

USING THE THEORY OF PLANNED BEHAVIOR TO PREDICT NASCENT ENTREPRENEURSHIP*

UTILIZANDO LA TEORÍA DEL COMPORTAMIENTO PLANEADO PARA PREDECIR EL EMPRENDIMIENTO NACIENTE

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ABSTRACT

This study focuses on the factors that lead individuals to create new ventures. It draws on the social psychology literature and applies the theory of planned behavior to understand and predict nascent entrepreneurship. To test the integrity of this theory in predicting entrepreneurial behavior, this study uses data from the Global Entrepreneurship Monitor (GEM) research program in Peru. The findings of the study provide partial support for the theory. Implications of these findings are discussed.

Key words: Entrepreneurship, nascent entrepreneurship, entrepreneurial behavior, theory of planned behavior, Global Entrepreneurship Monitor, Latin America.

RESUMEN

Este estudio analiza los factores que hacen que las personas creen nuevos negocios. El estudio se basa en la literatura sobre psicología social y aplica la teoría del comportamiento planeado para entender y predecir emprendimientos nacientes. Para probar la bondad de la teoría en predecir el comportamiento emprendedor, este estudio usa datos del programa de investigación del Global Entrepreneurship Monitor (GEM) en Perú. Los resultados del estudio brindan un soporte parcial a la teoría. El estudio discute las implicancias de sus hallazgos.

Palabras clave: emprendimiento, emprendimiento naciente, comportamiento emprendedor, teoría del comportamiento planeado, GEM, Latinoamérica.

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1. Introduction

Entrepreneurship has become a key factor for economic growth (Baumol, 1993; Lumpkin and Dess, 1996; Reynolds, 1999). Entrepreneurship contributes to economic performance by introducing innovations, creating competition and enhancing rivalry (Carree and Thurik, 2003; Wennekers and Thurik, 1999; Wong, Ho, and Autio, 2005). In the particular case of Latin American countries, where much of the entrepreneurial activities are necessity-based, it is through the creation of innovative and competitive new ventures that entrepreneurship can also contribute to economic development (Acs and Amorós, 2008).

Because of its impact in recent history, interest in entrepreneurship has been growing. In the academic arena, such interest is manifested by the increasing amount of research devoted to the subject (Low and McMillan, 1988). This research has approached the study of entrepreneurship from a variety of perspectives denoting, however, a lack of agreement in such fundamental issues as the definition of entrepreneurship and the research questions that should be investigated (Gartner, 1985; Low and McMillan, 1988; Shane and Venkataraman, 2000; Shook, Priem and McGee, 2003). After a critical analysis of the extant research, Gartner (1989) concluded that to understand the phenomenon of entrepreneurship, researchers should focus on the process by which new organizations are created. The entrepreneurial process involves the nexus of two phenomena: the presence of lucrative opportunities and the presence of enterprising individuals (Shane and Venkataraman, 2000; Venkataraman, 1997).

The study of the enterprising individual has also been approached from a variety of perspectives (Shane, 2000). A growing stream of research views the creation of new ventures as the direct outcome of an individual's intentions and consequent actions, influenced by environmental conditions (Bird, 1988, 1992). The intention to form a particular venture "operates as a perceptual screen for viewing relationships, resources, exchanges, and the like. That is, intention directs attention. Intention also directs action in alignment with its

focus" (Bird, 1992, p. 11). Even though some intention models have been proposed (e.g., Bird, 1988, 1992; Shapero and Sokol, 1982), a research stream grounded on social psychology theories have started to accumulate. Two of the most prominent of these theories, the theory of reasoned action (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975) and the theory of planned behavior (Ajzen, 1988, 1991), an extension of the former, have attracted particular attention from entrepreneurship researchers.

In this study we review prior research that has applied the theory of planned behavior to understand and predict entrepreneurial behavior and develop an application of this theory within the context of the Global Entrepreneurship Monitor project in Peru. A brief discussion of the Peruvian context is presented below.

2. The theory of reasoned action and the theory of planned behavior

The theory of reasoned action posits that an individual's behavior is determined by the individual's behavioral intention to perform that behavior. Behavioral intention, in turn, is a function of two factors: the individual's attitude toward the behavior and subjective norm (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975). Figure 1 depicts the theory of reasoned action.

