance	4.59	0.21	3.79	0.26	0.67
Performance orientation	2.58	0.38	2.52	0.39	0.78

(N = 234 376 for entry into entrepreneurship: N = 23 065 for growth aspirations)
[a] VIF values greater than 5 signal high collinearity and values greater than 10 indicate reasons for concern due to collinearity amongst variables. Our variables do not suffer from collinearity
[b] Tolerance values less than 0.10 indicate collinearity amongst variables. Our variables do not suffer from collinearity
[c] Reliability of the three cultural practices are reported as Cronbach's alpha. The overall scale reliability coefficient while using the three cultural practices is 0.82. Values >= 0.7 are considered acceptable. Score of alpha for uncertainty avoidance (0.67) practices is marginally short of the acceptable value.

Table 6 Effects on individual-level entry into entrepreneurship (Odds Ratio)

		PRACTICES		VALUES
	1	2	3	4
Fixed part estimates				
Individual-level (Level-1)				
Controls				
Age		0.98***(0.00)	0.98***(0.00)	0.98***(0.00)
Age (squared)		0.99***(0.00)	0.99***(0.00)	0.99***(0.00)
Gender		0.79***(0.01)	0.79***(0.01)	0.79***(0.01)
Education		1.05***(0.00)	1.05***(0.00)	1.05***(0.00)
Household income		1.09***(0.01)	1.09***(0.01)	1.09***(0.01)
Self-efficacy		6.07***(0.12)	6.07***(0.12)	6.04***(0.12)
Fear of failure		0.65***(0.01)	0.65***(0.01)	0.65***(0.01)
Country-level (Level-2)				
GDP per capita (PPP), KUSD		0.99(0.00)	0.99*(0.00)	0.99**(0.00)
Population, millions		1.01(0.00)	1.01(0.00)	0.99(0.00)
In-group collectivism		1.22*(0.10)	1.05(0.10)	1.02(0.06)
Assertiveness		0.92(0.05)	0.80***(0.05)	1.16*(0.07)
Institutional collectivism			**0.82*(0.07)**	**1.11(0.09)**
Uncertainty avoidance			**0.79***(0.08)**	**1.06(0.08**
Performance orientation			**1.39***(0.09)**	**0.98(0.06)**
Random part estimates				
Number of observations	234 376	234 376	234 376	234 376
Number of groups (countries)	42	42	42	42
Variance of random intercept	0.40(0.07)	0.19(0.04)	0.12(0.04)	0.18(0.05)
Variance of overall residual	3.34(0.02)	3.26(0.00)	3.29(0.00)	3.15(0.01)
% of variance, rho	10.7	5.5	3.8	5.4
Model fit statistics				
Degrees of freedom	0	11	14	14
Prob > Chi-squared	-	***	***	***
Log likelihood	-72534	-64665	-64236	-64666
AIC [a]	145 068	129 352	128 500	129360
Likelihood ratio test of rho = 0[b]	***	***	***	***
LR test of model fit [c]	-	-	*	-

Notes: Standard errors in parentheses
*** p < 0.001, ** p < 0.01, * p < 0.05, + p < 0.10
2-tailed significances
Estimates in Columns 2, 3 and 4 represent Odds Ratio (OR). OR > 1 represents a positive relationship, whereas OR < 1 represents a negative relationship.
[a] AIC is Akaike's Information Criterion and is = (2*k – 2*(Log Likelihood)), where k denotes the degrees of freedom (number of predictors in the model). Gradually smaller values over models denote improved model fit.
[b] Statistically significant (p < 0.001) Likelihood ratio test of rho = 0 confirms that country-level variance component is important
[c] LR test performed between Models 2 and 3 using Maximum Likelihood Estimates (MLE)

Table 7 Effects on individual-level entrepreneurial growth aspirations (Exponential of beta coefficients)

