Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions

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Abstract

This paper uses Ajzen's theory of planned behavior to build an entrepreneurial intention questionnaire (EIQ) and analyzes its psychometric properties. The entrepreneurial intention model is then tested on a 519-individual sample from two rather diverse countries: Spain and Taiwan. EIQ and structural equation techniques have been used trying to overcome previous research limitations. The role of culture in explaining motivational perceptions has been specifically considered. Results indicate EIQ properties are satisfactory and strong support for the model is found. Relevant insights are derived about how cultural values modify the way individuals in each society perceive entrepreneurship.

INTRODUCTION

There is a growing body of literature arguing that intentions play a very relevant role in the decision to start a new firm. The importance of cognitive variables in understanding this personal decision has been highlighted by Baron (2004) and Shaver & Scott (1991), among other researchers. In their view, this cognitive focus provides additional insights into the complex process of entrepreneurship. «Given the impressive success of a cognitive approach in other fields (e.g., psychology, education), there are grounds for predicting that it may also yield positive results when applied to the field of entrepreneurship» (Baron, 2004: 237).

This study follows the cognitive approach through the application of an entrepreneurial intention model. A number of works have been published lately about this issue. However, a lot of research is still needed to better comprehend what the factors affecting entrepreneurial perceptions are. In particular, our knowledge is specially limited in two specific areas. Firstly, cross-cultural studies are needed for the

effect of different cultures and values on the entrepreneurial intention to be better understood. Nevertheless, for different research to be comparable, measurement instruments has to be standardized. Therefore, there is also a need to develop more adequate, reliable and valid instruments to analyze entrepreneurial perceptions and intentions.

The main purpose of this paper is clearly in line with these needs. The present study is divided into two parts. In the first place, the construction and psychometric properties of a newly-developed instrument -the entrepreneurial intention questionnaire, EIQ- will be described. Reliability and validity analyses will be performed to assess the adequacy of this instrument. Secondly, the applicability of the entrepreneurial intention model to different cultural settings will also be tested.

Empirical analyses of entrepreneurial intentions are increasingly common (Autio, Keeley, Klofsten, Parker, & Hay, 2001: ; Chen, Greene, & Crick, 1998: ; Erikson, 1999: ; Fayolle, Gailly, & Lassas-Clerc, 2006: ; Kickul & Zaper, 2000: ; Kolvereid, 1996b: ; Kolvereid & Isaksen, 2006: ; Krueger, 1993: ; Krueger & Brazeal, 1994: ; Krueger, Reilly, & Carsrud, 2000: ; Lee & Wong, 2004: ; Peterman & Kennedy, 2003: ; Reitan, 1998: ; Tkachev & Kolvereid, 1999: ; Veciana, Aponte, & Urbano, 2005: ; Zhao, Hills, & Siebert, 2005). Most of them have developed their own *ad hoc* research instruments (Chandler & Lyon, 2001). Comparisons between these works become quite problematic, since differences among construct measures are sometimes substantial. Therefore, this paper undertakes the task of building a measure that may be statistically robust and theoretically sound.

This instrument will then be used on samples from two quite different countries (Spain and Taiwan). Data thus obtained will be used to test the entrepreneurial intention model using structural equation techniques, following Ajzen's (1991)

formulation of the theory of planned behavior. This implies the existence of structural relationships. In the past, most research on entrepreneurial intentions has used linear regression models (Chandler & Lyon, 2001), despite the risk of biased results.

Regarding the pattern of relationships in the model, one important concern is the traditionally-weak role of subjective norm in the theory of planned behavior (TPB). In the area of entrepreneurship, however, this alleged weakness is not so clear. Nevertheless, some studies have simply omitted subjective norm (Peterman & Kennedy, 2003; Veciana et al., 2005), while others found it to be non-significant (Autio et al., 2001; Krueger et al., 2000). The existence of interactions and indirect effects of subjective norm on intention could be explaining these results. Thus, in this paper, structural equations are used, so that a clearer understanding of those effects may be gained.

This study will hopefully shed some light on a number of issues. It will serve as a confirmation of the applicability of this cognitive model to the entrepreneurial decision. In this case, our sample comes from two countries with very different cultural and social structures. Thus, the robustness of this model in different settings will be tested. It will also contribute to clarifying the specific pattern of relationships among the intention antecedents. Besides, some of the effects of culture over entrepreneurial intentions will be tested. Finally, relevant implications for educators and policy-makers could be derived.

In this sense, these two countries are clearly different in history and culture. Nonetheless, they are both sizeable economies, whether we consider their population (42.7 million in Spain and 22.7 in Taiwan, according to the World Bank 2004 data) or total GDP (US$1039.9 and US$322.2 billion, respectively). They are both considered high income countries (US$21530 and US$15350 per capita). Besides, according to

the GEM report (Reynolds, Bygrave, Autio, & Hay, 2002), similar levels of entrepreneurial activity[1] are found in both of them (around 4.6%). These data suggest Spain and Taiwan, despite their large differences, are not completely dissimilar, which would render the comparison more fruitful.

The organization of the paper is as follows. After this introduction, section two reviews previous contributions and presents the theoretical entrepreneurial intention model adopted, together with the hypotheses to be tested. The third section describes how the questionnaire was developed and its psychometric properties. Section four presents the results for the cross-country study using a structural equations model. Finally, a discussion is included in section five. The paper ends with a brief conclusion.

THEORY AND HYPOTHESES

The decision to become an entrepreneur may be plausibly considered as voluntary and conscious (Krueger et al., 2000). Therefore, it seems reasonable to analyze how that decision is taken. Entrepreneurship may be viewed as a process that occurs over time (Gartner, Shaver, Gatewood, & Katz, 1994: ; Kyrö & Carrier, 2005). In this sense, entrepreneurial intentions would be the first step in the evolving and –sometimes- long process of venture creation (Lee & Wong, 2004). The intention to start up, then, would be a necessary precursor to performing entrepreneurial behaviors (Fayolle, Gailly, & Lassas-Clerc, 2006: ; Kolvereid, 1996b). Intention is considered

[1] Data from the Global Entrepreneurship Monitor. In 2002 the term 'Total Entrepreneurial Activity' was used, which corresponds to 'Early-stage Entrepreneurial Activity' at present. That is, nascent entrepreneurs and owners of young businesses (up to 42 months of existence).

the single best predictor of behavior (Ajzen, 1991: , , 2001: ; Fishbein & Ajzen, 1975).

In turn, the intention of carrying out entrepreneurial behaviors may be affected by several factors, such as needs, values, wants, habits, and beliefs (Bird, 1988: ; Lee & Wong, 2004). In particular, the cognitive variables influencing intention are called motivational 'antecedents' by Ajzen (1991). More favorable antecedents would increase the start-up intention (Liñán, 2004). Obviously, situational factors also influence entrepreneurial intentions (Ajzen, 1987: ; Boyd & Vozikis, 1994: ; Tubbs & Ekeberg, 1991). These external factors influence one's attitudes toward entrepreneurship (Krueger, 1993). Variables such as time constraints, task difficulty, and the influence of other people through social pressure could be examples of these situational factors (Lee & Wong, 2004).

Results have supported the applicability of the theory of planned behavior (TPB) to entrepreneurship, despite some conflicts between the various studies. A good part of these differences may have been due to measurement issues (Chandler & Lyon, 2001). In fact, measuring cognitive variables implies considerable difficulty (Baron, 1998). Thus, empirical tests have differed widely. Krueger et al. (2000) used single-item variables to measure each construct. Kolvereid (1996b) used a belief-based measure of attitudes. More recently, Kolvereid & Isaksen (2006) have used an aggregate measure for attitudes, but a single-item one for intention. Similarly, some of these studies used an unconditional measure of intention (Autio et al., 2001; Kickul & Zaper, 2000; Kolvereid & Isaksen, 2006; Krueger et al., 2000; Zhao et al., 2005), while others forced participants to state their preferences and estimated likelihoods of pursuing a self-employment career 'as opposed to organizational employment' (Erikson, 1999; Fayolle et al., 2006; Kolvereid, 1996b). Therefore, there is work to be

done to produce a standard measurement instrument for entrepreneurial intention and its antecedents. In this sense, this paper develops an entrepreneurial intention questionnaire (EIQ), based on an integration of psychology and entrepreneurship literature, as well as previous empirical research in this field. The EIQ tries to overcome the main shortcomings of previous research instruments.