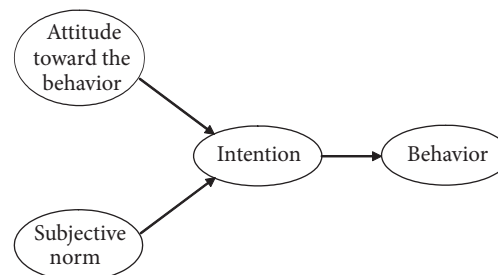


FIGURE 1. The theory of reasoned action.

Unlike general attitudes toward institutions, people, or objects, the attitude toward the behavior refers to the degree to which a person has a favorable or unfavorable evaluation appraisal of performing the particular behavior of interest. Subjective norm, the second determinant of intention, refers to the individual's

perception of social pressure to perform or not to perform the behavior under consideration (Ajzen, 1991).

The theory of reasoned action has been widely used in several disciplines to explain diverse types of behaviors including donating blood (e.g. Bagozzi, 1982), voting for a referendum initiative (e.g. Bowman and Fishbein, 1978), having a child (e.g. Crawford and Boyer, 1985), applying for a loan (e.g. Ryan and Bonfield, 1975), and adopting an information system (e.g. Venkatesh, Morris, Davis, and Davis, 2003) among others. In their meta-analysis of research using the theory of reasoned action, Sheppard, Hartwick and Warshaw (1988) concluded that their results provide strong support for its overall predictive utility.

The theory of planned behavior is an extension of the theory of reasoned action. As its predecessor, the theory of planned behavior is based on the assumption that human beings usually behave in a sensible manner; that they take account of available information and implicitly or explicitly consider the implications of their actions. Consistent with this assumption, the theory also postulates that performance of a specific behavior is a function of the intention to perform such behavior (Ajzen, 1988). The theory of planned behavior is depicted in Figure 2.

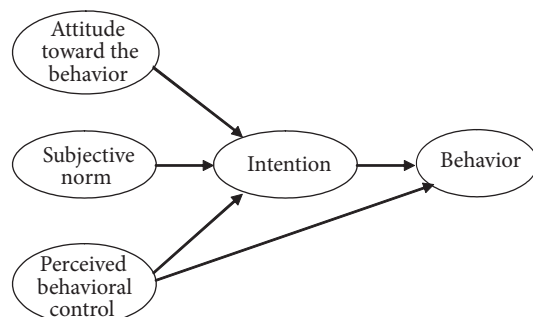


FIGURE 2. The theory of planned behavior.

The main difference between the theory of reasoned action and the theory of planned behavior is that the latter takes into account situations in which a person may have the intention to engage in a behavior but has no access to opportunities and/or resources (e.g. time, money, skills). Such opportunities and

resources are collectively regarded as the individual's control over the behavior or perceived behavioral control. Perceived behavioral control, then, refers to the sense of self-efficacy or ability to perform the behavior of interest (i.e. the perceived ease or difficulty of performing the behavior).

Based on the above, the theory states that to the extent that a person has the required opportunities and resources, and intends to perform the behavior, he or she should succeed in doing so. Further, it posits that people intend to perform a behavior when they evaluate it positively, when they experience social pressure to perform it, and when they believe that they have the means and opportunities to do so (Ajzen, 1988; 1991).

The theory of planned behavior has become one of the most influential theories of human behavior, having been applied in almost every discipline concerned with understanding some type of human behavior (Armitage and Conner, 2001; Cooke and Sheeran, 2004; Notani, 1998; Rivis and Sheeran, 2003; Schwenk and Möser, 2009). In their meta-analysis, Armitage and Conner (2001) found empirical support for the efficacy of the theory as a predictor of human behavior.

Because engaging in an entrepreneurial activity is for the most part a planned behavior and because the potential entrepreneur needs to have access to opportunities and resources (i.e. perceived behavioral control) to be able to start a business, the theory of planned behavior seems well suited to explain and predict entrepreneurial behavior (Krueger and Carsrud, 1993; Krueger, Reilly, and Carsrud, 2000).