	PRACTICES [exponential (beta)]				VALUES [exponential (beta)]
	1	**2**	**3**	**4**	**5**
Fixed part estimates					
Individual-level (Level-1)					
Controls					
Age		0.99***(0.00)	0.99***(0.00)	0.99***(0.00)	0.99***(0.00)
Age (squared)		1.01(0.00)	1.01(0.00)	1.01(0.00)	1.01(0.00)
Gender		0.78***(0.01)	0.78***(0.01)	0.78***(0.02)	0.78***(0.01)
Education		1.07***(0.00)	1.07***(0.00)	1.08***((0.01)	1.07***(0.01)
Household income		1.18***(0.01)	1.18***(0.01)	1.21***(0.01)	1.18***(0.01)
Self-efficacy		1.19***(0.02)	1.19***(0.02)	1.23***(0.03)	1.19***(0.02)
Fear of failure		0.93***(0.01)	0.93***(0.01)	0.93***(0.02)	0.93***(0.01)
Current jobs		1.01***(0.00)	1.01***(0.00)	1.01***(0.00)	1.01***(0.00)
Country-level (Level-2)					
GDP per capita (PPP), KUSD		1.01(0.00)	1.01(0.00)	1.01*(0.00)	1.01(0.00)
Population, millions		0.99(0.00)	0.99(0.00)	0.99(0.00)	0.99(0.00)
In-group collectivism		1.03(0.06)	1.08(0.06)	1.16*(0.06)	1.02(0.04)
Assertiveness		1.03(0.04)	1.08(0.04)	1.05(0.04)	1.03(0.04)
Institutional collectivism			**1.14*(0.02)**	**1.08*(0.02)**	**0.99(0.05)**
Uncertainty avoidance			0.98(0.07)	0.97(0.07)	0.94(0.05)
Performance orientation			**1.03(0.05)**	**1.05(0.05)**	**0.93(0.04)**
Random part estimates					
Number of observations	23 065	23 065	23 065	10 941 [c]	23 065
Number of groups (countries)	42	42	42	42	42
Variance of random intercept	0.10(0.02)	0.08(0.01)	0.07(0.01)	0.06(0.01)	0.07(0.01)
Variance of overall residual	1.31(0.01)	1.25(0.01)	1.25(0.01)	1.24(0.01)	1.25(0.01)
% of variance, rho	7.1	6.0	4.5	4.6	5.3
Model fit statistics					
Degrees of freedom	0	12	15	15	15
Prob > Chi-squared	-	***	***	***	***
Log likelihood	-35978	-35415	-35408	-16762	-35412
AIC [a]	71956	70854	70846	33554	70854
LR test Vs Linear regression	***	***	***	***	***
LR test of model fit [b]	-	-	*	-	-

Notes: Standard errors in parentheses
*** p < 0.001, ** p < 0.01, * p < 0.05, + p < 0.10
2-tailed significances
Estimates in Columns 2, 3, 4 and 5 represent the exponential of the beta coefficients [exponential (beta)]. [(exponential (beta) – 1] * 100 represents a % increase, whereas [1 - (exponential (beta)] * 100 represents a % decrease.
[a] AIC is Akaike's Information Criterion and is = (2*k – 2*(Log Likelihood)), where k denotes the degrees of freedom (number of predictors in the model). Gradually smaller values over models denote improved model fit.
[b] LR test performed between Models 2 and 3 using Maximum Likelihood Estimates (MLE)
[c] Out of 23, 065 combined nascent and new entrepreneurs, 10, 941 were *only* new entrepreneurs

Table 8 Replication of Stephan and Uhlaner's (2010) culture factor analysis

Variables	Performance Based Culture (PBC)		Socially Supportive Culture (SSC)		h^2	
	Our analysis	Stephan and Uhlaner, 2010	Our analysis	Stephan and Uhlaner, 2010	Our analysis	Stephan and Uhlaner, 2010
Future orientation	0.92	0.90			0.88	0.82
Uncertainty avoidance	0.91	0.91			0.84	0.82
Performance orientation	0.79	0.79			0.64	0.63
Power distance	-0.66	-0.70			0.69	0.57
In-group collectivism	-0.83	-0.75			0.71	0.58
Humane orientation			-0.90	-0.91	0.87	0.83
Assertiveness			0.90	0.90	0.82	0.82
Variance explained (%)	50.00	49.67	27.00	25.00		

Table 9 Replication of Stephan and Uhlaner's (2010) Table 3 and comparison with a multi-level approach

Variables	NEW		ESTABLISHED		INDEPENDENT NEW		INNOVATIVE	
Socially Supportive Culture	**1.32** (0.51***)**	**1.30** (0.37*)**	**1.24** (0.45**)**	**1.23** (0.38*)**	**1.30** (0.42**)**	**1.34** (0.47**)**	**1.27* (0.50***)**	**1.34* (0.50**)**
Performance Bases Culture	**0.84* (-0.31*)**	**0.87 (-0.05)**	**0.93 (-0.28*)**	**0.93 (-0.15)**	**0.81* (0.17)**	**0.76* (0.09)**	**0.88 (-0.12)**	**0.79+ (-0.12)**
GDP per capita (PPP)		0.99 **(-0.41*)**		0.99 **(-0.21)**		1.01 **(0.13)**		1.01 **(0.00)**
Random part estimates								
Number of observations	234 376	234 376	234 376	234376	234 376	234 376	234 376	234 376
Number of groups (countries)	42	42	42	42	42	42	42	42
Variance of random intercept	0.37	0.36	0.35	0.34	0.47	0.50	0.54	0.59
Variance of overall residual	3.25	3.31	3.25	3.16	3.20	3.23	3.28	3.24
% of variance, rho	10.2	9.8	9.7	9.7	12.8	13.4	14.1	15.4
Model fit statistics								
Degrees of freedom	2	3	2	3	2	3	2	3
Prob > Chi-squared	***	**	***	+	**	*	*	+
Log likelihood	-42459	-42459	-66427	-66427	-58142	-58142	-18595	-18595
Likelihood ratio test of rho = 0	***	***	***	***	***	***	***	***