According to the TPB, entrepreneurial intention indicates the effort that the person will make to carry out that entrepreneurial behavior. And so, it capts the three motivational factors, or antecedents, influencing behavior (Ajzen, 1991: ; Liñán, 2004):

- *Attitude towards start-up (personal attitude, PA)* refers to the degree to which the individual holds a positive or negative personal valuation about being an entrepreneur (Ajzen, 2001; Autio et al., 2001; Kolvereid, 1996b). It includes not only affective (I like it, it is attractive), but also evaluative considerations (it has advantages).
- *Subjective norm (SN)* measures the perceived social pressure to carry out -or not to carry out- entrepreneurial behaviors. In particular, it would refer to the perception that 'reference people' would approve of the decision to become an entrepreneur, or not (Ajzen, 2001).
- *Perceived behavioral control (PBC)* is defined as the perception of the ease or difficulty of becoming an entrepreneur. It is, therefore, a concept quite similar to *self-efficacy (SE)* (Bandura, 1997), and to perceived feasibility (Shapero & Sokol, 1982). All three concepts refer to the sense of capacity regarding the fulfillment of firm-creation behaviors. Nevertheless, recent work has emphasized the difference between PBC and self-efficacy (Ajzen, 2002). PBC would include not only the feeling of being able, but also the perception about controllability of the behavior.

The relative contributions of these three motivational factors to explaining entrepreneurial intention are not established beforehand. The specific configuration of relationships between those constructs would have to be empirically determined for each specific behavior (Ajzen, 1991, 2002).

In the specific area of entrepreneurship research, only seven out of the sixteen studies reported above included subjective norms in the analysis. However, two of them did not perform any regression analysis. Of the remaining five studies, three found SN to significantly explain EI (Kolvereid, 1996; Kolvereid & Isaksen, 2006; Tkachev & Kolvereid, 1999), whereas the other two found SN to be non-significant (Autio et al., 2001; Krueger et al., 2000). Therefore, although there is support for the idea that a direct SN-EI relationship might be established, some controversy remains. In this sense, the possibility of indirect effects of SN on EI should be investigated further.

In this sense, there may be reasons to consider that subjective norm has an effect on both personal attitude and PBC. From a social-capital point of view, a number of authors argue that values transmitted by 'reference people' would cause more favorable perceptions regarding personal attitude and PBC (Cooper, 1993: ; Matthews & Moser, 1995: ; Scherer, Brodzinsky, & Wiebe, 1991). Liñán & Santos (2007) describe subjective norm as a specific form of social capital and suggest a causation effect over the other two intention antecedents. Figure 1 reflects this idea.

On the other hand, as mentioned above, human capital and other demographic factors have an influence on intentions (Boyd & Vozikis, 1994; Lee & Wong, 2004; Tubbs & Ekelberg, 1991). In particular, a greater knowledge of different entrepreneurial aspects will surely contribute to more realistic perceptions about entrepreneurial activity (Ajzen, 2002), thus indirectly influencing intentions.

The relevance of experience and education has been widely highlighted, especially for the increased knowledge it provides (Cooper, 1985: , , 1993). In general, greater knowledge will also directly provide a greater awareness about the existence of that professional career option (Liñán, 2004), as may be inferred by the importance attached to the existence of role models (Carrier, 2005: ; Matthews & Moser, 1995: ; Rondstadt, 1990). This latter element would have an influence on PBC and possibly on personal attitude and subjective norm as well (Scherer et al., 1991). Therefore, it might be expected that the different circumstances modifying the level of entrepreneurial knowledge would have distinct and significant effects on the motivational intention antecedents.

Figure 1 around here

Figure 1, therefore, summarizes the model we will be using as a starting point for our analysis. Apart from the explicit inclusion of demographic and human capital variables, Figure 1 is equivalent to the TPB described by Ajzen (1991), and used by Autio et al. (2001), Erikson (1999), Fayolle et al. (2006), Kolvereid (1996b), Kolvereid & Isaksen (2006), Krueger et al. (2000), Reitan (1998) and Veciana et al. (2005), among others. One particularity, however, is that we have specifically hypothesized what the pattern of relationships among the motivational antecedents of intention is. Subjective norm is assumed to influence both personal attitude and PBC.

Cultural considerations

The application of this model to different cultures has been scarce. Autio et al. (2001) is one of the few examples. Culture has been defined as the underlying system of values peculiar to a specific group or society (Mueller & Thomas, 2001). Thus, culture motivates individuals in a society to engage in behaviors that may not be evident in other societies (George & Zahra, 2002: ; Mueller, Thomas, & Jaeger, 2002). Busenitz, Gómez, & Spencer (2000) see culture as a moderator between economic and institutional conditions, on one side, and entrepreneurship, on the other.

Most research about the influence of culture on entrepreneurship has followed Hofstede's (1980) cultural dimensions (Hayton, George, & Zahra, 2002: ; Mcgrath & MacMillan, 1992: ; Mitchell, Smith, Seawright, & Morse, 2000: ; Mueller & Thomas, 2001: ; Mueller, Thomas, & Jaeger, 2002: ; Shane, Kolvereid, & Westhead, 1991). However, Hofstede et al., (2004) consider two alternative forms in which this influence may be exercised. A positive aggregate effect would take place when culture shapes economic and social institutions, making them more favorable towards entrepreneurial activity. Thus, 'integrated' individuals may find it easier to become entrepreneurs. Where culture is relatively unfavorable towards entrepreneurship, 'dissatisfied' individuals would seek personal realization through self-employment.

Mcgrath, MacMillan, & Scheinberg (1992) argue that entrepreneurs would tend to exhibit certain levels of those dimensions: high power-distance (PDI+), low uncertainty-avoidance (UAV-), high individualism (IND+) and high masculinity (MAS+). In particular, they consider PDI+ as a personal characteristic of entrepreneurs, «regardless of whether the culture is high or low on power-distance» Mcgrath et al. (1992: 119). Busenitz & Lau (1996) transfer these assumptions to the national level, suggesting that cultures high on those values would favor the entrepreneurial activity of its members. Mueller et al. (2002) share this view, except

for the PDI index. They argue that low power distance (PDI-) cultures would favor entrepreneurship.

This view is called by Hofstede et al. (2004) the 'aggregate psychological traits' perspective, and would favor start-up of 'integrated' individuals. However, they argue that 'dissatisfied' individuals would tend to become self-employed when the national culture is relatively unfavorable to entrepreneurship. Thus, opposite relationships might be established (PDI+, UAV+, IND- and MAS- national cultural dimensions would be associated with higher self-employment levels).

As Hayton et al. (2002) and Busenitz et al. (2000) point out, cultural dimensions would moderate the relationship between economic situation and entrepreneurial activity. Thus, the relative presence of integrated and dissatisfied entrepreneurs in any given culture may change substantially depending on its economic situation. In this sense, support found by Hofstede et al. (2004) for the 'dissatisfaction' theory might partly be due to their measure of entrepreneurship. They used self-employment as the dependent variable, which is quite different from entrepreneurial activity (Uhlaner & Thurik, 2007). It would include new and established business owners, but it would not yet include nascent and intentional entrepreneurs. It might be expected that new start-up attempts would correspond more closely to 'integrated' entrepreneurial efforts, while 'dissatisfied' business owners would remain self-employed for a long period (Uhlaner & Thurik, 2007).