3. Empirical entrepreneurship studies applying the theory of planned behavior

During the last few years some researchers have started to apply the theory of planned behavior in the context of entrepreneurship. Kolvareid (1996) applied the theory of planned behavior to predict employment status choice intentions among first-year undergraduate students at a Norwegian business school. He found that all three determinants, attitude, subjective norm, and perceived behavioral control, contributed

significantly to the explanation of intentions. Tkachev and Kolvereid (1999) studied employment intentions among medical and technical university students in Russia. They found that attitude, subjective norm, and perceived behavioral control determined employment status choice intentions and that role models and demographics did not explain intentions.

Krueger et al. (2000) applied a competing models approach to examine the theory of planned behavior and Shapero and Sokol's (1982) entrepreneurial event (SEE). Their sample comprised senior university business students facing career decisions. Overall, they found support for both models. In the case of the theory of planned behavior they found that both attitude and perceived behavioral control had significant effects on intention. The effect of subjective norm, however, was not significant.

Autio, Keeley, Klofsten, Parker and Hay (2001) applied the theory of planned behavior to analyze factors influencing entrepreneurial intent among university students from Finland, Sweden, the United States and the United Kingdom. They found that attitude, subjective norm and perceived behavioral control had significant effects on intention. Further, perceived behavioral control emerged as the most important determinant of entrepreneurial intent, with subjective norm the weakest one. The influence of subjective norm was not significant in the case of the United Kingdom sample.

In their longitudinal study of Norwegian business founders, Kolvereid and Isaksen (2006) applied a slightly different version of the theory of planned behavior. They used Bandura's (1986, 1997) self-efficacy construct instead of perceived behavioral control. They found that both attitude and subjective norm had significant influence on intention to become self-employed and that intention to become self-employed was strongly related to actual entry into self-employment. However, they found that self-efficacy did not add to the explanation of the variance of self-employment intention or behavior.

Fayolle, Gailly, and Lassas-Clerc (2006) used the theory of planned behavior to test the impact of an entrepreneurship-teaching program, a

three-day seminar focusing on the evaluation of new venture projects. Students enrolled in a Specialized Master in Management program at a French business school took part in the study. The authors found that all three determinants had significant influence on entrepreneurial intentions. Souitaris, Zerbinati and Al-Laham (2007) used a quasi-experimental design to assess the impact of entrepreneurship programs on intention toward self-employment and nascency as a proxy of entrepreneurial behavior. Their sample comprised science and engineering students from two European universities, one in London, UK, and the other in Grenoble, France. They found that attitude, subjective norm and perceived behavioral control had significant effects on intention to become self-employed. However, they found no significant relationship between intention and nascency at the end of the program. The authors attributed this lack of significance to the time-lag between entrepreneurial intention and behavior, which, they argue, is especially true for undergraduate students.

In their application of the theory of planned behavior, van Gelderen, Brand, van Praag, Bodewes, Poutsma, and van Gils (2008) assessed the influence of behavioral, normative and control beliefs on attitude, subjective norm, perceived behavioral control and intention. They surveyed undergraduate business students from four universities in The Netherlands. The results provide additional evidence for the usefulness of the theory of planned behavior in explaining entrepreneurial intention. Two beliefs, entrepreneurial alertness and (disregard for) financial security emerged as the most significant beliefs.

Gird and Bagraim (2008) examined the theoretical sufficiency of the theory of planned behavior by considering four additional factors that are believed to influence entrepreneurial intention (i.e. personality traits, situational factors, prior exposure to entrepreneurship, and demographics). Final-year commerce students at two universities in the Western Cape, South Africa, completed the survey questionnaire. It was found that the theory of planned behavior significantly explained entrepreneurial intentions. Of the three determinants of intentions,

attitude toward entrepreneurship exerted the greatest influence on intention while subjective norm had the weakest relationship with entrepreneurial intent. Among the other factors considered in the study, personality traits, demographic factors and situational factors did not add significantly to the variance explained by the theory of planned behavior. Self-employment experience, one of the three variables that measured prior exposure to entrepreneurship, was the only one to be found to significantly add to the predictive power of the theory.