Note:Results from Stephan and Uhlaner's study are shown in parentheses and represent beta coefficients – our results are odds ratios, with values >1 indicating a positive association and values <1 indicating a negative association

*** p < 0.001, ** p < 0.01, * p < 0.05, + p < 0.10

2-tailed significances

Table 10 Multi-level replication of Stephan and Uhlaner (2010) mediation effects (effects on TEA only)

Variables	TEA	ENTREPRENEURIAL SELF-EFFICACY		SOCIAL DESIRABILITY		TEA
Socially Supportive Culture	**1.90****	**1.51**	**1.50**	**1.15**	**1.01**	**1.07**
		(0.33*)	**(0.19)**	**(0.52**)**	**(0.43**)**	
Performance Bases Culture	**0.67+**	**0.81**	**0.80**	**0.81**	**1.16**	**1.09**
		(-0.21)	**(0.04)**	**(-0.18)**	**(-0.01)**	
GDP per capita (PPP)			1.01		0.99	0.99+
			(-0.40+)		**(-0.26)**	
Population in millions						1.01
Age						0.98***
Age(squared)						0.99***
Gender						0.92***
Education level						1.05***
Household income						1.07***
Self-efficacy						**3.89*** **
Fear of failure						0.68***
Social desirability						**0.94*** **
Random part estimates						
Number of observations	234 376	234 376	234376	130 737	130 737	130 737
Number of groups (countries)	42	42	42	41	41	41
Variance of random intercept	0.31	0.39	0.39	0.41	0.29	0.34
Variance of overall residual	3.25	3.53	3.28	3.32	3.24	
% of variance, rho	8.7	10.9	10.6	11.0	8.2	9.2
Model fit statistics						
Degrees of freedom	2	2	3	2	3	11
Prob > Chi-squared	**	*	+	*	*	***
Log likelihood	-72 529	-158032	-158021	-80351	-80344	-48 595
Likelihood ratio test of rho = 0	***	***	***	***	***	***

*** p < 0.001, ** p < 0.01, * p < 0.05, + p < 0.10
2-tailed significances
OLS coefficients reported by Stephan and Uhlaner shown in parentheses

Table 11 Effects on entrepreneurial growth aspirations

	1	2	3	4
Fixed part estimates				
Individual-level (Level-1)				
Controls				
Age			0.99	0.99***
Age (squared)			1.01	1.01
Gender			0.78	0.78***
Education			1.07	1.07***
Household income			1.18	1.18***
Self-efficacy			1.20	1.19***
Fear of failure			0.93	0.93***
Country-level (Level-2)				
Current jobs			1.01	1.01***
GDP per capita (PPP), KUSD		1.01	1.01	1.01
Population, millions			0.99	0.99
In-group collectivism				1.08
Assertiveness				1.08
Institutional collectivism				**1.14***
Performance orientation				**1.03**
Uncertainty avoidance				**0.98**
Socially Supportive Culture	**0.92**	**0.92**	**0.93**	
PerformanceBased Culture	**1.04**	**1.03**	**1.04**	
Random part estimates				
Number of observations	23 065	23 065	23 065	23 065
Number of groups (countries)	42	42	42	42
Variance of random intercept	0.09	0.09	0.08	0.06
Variance of overall residual	1.31	1.31	1.25	1.25
% of variance, rho	6.42	6.42	6.0	4.5
Model fit statistics				
Degrees of freedom	2	3	12	15
Prob > Chi-squared	-	-	***	***
Log likelihood	-35976	-35976	-35414	-35411
LR test Vs Linear regression	***	***	***	***

*** p < 0.001, ** p < 0.01, * p < 0.05, + p < 0.10
2-tailed significances, estimates are exponentials of beta coefficients

Appendix 1

Individual-level Self-Efficacy:
You have the knowledge, skill and experience required to start a new business: YES (=1) NO (=0)

Individual-level Fear of Failure:
Fear of failure would prevent you from starting a business: YES (=1) NO (=0)