Thus, a culture unfavorable to entrepreneurship might lead to a higher proportion of self-employed individuals and, therefore, to smaller average firm-size. However, this would be compatible with lower entrepreneurial activity (start-ups attempted). On the other hand, it may be argued that a supportive culture would lead to higher

entrepreneurial intentions among the population and, therefore, more new ventures being attempted.

Values shared within a culture, according to the TPB approach, would affect the motivational intention antecedents. In this sense, a supportive culture would help in the legitimation of entrepreneurship (Etzioni, 1987). As subjective norm reflects the perceived social pressure to start a firm, the influence of cultural values might be stronger on this motivational antecedent (Ajzen, 2001: ; Kristiansen & Indarti, 2004). Begley & Tan (2001) argue that subjective norm tends to play a stronger role in explaining intention in collectivist cultures, and weaker in individualistic societies.

In this study, two quite different countries are considered. Nevertheless, Hoftede's cultural dimensions are relatively similar in both of them. Thus, power-distance (57 for Spain and 58 for Taiwan) and masculinity (42 and 45, respectively) scores are broadly equivalent (Hofstede, 2003). However, Spain scores substantially higher in individualism (51 vs. 17 for Taiwan), which would imply a culture more supportive of entrepreneurship. On the other hand, Spain also scores higher on uncertainty avoidance (86 vs. 69). It could be considered that, in this dimension, Spanish culture is relatively more opposed to entrepreneurship.

The economic situation has been positive in both countries since the mid-nineties (2002 being the only exception). Economic growth has tended to be somewhat higher in Taiwan, whereas unemployment level has been lower. Spain's unemployment, though still higher, has been decreasing substantially since the mid-nineties. Therefore, the influence of the economic situation might be considered as neutral for the purposes of this study.

No specific research comparing the effects of cultural differences on entrepreneurial intentions for these two countries has been found. However, Mcgrath,

MacMillan, Yang, & Tsai (1992) compared cultural values of entrepreneurs from Taiwan and the USA (and also China). Uslay, Teach, & Schwartz (2002) –although not using Hoftede's dimensions- compared entrepreneurial attitudes of Spanish and US MBA students (and also Turkish).

Based on this literature, some tentative predictions may be formulated. Firstly, Taiwan is much less individualistic than Spain, being among the more collectivistic countries in the world, and this seems to be an enduring characteristic (Mcgrath et al., 1992). Thus, one should expect that subjective norm would exert a much higher effect over PA, PBC and EI than in Spain (Begley & Tan, 2001).

Secondly, Uslay et al. (2002) found that Spanish students agreed significantly more than their US counterparts with the statement 'entrepreneurship offers job satisfaction'. On the other hand, Taiwanese entrepreneurs disagree significantly more with the statement 'starting a company adds to the excitement of your life'. This would be indicating that 'salient beliefs' conforming the motivational intention antecedents are different in each culture (Ajzen, 1991: ; Kolvereid, 1996a). In this sense, entrepreneurial intention could be more closely linked to personal attitude among Spanish respondents, whereas in Taiwan PBC would be a relatively stronger influence.

Regarding the effect of higher uncertainty avoidance in Spain, entrepreneurship would be considered a more uncertain career option and, therefore, socially discouraged (Busenitz & Lau, 1996; Mueller et al., 2002). The effect over motivational antecedents, however, is far from clear. High UAV would lead people to feel «threatened by uncertain or unknown situations» (Hofstede, 1991: 113). Thus, they might feel less able to start a firm, even if they had all the technical and practical knowledge. In this sense, the effect of PBC over EI would be lower.

Hypotheses

The hypotheses to be tested are summarized in Table 1. As may be seen, H1 to H3 correspond to the traditional intention model used elsewhere. H4 and H5 would explain the internal configuration of antecedents. To test these two hypotheses, structural equation systems are required.

Table 1 around here

Finally two hypotheses relating to culture have also been derived. The higher collectivist character (IND-) of Taiwan suggests that subjective norm would exert a stronger effect over the other motivational antecedents and also over EI (H6). On the other hand, specific salient beliefs associated with entrepreneurship would be different in Spain and Taiwan. Similarly, higher UAV in Spain might downplay the role of PBC in the formation of entrepreneurial intentions. These two still tentative arguments, taken together, lead us to formulate hypothesis H7.

INSTRUMENT DEVELOPMENT AND PSYCHOMETRIC PROPERTIES

In this paper, the entrepreneurial intention model is considered as essentially adequate to analyze the intention of becoming an entrepreneur. Therefore, an instrument to measure intentions and the other variables in the model was needed. The entrepreneurial intention questionnaire (EIQ) was developed for that purpose. It is

based on the existing theoretical and empirical literature about the application of the TPB to entrepreneurship. Thus, it has been carefully cross-checked with those instruments used by other researchers, such as Autio et al. (2001), Chen et al. (1998), Kickul & Zaper (2000), Kolvereid (1996b), Kolvereid & Isaksen (2006), Krueger et al. (2000) and Veciana et al. (2005). Throughout the whole construction process, Ajzen's (1991, 2001, 2002) work has been carefully revised to solve any discrepancy that might have arisen between the different instruments. The EIQ is available from the authors upon request. Items used to capture the central elements of the entrepreneurial intention model are included in the appendix.

The EIQ has been divided into ten sections. Sections three to six correspond with the elements in the entrepreneurial intention model (see Figure 1). Within them, all constructs are likert-type scales. In this sense, Nunnally (1978) suggests that multi-item scales are more reliable than single-item ones.

The first (education and experience), second (entrepreneurial knowledge) and ninth (personal data) sections require human capital and demographic information that should not affect intention directly, but could be very useful in identifying their effect on PA, SN and PBC.

Finally, we also asked students to voluntarily provide contact data so that they may be studied again later. This follow-up will hopefully allow for future analysis of the intention-behavior relationship. In this sense, a section centered on entrepreneurial objectives has also been included. Its purpose is to analyze students' concept of 'success' and the importance they attach to business development and growth. Entrepreneurial quality has been defined as the behaviors performed to develop the firm and make it dynamic (Guzman & Santos, 2001: ; Santos & Liñán, 2007).

Measures

Entrepreneurial intention has been measured through a likert-type scale with five items. These are general sentences indicating different aspects of intention. A similar system has already been used by Chen et al. (1998) and Zhao et al. (2005). However, Armitage & Conner (2001) identified three distinct kinds of intention measures: desire (I want to …), self-prediction (How likely it is …) and behavioral intention (I intend to …). This latter type seems to provide slightly better results in the prediction of behavior (Armitage & Conner, 2001: 483). In this sense, Chen et al. (1998) use a mix of self-prediction and pure-intention items, whereas Zhao et al. (2005) use 'interest' measures (how interested are you in …). In our opinion, the similarity between interest and intention may not be so clear. For this reason we have chosen a pure-intention measure.

Personal attitude has also been measured through an aggregate attitude scale. This is an important difference compared to other studies, such as those of Kolvereid (1996b) and Fayolle et al. (2006), where a belief-based measure of personal attitude was used. However, Ajzen (1991, 2001) states that beliefs are the antecedents of attitudes, and suggests using an aggregate measure for attitudes (beliefs would explain attitude, while attitude would explain intention). In this sense, Krueger et al. (2000) use such a design, with beliefs explaining an aggregate measure of attitude, while this latter variable was used to explain intention. Similarly, in Kolvereid & Isaksen's (2006) study, both kinds of measures were included together in a linear regression with entrepreneurial intention as the dependent variable. Aggregate attitude was a significant regressor, while beliefs were not. Correlations between the aggregate and belief-based measures are sometimes disappointing (Ajzen, 1991: 192). For this reason, we have chosen an aggregate measure of personal attitude in the EIQ.

Personal attitude towards entrepreneurship has sometimes been measured unconditionally (Krueger et al., 2000), while in some other instances it has been considered as opposed to salaried work (Kolvereid, 1996b). This opposition is far from clear. It has been argued that «this dichotomization is clearly a simplification. […] It is not clear how to categorize people who combine working for an employer and running their own business. There is evidence to suggest that a large proportion of new business founders start their business as a part-time operation while they continue to work for their employer (Carter, Gartner, & Reynolds, 1996: ; Delmar & Davidsson, 2000)» (Kolvereid & Isaksen, 2006: 870).