Liñán and Chen (2009) tested the theory of planned behavior including human capital and demographic variables as antecedents of the determinants of entrepreneurial intention. University students in Spain and Taiwan completed a questionnaire. Results showed that both attitude and perceived behavioral control had significant effects on entrepreneurial intention. Even though subjective norm had no significant direct effect on intention, it had an indirect effect on intention through attitude and perceived behavioral control. Demographic and human capital variables, on the other hand, exerted influence on attitude, subjective norm, or perceived behavioral control, but not directly on intention.

To summarize, most of the published empirical studies that have applied the theory of planned behavior to predict entrepreneurial behavior found that attitude, subjective norm and perceived behavioral control had significant effects on entrepreneurial intention (i.e., Autio et al., 2001; Fayolle et al., 2006; Gird and Bagraim, 2008; Kolvereid, 1996; Souitaris et al., 2007; Tkachev and Kolvereid, 1999; van Gelderen et al., 2008). Overall, these results are consistent with those of applications of this theory on other disciplines (cf. Armitage and Conner, 2001).

Nevertheless, two of the reviewed studies found only partial support for the theory of planned behavior (i.e., Liñán and Chen, 2009; Krueger et al., 2000). In both studies only attitude and perceived behavioral control had significant direct effect on intention. In these studies, the effect of subjective norm was non-significant. Liñán and Chen (2009) found,

however, that subjective norm had an indirect effect on intention through attitude and perceived behavioral control. It should be noted that of the studies that did find subjective norm to have significant influence on intention, two found that subjective norm had the weakest influence on intention (i.e., Autio et al., 2001; Gird and Bagraim, 2008). Taken together, these results are similar to those found by Armitage and Conner (2001), who concluded that “subjective norm was the [theory of planned behavior] component most weakly related to intention” (p. 488).

It is worth mentioning that in all the empirical studies reviewed, entrepreneurial intention was the dependent variable. Only two of the studies focused on entrepreneurial behavior (i.e., Kolvereid and Isaksen, 2006; Souitaris et al., 2007). Kolvereid and Isaksen (2006) found that both attitude and subjective norm were significant predictors of self-employment intention and that intention had a significant influence on actual entrepreneurial behavior. However, Souitaris et al. (2007) found that intention to become self-employed was not related to propensity of being nascent entrepreneurs. As aforementioned, the authors attributed this lack of significance to the time-lag between entrepreneurial intention and behavior.

Finally, it should be noted that all but one study relied on university student samples. Even though in some cases the use of student samples may be appropriate (Krueger et al., 2000), entrepreneurs and not students are indeed the most knowledgeable sources of information about their own venture creation intentions and activities (Shook et al., 2003).

4. Research model and hypotheses

This study builds on previous studies that have applied the theory of planned behavior to understand and predict venture creation. The purpose of the study is to assess the integrity of the theory in explaining entrepreneurial behavior. Behavioral intentions were excluded from the study because the focus of this research was actual behavior. The research model is presented in Figure 3.

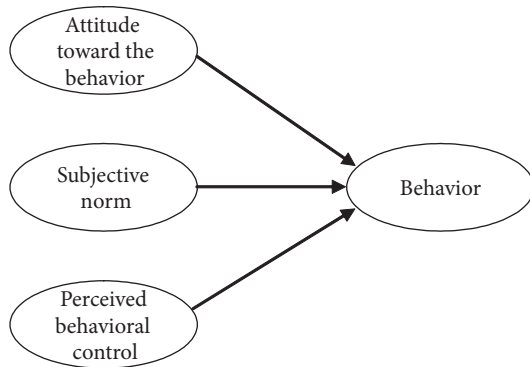


FIGURE 3. Research model.

In accordance with the theory of planned behavior, the following hypotheses are to be tested:

Hypothesis 1. The higher the attitude toward entrepreneurship, the higher the propensity to engage in entrepreneurial behavior.

Hypothesis 2. The higher the subjective norm with respect to entrepreneurship, the higher the propensity to engage in entrepreneurial behavior.