In this sense, we have included an additional question in the EIQ to test the extent to which these two concepts may be considered as truly opposed. Thus, following Autio et al. (2001), respondents were asked to rate their preference towards both options as different items. Analyzing the correlation between the answers to these two items could serve to check the validity of this assumption.

Subjective norm, according to Ajzen (1991), should be approached through an aggregate measure of the kind 'what do reference people think?' In practice, however, some researchers simply omit this element from the model (Krueger, 1993; Chen et al., 1998). On the other hand, others have posited answers to this question with their respective 'motives to comply' (Kolvereid, 1996b; Kolvereid & Isaksen, 2006; Tkachev & Kolvereid, 1999). Nevertheless, Armitage & Conner (2001: 485) found that, in general, the 'subjective norm X motives to comply' measure tends to show weaker predictive power towards intention than the 'multiple-item subjective norm' measure. This alleged weakness may not be so clear in the specific area of entrepreneurship research. Nonetheless, we have used one simpler scale in the validation process, including three groups of 'reference people: family, friends and

colleagues. In this manner, we also contribute to keep the EIQ as parsimonious as possible.

In previous research, perceived behavioral control has been measured through specific self-efficacies (Chen et al., 1998; Zhao et al., 2005). More general measures of self-efficacy and perceived controllability of behavior have also been used. In particular, Kolvereid (1996b) used a general 6-item scale with good results, whereas Kolvereid & Isaksen (2006) used an 18-item scale that was then grouped into four specific self-efficacies through factor analysis. This latter study showed no significant correlation between PBC and intention. In Ajzen's (1991) opinion, control beliefs would be the antecedents of an aggregate measure of perceived behavioral control. Thus, specific efficacies and control beliefs could be understood as being the antecedent of general PBC. In this sense, as aggregate measures have been used for personal attitude and subjective norm, we chose to keep this scheme for PBC as well.

Therefore, respondents were asked to rate their level of agreement with several general statements about the feeling of capacity regarding firm creation. In a recent work, Ajzen (2002) considers that perceived behavioral control is a concept somewhat wider than self-efficacy. It would also include a measure of controllability (the extent to which successfully performing the behavior is up to the person). Nevertheless, Kolvereid & Isaksen (2006) used a pure 'self-efficacy' scale, because Armitage & Conner (2001) concluded that self-efficacy is more clearly defined and more strongly correlated with intention and behavior. The EIQ includes a 6-item scale; five of these items measure general self-efficacy, whereas one is a controllability statement (15c, see appendix).

Psychometric properties

To analyze the psychometric properties of the EIQ, a sample of last year university students was used. Samples of students are very common in the entrepreneurship literature (Autio et al., 2001; Fayolle et al., 2006; Kolvereid, 1996b; Krueger et al., 2000; Tkachev & Kolvereid, 1999; Veciana et al., 2005). Besides, recent research has found that university graduates between 25 and 34 years of age show the highest propensity towards starting up a firm (Reynolds et al., 2002). Last year students would be, therefore, very close to entering this segment of the population.

Questionnaires were administered in class, with prior permission from the lecturer. Students were briefed on the purpose of the study by a member of the research team, and then asked to voluntarily fill in the EIQ. Questionnaires were in principle anonymous, but contact data were asked for if they freely wanted to participate in the project follow-up. Fieldwork was carried out in October and November 2004 at University of Seville (Spain).

323 questionnaires were thus collected. Thirteen of them were removed due to a high level of missing data, or to respondents being visiting students from abroad. For the remaining 310, missing data were always less than 2% of responses, and were thus retained. Business students were 66.7% of the sample (the rest being students of economics). 53.5% were female, and the average age was 23.8 years. These figures roughly correspond to the general characteristics of students in these degrees. Thus, it may be considered a representative sample.

Chandler & Lyon (2001: 103) consider reliability («consistency and stability of a score from a measurement scale») and validity («evidence that the measurement is actually measuring the intended construct») as the essential psychometrics to be reported.

The first step was using Cronbach's alpha to test reliability of the proposed scales. The usual threshold level is 0.7 for newly developed measures (Nunnally, 1978). In this case, the values range from 0.773 to 0.943 (see last row in Table 2). Thus, the theoretically-developed scales may be considered as reliable.

The second step was validity analysis. Chandler & Lyon (2001) establish several possible validation procedures. Structural and content validities have been carefully considered when developing the instrument. All items are carefully matched to the theoretical construction of the model. Much care has been taken to ensure that items are both relevant and representative of the construct being measured (Messick, 1988). Substantive validity, on the other hand, refers to the convergent and discriminant characteristics of the construct.

Convergent validity is usually assessed using factor analysis (Klein, Astrachan, & Smyrnios, 2005: ; Kreiser, Marino, & Weaver, 2002: ; Moriano, Palací, & Morales, 2006). In our sample, the Kaiser-Meyer-Olkin test for sample adequacy was notably high (0.912), and Bartlett's sphericity test highly significant ($p < 0.001$). Both statistics suggest data are suitable for factor analysis. A Kolmogorov-Smirnov test was performed to check for normality in the items' distribution. Since normality was not supported, the extraction method selected was principal axis factorization. Three factors with eigenvalues greater than 1 emerged, whereas the fourth eigenvalue was 0.998. Therefore, the scree plot was considered, which suggested a four-factor solution. Cumulative variance explained by the extraction was 72.2%. Table 2 presents the rotated factor matrix. As may be observed, all items loaded on the expected factor only.

Table 2 around here

Discriminant validity may be assessed looking at correlations. Items should correlate more strongly with their own construct than with any other, indicating that they are perceived by respondents as belonging to their theoretical construct (Messick, 1988). In this sense, in Table 3 the average item-construct correlation has been computed for each construct. As may be observed, correlations of each item to other constructs are always below the average correlation with their own construct.

Table 3 around here

Obviously, these psychometric properties should be tested again on different samples. Nevertheless, initial results suggest the EIQ might fulfill reliability and validity requirements. Therefore, we will use it in the second part of our study.

CROSS-CULTURAL EMPIRICAL ANALYSIS

The EIQ developed in the previous section will now be used in this second part of the study. The cross-cultural applicability of the entrepreneurial intention model, and the specific role of cultural values, will be analyzed. An enlarged Spanish sample was used, together with a Taiwanese one.

Sample characteristics

For the Spanish sample, another two universities were included (Pablo Olavide and Jaen universities), to be added to the 310 original usable questionnaires from Seville. Data collection procedure was similar. In this manner, we collected another 77 questionnaires (November 2004). All of them had less than 2% of missing data, and no foreigners or visiting students filled them in, so they were all usable. Separate analyses were performed on the initial sample and the new one. In this latter sample, there were more women (64.9%) and all respondents were business students (economics is not on offer at these two universities).

Finally, of the 387 total respondents, 71.9% of them are business students, the rest being essentially students of economics (26.8%). 55.8% of the respondents are female, while the average age is 23.6 years.

The Taiwanese sample was obtained from the eighth edition of the Technology Innovation Competition (February 2006). This is the largest business plan competition in Taiwan for university students. One of the steps consists of a 3-day winter camp. It was during this stage that the fieldwork was carried out. Each competing team was made up of four to seven members. Two of them were randomly selected from each competing team and asked to complete the survey. Questionnaires were administered to 180 participants, 132 valid questionnaires being collected (73.9%). Average age was 23.1 years and 42.1% of respondents were female. Again, business is the most common degree (60.6%), followed by engineering (24.4%), the rest being mostly health and life sciences.

Regarding EIQ translation, the instrument was originally and simultaneously developed in Spanish and English. Three researchers (one Spanish and two native

English) made independent bidirectional translations. Any concern or discrepancy was jointly solved. A Chinese version was used in Taiwan, based on the English version and translated by one of the authors. Three graduate students then checked the translation independently. A joint session served to solve discrepancies. Finally, the EIQ was completed by a different student, who found no problems in understanding and answering the questions.

Table 4 around here

Some differences do arise between both samples, as might be expected (see Table 4). In the first place, the Spanish sample includes significantly more women. Similarly, knowing an entrepreneur is more common in Spain (86.3% compared to 48.1% of the Taiwanese sample). On the other hand, even though the proportion of respondents having work experience is broadly similar (43.4% to 36.4%), Taiwanese students have much higher self-employment experience. These differences might have relevant effects on the variables in the entrepreneurial intention model. For this reason, we will include these demographics as control variables in the statistical analysis.

Structural analysis

The entrepreneurial intention model to be tested has been presented in Figure 1. Structural equation modeling was used to test its empirical validity (Gefen, Straub, & Boudreau, 2000). However, as a first step, reliability and validity analyses were

performed for each sub-sample. Thus, Cronbach's alphas ranged from 0.776 to 0.953. Factor analysis resulted in four factors being extracted (all of them with eigenvalues greater than 1), fully corresponding to theoretical expectations.

According to the theory, external variables will exert their direct influence only on the intention antecedents. For this reason, control variables are included as explaining personal attitude, subjective norm and PBC. Age is measured in years. The other four demographic variables are dichotomic 0/1. The value 1 means male (in the 'Gender' variable), knows personally an entrepreneur (in 'Role Model'), has self-employment experience (in 'SelfEmpl Exper'), and has labor experience (in 'Work Exper'). The value 0 means the opposite. Therefore, positive relationships are expected for these demographics with the intention antecedents, as possessing these characteristics would be associated with more favorable perceptions.

The statistical analysis has been carried out using PLSGraph v.3.00 (Chin & Frye, 2003) The initial model to be tested was presented in Figure 1. Apart from human capital and demographic variables, a country dummy has also been included (labeled Taiwan) to account for possible cultural country differences. In this case, a direct influence of this dummy on intention was initially drawn to reflect the possibility of the way intentions are formed differing in each culture.

After running the statistical software on these data, a number of non-significant path coefficients were found. A recursive method has been used to eliminate the path with the lowest t-statistic at each iteration, until all coefficients were significant at least at the 95% level ($p < 0.05$). Figure 2 presents the results for the combined sample. As may be observed, the core entrepreneurial intention model is generally supported by this analysis, with the only exception of the subjective norm-intention relationship. Therefore, hypotheses H1 and H2 are confirmed, whereas H3 is not. The

relative strength of this motivational factor has already been identified as a pending issue in intention models.

It has been argued above that the main influence of subjective norm would be exerted through its effects on personal attitude and PBC. Hypotheses H4 and H5 were intended to test this possibility. They have been fully supported since both paths are significant.

Demographic and human capital variables have relatively few significant effects on the antecedents of entrepreneurial intention and, in general, they are small in magnitude. The signs of coefficients, however, are as expected. Only the effect of gender (being male) on PBC is considerably large (0.225).

Figure 2 around here

This model explains 55.5% of the variance in entrepreneurial intention based on PA and PBC. This result is highly satisfactory, since most previous research using linear models typically explain less than 40%. Besides, the model also serves to explain nearly 20% of the variance in PA and PBC, thanks to the important contribution of SN.

These results also indicate that significant cultural differences between these two samples probably exist, since the country-dummy coefficients are significant. Nevertheless, no significant direct effect on EI was found from this variable. This would mean that, starting from perceptions, intentions are formed the same way in the

European country and the Asian country studied, pointing to the universal applicability of the planned behavior approach in entrepreneurship.

However, there are significant differences with respect to levels of those antecedents: personal attitude, subjective norm and PBC. Taiwanese respondents tend to perceive much lower support in their closer environment (-0.367) than Spanish do. In contrast, they state a higher personal attitude (0.261) and, to a lesser extent, PBC (0.108). Nonetheless, testing cultural hypotheses (H6 and H7) requires performing separate analyses of each national sub-sample.

Figure 3 around here

Figure 3 presents comparative results for each sub-sample. Paths that are significant in both cases are drawn as a full line. Both path coefficients are included (Spain/Taiwan). Paths that are significant in one sub-sample only (Spain in all instances) are drawn as a dashed line. Hypotheses H1, H2, H4 and H5 fully hold for each sub-sample, adding robustness to our results. Meanwhile, H3 is rejected in both cases, as it was in the combined sample. Similarly, variance explained by the model is even higher than it was for the combined sample (over 57.8%).

Regarding possible cultural specificities, some notable differences are found between the path coefficients. Subjective norm exerts a stronger influence over both PA and PBC in Taiwan. This result would support hypothesis H6. This stronger effect cannot be confirmed for the SN-EI relationship, since this latter path is not significant.

Hypothesis H7 stated that the relative influence of PA and PBC on EI would be different depending on the country. In the Spanish sub-sample, PA exerts the stronger effect (0.677 vs. 0.169 for PBC). In Taiwan, PBC is the strongest predictor of EI (0.579 vs. 0.301 for PA). Therefore, H7 would be supported.

The number of human capital and demographic variables significantly influencing motivational factors is notably different. In Taiwan there is only one of them, linking self-employment experience to subjective norm. Smaller sample size probably accounts for this lower presence of significant variables. The SelfEmpl.Exp-SN relationship holds for both sub-samples. This would be indicating that, regardless of culture, having been an entrepreneur before significantly improves perceived approval by 'reference people'. On the other hand, age is not significant in either sample. This would be probably explained by the short age span considered. A new study of the general population may be needed to more accurately assess the role of age.

DISCUSSION

The first part of this study describes the construction and validation of an entrepreneurial intention questionnaire (EIQ). All items in the questionnaire are based on the theory and have taken previous empirical literature as a reference. In this sense, a decision was made to use aggregate measures for the three motivational antecedents (PA, SN and PBC). This decision may not be too problematic with regard to PA and PBC. However, with respect to SN, it has been relatively frequent in the past to moderate direct responses about reference people's approval with their relative 'motives to comply'. The decision was taken to keep the EIQ as parsimonious as

possible. Nevertheless, it may be argued that part of the results (in particular, rejection of hypothesis H3) may be a consequence of this specific design of the SN measure.

Previous research using a 'subjective norm' X 'motives to comply' measure has found a significant relationship with EI (Kolvereid, 1996b; Kolvereid & Isaksen, 2006; Tkachev & Kolvereid, 1999). On the other hand, the simpler 'subjective norm' measure has most often been non-significant (Autio et al., 2001; Krueger et al., 2000). A specific comparison of these two alternative measures using structural equations would probably be appropriate to help clarify their relative properties. Then, a modification of this measure in the EIQ may be needed.

Another characteristic of the EIQ is its consideration of entrepreneurship as not opposed to employee. To test this hypothesis, we used Spearman correlation coefficients (since the Kolmogorov-Smirnov test suggested distributions were not normal). Two items similar to those used by Autio et al. (2001) were checked. Correlation between 'attraction towards salaried work' and 'attraction towards entrepreneurship' takes a significant value of -0.307 ($p < 0.001$). Though it is negative, its magnitude is relatively small, suggesting that respondents do not see them as exact opposites. The value for the Spanish sample is slightly larger -0.362 and equally significant ($p < 0.001$), but it is much lower (-0.129) and non significant for the Taiwanese sample. Therefore, although Spaniards still see them partially as alternative options, it seems that in Taiwan this is not the case at all. Future research should be developed to confirm that these two career options are not perceived as completely opposed. In this case, there would be a strong case for using unconditional measures of both personal attitude and entrepreneurial intention in future research, in line with recent reasoning by Kolvereid & Isaksen (2006).

The validation procedure has yielded satisfactory results. Scales are reliable and valid when tested on the initial Spanish sample. Besides, the enlarged sample for Spain, and that of Taiwan also offered satisfactory psychometric properties (though not reported in detail due to reasons of space). In this sense, we are confident that the EIQ may be an adequate instrument to analyze entrepreneurial intentions. The follow-up study will try to verify the intention-behavior link.

Based on the findings presented in this paper, strong support for the entrepreneurial intention model could be claimed. The applicability of the TPB to entrepreneurship had received wide empirical support in the past, though not without some exceptions (Kolvereid & Isaksen, 2006). The originality of this paper resides in testing it on a two-country sample, considering the role of culture, with a newly developed instrument, and specifying the structural relations between the intention antecedents.

General results are satisfactory, since most hypotheses have been confirmed, and the explained variance is notably high. In particular, four of the five original core-model relationships were significant. Subjective norm would exert its influence on both PA and PBC (which in turn explain intention), but not directly on intention. Demographic or human capital variables, on the other hand, exert their effect on those antecedents. The existence of direct relationships between external variables and entrepreneurial intention was tested, with none resulting significant.

Results suggest that the traditional specification of the entrepreneurial intention model -based on linear regressions- may not be completely adequate. It would seem that perceived subjective norm does not play a direct role in determining entrepreneurial intention. Its effect would rather be indirect. This holds for both the Spanish and Taiwanese samples. It may be argued that social pressures act modifying

personal attitude and PBC levels. When individuals feel that ‘reference people’ would approve of their decision to become entrepreneurs, they would be more attracted towards that option and feel more able to perform it satisfactorily. Nevertheless, other researchers have found a direct and significant relationship between subjective norm and entrepreneurial intention. However, their analyses were based on linear regression models, and not on structural equations such as ours.

It is important to note that the same hypotheses (H1, H2, H4 and H5) are confirmed for the combined sample and for each of the national sub-samples. This holds despite national differences between both countries, and even some differences in sample characteristics. Therefore, the robustness of the model seems to be confirmed.

For the combined sample, a country dummy was included to explain the three motivational antecedents and entrepreneurial intention itself. This latter relationship was not significant, whereas the effect on the three antecedents was. This, in our opinion, reinforces the cross-cultural applicability of the entrepreneurial intention model, since intention is explained by its motivational factors regardless of the country. This would mean that the effect of demographics on perceptions differs for each country, depending possibly on cultural and social differences. On the other hand, the formation of intention from its antecedents is essentially similar in both samples. Thus, internal cognitive mechanisms would be the same for all people. That is, the ‘lenses’ through which each of us ‘see’ reality may differ in a cultural or social manner, but our way of ‘elaborating’ on what we have ‘seen’ would be similar.

In this case, Taiwanese respondents have more favorable perceptions about their personal attitude and PBC towards firm creation than Spaniards do. Cultural disparities may be responsible for this difference, as stated in hypotheses H6 and H7.

However, it may also be the case that sample characteristics account for part of this difference, since the Taiwanese sample is made up of participants in a business plan competition. On the other hand, Taiwanese respondents have much lower levels of perceived subjective norm. This is more difficult to explain by sample characteristics. Instead, it could be more logically attributed to cultural factors.

The role of culture in explaining entrepreneurial intentions is probably very relevant. Cultural values would exert their influence on the three motivational antecedents, and on their relative strength in explaining intention. In our study, two additional hypotheses (H6 and H7) were included to test the influence of culture. Hypothesis H6 is relatively straightforward, since the literature recognizes that individuals in collectivistic cultures tend to be more influenced by other's opinions (Ajzen, 2001; Begley & Tan, 2001; Mcgrath et al., 1992).

Hypothesis H7 is more exploratory in nature. It derives from two parallel arguments. Firstly, salient beliefs seem to be different between both countries. In Spain entrepreneurship would be more closely associated with enjoyment and satisfaction (Uslay et al., 2002). Therefore, it is reasonable to assume that personal attitude would be a stronger predictor of entrepreneurial intention than in Taiwan. On the other hand, uncertainty avoidance is higher in Spain, so respondents here would feel less capable of coping with the uncertainty of start-up even if they have the necessary skills. Thus, PBC would be a weaker predictor of entrepreneurial intention than in Taiwan.

Given the complexity of culture, and the exploratory character of hypothesis H7, our results should be taken with caution until further research confirms them, or alternative hypotheses are formulated and tested. In particular, since sample characteristics are not identical, this difference may explain part of the variation in

PA-EI and PBC-EI relationships. Nevertheless, this is one of the first attempts to explain the specific role of certain cultural dimensions in entrepreneurial cognitions. Therefore, we call for new research that may confirm or refute our results.

Limitations and implications

Results from this study have to be taken with caution, as some limitations regarding the instrument or the sample may be present. In the first place, as mentioned above, the SN measure may be problematic. Other researchers argue that a 'SN' X 'motives to comply' measure would be more adequate. If this is true, hypotheses H3, H4, H5 and H6 might be affected. A new analysis using structural equation systems with alternative measures of SN may be needed to confirm our results.

On the other hand, the fact that the items making up each scale were listed adjacent and always positive may have had an influence on respondents (acquiescence bias). This study should be replicated with a modified questionnaire to check the results. Nevertheless, this problem may artificially increase reliability and validity measures, but would not *per se* improve results of the structural model (sign, magnitude and significance of the path coefficients).

A sample made up of university students is very common in entrepreneurial intention research. It offers the advantage of similar age and qualifications, making it more homogeneous. However, in multinational studies, it is very difficult to obtain fully comparable samples. In our case, the Taiwanese students were participating in a business plan competition, while the Spanish were not. It may be possible that this circumstance has conditioned their answers and, thus, the results. Nevertheless, we ran the analysis only for business students in both countries, to make them the most

similar possible. Factor analysis results were broadly equivalent, and the same happened with the structural analysis.

Implications of our results may be derived in at least two areas. Firstly, regarding entrepreneurship education, more attention should be paid to the effect of different contents on cognitions (Kuratko, 2005). Business plan elaboration is the basic instrument provided by the great majority of courses and programs (Honig, 2004). However, some recent studies indicate that a course consisting only of the production of a business plan may have a negative effect on personal attitude (Carrier, 2005). Therefore, the case for a wider entrepreneurship education program would be strengthened. Contents specifically designed to increase personal attitude and subjective norm should be included. In particular, this latter element appears to play a very relevant role. However, we still know very little about ways of improving perceived subjective norm. This is an obvious path for future research.

Secondly, implications for public decision-makers could also be derived. If future research confirms that subjective norm is a previous element helping to determine personal attitude and PBC, there is a strong case for the promotion of an entrepreneurially-friendly culture in each society. The better entrepreneurship is valued as a career option, the higher the probabilities that people would perceive favorable subjective norm in their closer environment. This effect would be stronger in more collectivistic cultures, since the influence of SN over PA and PBC would be higher there. Every opportunity should be taken to recognize the role of entrepreneurs in the economy. Legal reforms that facilitate firm creation –for instance- would be important not only as such, but because they transmit the message that becoming an entrepreneur is a positively-valued option.

CONCLUSIONS

The present paper has addressed some still unsolved issues regarding entrepreneurial intention. In the first place, it has tried to test the applicability of the entrepreneurial intention model in two different cultural environments: Spain and Taiwan. Secondly, it has used a newly-developed instrument (EIQ) to measure the relevant cognitive constructs. Thirdly, it has considered the particular role of perceived subjective norm through a specific structural pattern of relationships between the elements of the model. Finally, it has included specific hypotheses to test the role of cultural dimensions in entrepreneurial cognitions. Reliability and validity measures suggest the EIQ may be generally adequate, though there still may be room for improvement of the research instrument.

Results have supported most of our hypotheses. It seems that the model holds for different countries. Cultural and social particularities would be reflected by the effect of external variables on the antecedents of intention (subjective norm, personal attitude and PBC) and also by the relative strength of links between these cognitive constructs. In particular, the individualism-collectivism dimension seems to explain the relative importance of SN in the model. Similarly, beliefs associated with entrepreneurship in each culture seem to vary, resulting in the relative strength of each motivational factor being different (especially, PA and PBC).

In particular, our results seem to confirm that the cognitive process from perceptions to intention is essential similar in different cultures. At most, the relative importance of each antecedent in the configuration of intention may differ, but intentions would always be formed based on the three motivational antecedents. National particularities manifest themselves in the way people apprehend reality and

transform it into perceptions towards entrepreneurship. Similarly, subjective norm would be the first step in the mental process, acting as a first filter to external stimuli and thus influencing perceptions of personal attitude and PBC.

Future research should be developed to confirm our findings. In particular, this study should be replicated with a wider sample from different countries. Additionally, more than 80% of participants in this study provided contact data. It is thus our purpose to follow up these students to test the intention-behavior relationship.

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APPENDIX

Measures of core entrepreneurial intention model elements

Personal attitude

11. Indicate your level of agreement with the following sentences from 1 (total disagreement) to 7 (total agreement).

	1	2	3	4	5	6	7
11.a- Being an entrepreneur implies more advantages than disadvantages to me	☐	☐	☐	☐	☐	☐	☐
11.b- A career as entrepreneur is attractive for me	☐	☐	☐	☐	☐	☐	☐
11.c- If I had the opportunity and resources, I'd like to start a firm	☐	☐	☐	☐	☐	☐	☐
11.d- Being an entrepreneur would entail great satisfactions for me	☐	☐	☐	☐	☐	☐	☐
11.e- Among various options, I would rather be an entrepreneur	☐	☐	☐	☐	☐	☐	☐

Subjective norm

13. If you decided to create a firm, would people in your close environment approve of that decision? Indicate from 1 (total disapproval) to 7 (total approval).

	1	2	3	4	5	6	7
13.a- Your close family	☐	☐	☐	☐	☐	☐	☐
13.b- Your friends	☐	☐	☐	☐	☐	☐	☐
13.c- Your colleagues	☐	☐	☐	☐	☐	☐	☐

Perceived behavioral control

15. To what extent do you agree with the following statements regarding your entrepreneurial capacity? Value them from 1 (total disagreement) to 7 (total agreement).

	1	2	3	4	5	6	7
15.a- To start a firm and keep it working would be easy for me	☐	☐	☐	☐	☐	☐	☐
15.b- I am prepared to start a viable firm	☐	☐	☐	☐	☐	☐	☐
15.c- I can control the creation process of a new firm	☐	☐	☐	☐	☐	☐	☐
15.d- I know the necessary practical details to start a firm	☐	☐	☐	☐	☐	☐	☐
15.e- I know how to develop an entrepreneurial project	☐	☐	☐	☐	☐	☐	☐
15.f- If I tried to start a firm, I would have a high probability of succeeding	☐	☐	☐	☐	☐	☐	☐

Entrepreneurial intention

18. Indicate your level of agreement with the following statements from 1 (total disagreement) to 7 (total agreement)

	1	2	3	4	5	6	7
18.a- I am ready to do anything to be an entrepreneur	☐	☐	☐	☐	☐	☐	☐
18.b- My professional goal is to become an entrepreneur	☐	☐	☐	☐	☐	☐	☐
18.c- I will make every effort to start and run my own firm	☐	☐	☐	☐	☐	☐	☐
18.d- I am determined to create a firm in the future	☐	☐	☐	☐	☐	☐	☐
18.e- I have very seriously thought of starting a firm	☐	☐	☐	☐	☐	☐	☐
18.f- I have the firm intention to start a firm some day	☐	☐	☐	☐	☐	☐	☐

Figure 1
Entrepreneurial intention model

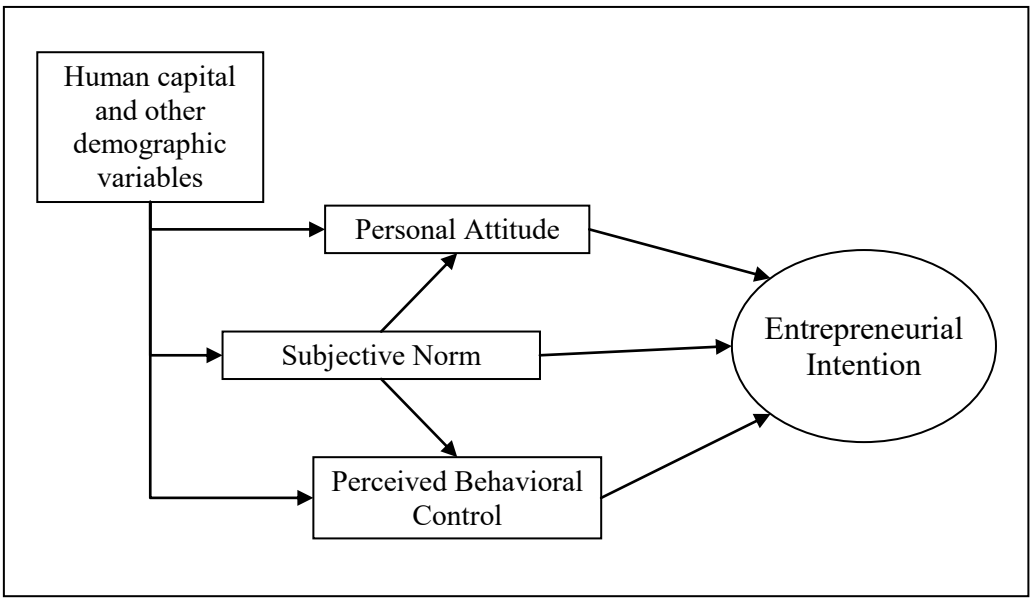
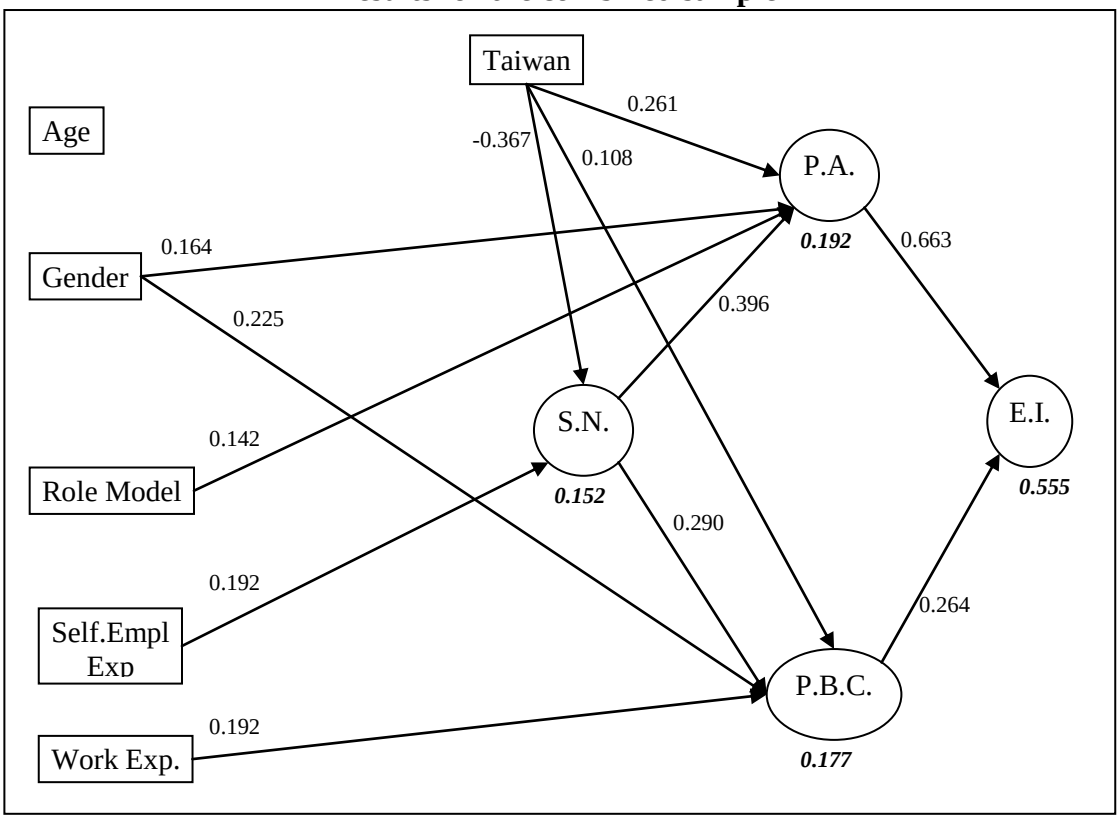
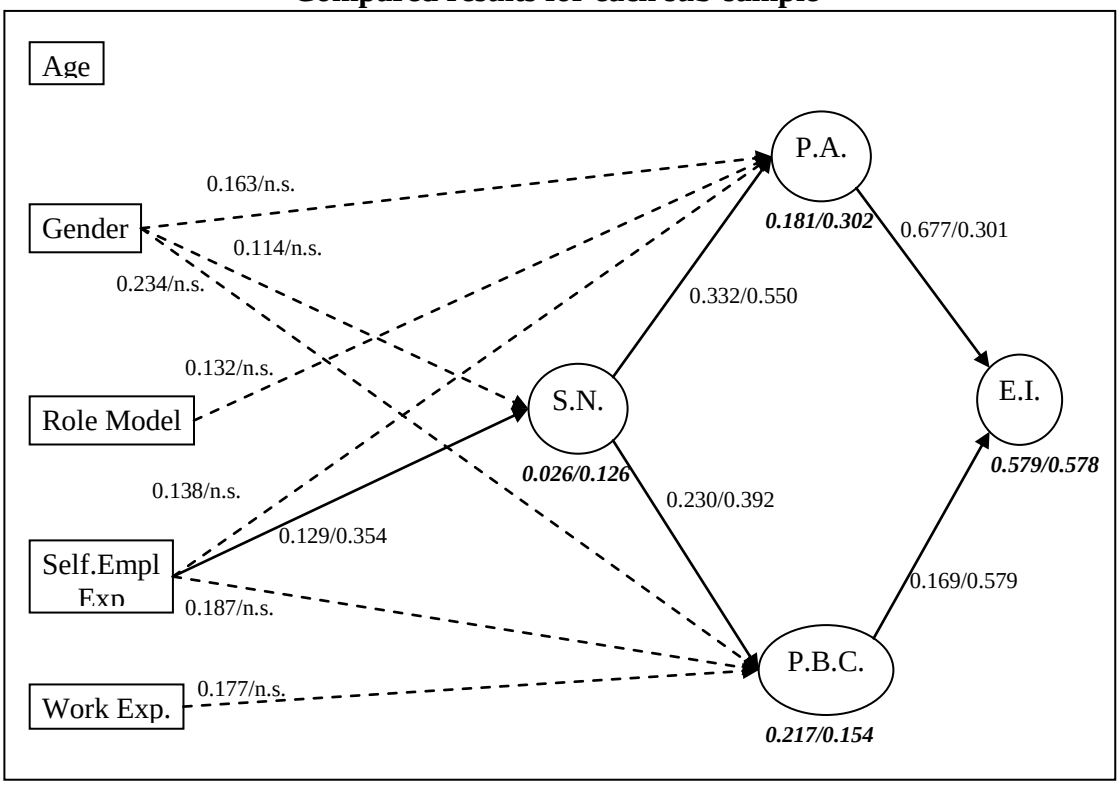


Figure 2
Results for the combined sample



Only significant path coefficients included. ***Numbers*** below the constructs indicate variance explained.

Figure 3
Compared results for each sub-sample



Spain/Taiwan. n.s. = non-significant in the Taiwanese sub-sample. ***Numbers*** below the constructs indicate variance explained.

Table 1
Hypotheses

No.	Description	
H1	Personal attitude positively influences entrepreneurial intention	PA → EI
H2	Perceived behavioral control positively influences entrepr. intention	PBC → EI
H3	Subjective norm positively influences entrepreneurial intention	SN → EI
H4	Subjective norm positively influences personal attitude	SN → PA
H5	Subjective norm positively influences perceived behavioral control	SN → PBC
H6	Subjective norm exerts a stronger effect on PA and PBC in the less individualistic country (Taiwan).	Tw → SN+
H7	The relative effect of PA and PBC on EI differs by country (PA effect on EI stronger in Spain, PBC effect stronger in Taiwan)	Sp → PA+ Tw → PBC+

Table 2
Rotated factor matrix and reliability indicators

	Factor			
	EI	PBC	SN	PA
11a personal Att.				-.639
11b personal Att.				-.640
11c personal Att.				-.762
11d personal Att.				-.756
11e personal Att.				-.608
13a subj. norm			.480	
13b subj. norm			.997	
13c subj. norm			.760	
15a p. beh. control		.652		
15b p. beh. control		.731		
15c p. beh. control		.824		
15d p. beh. control		.714		
15e p. beh. control		.773		
15f p. beh. control		.648		
18a entrep. intent.	.654			
18b entrep. intent.	.839			
18c entrep. intent.	.865			
18d entrep. intent.	.914			
18e entrep. intent.	.782			
18f entrep. intent.	.856			
Cronbach's α	0.943	0.885	0.773	0.897

Note: Extraction method: principal axis factorization. Rotation method: Oblimin Normalization with Kaiser. Rotation converged after 6 iterations. Loadings below 0.40 not shown.

Table 3
Item-construct correlations

	EI	PBC	SN	PA
11a personal Att.	0.461	0.344	0.242	
11b personal Att.	0.700	0.298	0.318	
11c personal Att.	0.700	0.306	0.326	0.834
11d personal Att.	0.609	0.317	0.363	
11e personal Att.	0.719	0.325	0.285	
13a subj. norm	0.214	0.238		0.318
13b subj. norm	0.119	0.208	0.766	0.270
13c subj. norm	0.117	0.152		0.240
15a p. beh. control	0.315		0.126	0.343
15b p. beh. control	0.450		0.233	0.447
15c p. beh. control	0.375	0.793	0.306	0.347
15d p. beh. control	0.192		0.165	0.161
15e p. beh. control	0.340		0.164	0.270
15f p. beh. control	0.459		0.296	0.317
18a entrep. intent.		0.278	0.138	0.620
18b entrep. intent.		0.308	0.201	0.718
18c entrep. intent.	0.880	0.383	0.247	0.701
18d entrep. intent.		0.426	0.152	0.662
18e entrep. intent.		0.469	0.199	0.656
18f entrep. intent.		0.393	0.138	0.639
EI	1.000	0.428	0.198	0.765
PBC	0.428	1.000	0.261	0.370
SN	0.198	0.261	1.000	0.353
PA	0.765	0.370	0.353	1.000

Table 4
Sample characteristics

	Spain			Taiwan			Total		
	N	Mean	Std.Dev.	N	Mean	Std.Dev.	N	Mean	Std.Dev.
Age	386	23,632	3,104	125	23,088	2,978	511	23,499	3,080
Gender*	387	0,442	0,497	125	0,584	0,495	512	0,477	0,500
Degree studied	385			126			511		
Business		71.9%			60.3%			69.1%	
Economics		26.8%			----			20.2%	
Engineering		----			24.6%			6.1%	
Other		1.3%			15.1%			4.7%	
Work experience	387	0,434	0,496	132	0,364	0,483	519	0,416	0,493
Self-empl. exper.**	387	0,023	0,151	129	0,085	0,280	516	0,039	0,193
Know entrepreneur*	387	0,863	0,344	131	0,481	0,502	518	0,766	0,424

* Country difference is significant ($p < 0.01$). ** Significant at the 99.9% level ($p<0.001$)