Hypothesis 3. The higher the perceived behavioral control with respect to entrepreneurship, the higher the propensity to engage in entrepreneurial behavior.

5. Research method

This study applied a survey research design using a questionnaire that was distributed to a representative sample of the Peruvian adult population in 2007 and 2009.

5.1. A brief summary of the Peruvian context

To understand the current Peruvian context, it is necessary to look back to the end of the 1980s, when Peru was experiencing a myriad of difficult national problems. During this period, the country was submerged in a galloping economic crisis with hyperinflation that was further exacerbated by terrorism, which claimed approximately 30,000 lives and caused an internal conflict that wreaked havoc to the country's economic development. In the 1990s, important measures were implemented to bring these problems under control. First, steps were taken to eradicate terrorism and set the bases

for future economic growth. In this context, drastic neo-liberal market policies were applied and fiscal accounts were balanced.

These measures generated an economic transformation that was in line with the dramatic social change seen in the country. Terrorism had caused massive migration from the provinces and particularly the highlands, where the majority of terrorist activity was concentrated. Large numbers of individuals had fled these areas to move to the coast and specifically the capital, Lima. These migrants were often unable to find jobs due to the widespread economic crisis and were forced to create their own opportunities. This saw the advent of informal employment and businesses (De Soto, 1989). This informal movement has been absorbed over the last few years as the country has moved towards more expansive economic growth and formalization. In fact, many of these informal operations have become formal small businesses that constitute the basis of a significant economic sector in the country.

The country's economic takeoff was particularly notable in the last decade as different economic measures were implemented to order internal accounts while the world economy experienced considerable expansion. The economic growth seen in the past few years has been based on a stable exchange rate and low inflation, which has made Peru one of the countries that has best weathered the global economic crisis without sacrificing profitability, private consumption or its macroeconomic stability. In a context of full-blown global deterioration, Peru received its third investment grade and reported figures that exceeded those achieved prior to the crisis in 2008.

Peru has amply demonstrated that it is one of the most entrepreneurial countries in the world. Several economic sectors in the country have reactivated and made significant contributions to the country's economic growth. In this context, success in traditional activities such as mining have been complemented by progress in areas such as agro-industry, which, due to strong international investment, has produced highly favorable results in the country's coastal valleys.

5.2. Sample

Data used in this study are from the 2007 and 2009 Global Entrepreneurship Monitor (GEM) –Peru research program. As part of the program, the Adult Population Survey (APS) was applied to representative samples of 2000 and 2021 individuals in 2007 and 2009, respectively. Randomly selected individuals between 18 and 64 years of age took part in the study. The data were collected nationwide between May and June, 2007 and 2009, on a face-to-face basis.

The GEM data collection covers the life-cycle of the entrepreneurial process and looks at individuals at the point when they commit resources to start a business they expect to own themselves (nascent entrepreneurs); when they currently own and manage a new business that has paid salaries for more than three months but less than 42 months (new business owners); and when they own and manage an established business that has been in operation for more than 42 months (established business owners). Table 1 presents the definition of each of these types of entrepreneurs.

TABLE 1. Nascent entrepreneur, new business owner, and established business owner.

Entrepreneur	Description
Nascent entrepreneur	Individual between 18 and 64 years old who is currently actively involved in setting up a business he or she will own or co-own; this business has not paid salaries, wages, or any other payments to the owners for more than three months.
New business owner	Individual between 18 and 64 years old who is currently an owner-manager of a new business, i.e., owning and managing a running business that has paid salaries, wages, or any other payments to the owners for more than three months, but not more than 42 months.
Established business owner	Individual between 18 and 64 years old who is currently an owner-manager of an established business, i.e., owning and managing a running business that has paid salaries, wages, or any other payments to the owners for more than 42 months.

5.3. Measures

The APS data document the behavior and characteristics of entrepreneurs and non-entrepreneurs. As such, the survey includes several items some of which parallels those used in other studies to measure the theory of planned behavior variables. The Spanish version of the APS, slightly adapted to the Peruvian case, was used to gather information.

5.3.1. Attitude toward entrepreneurship

Attitude toward entrepreneurship refers to the degree to which a person has a favorable or unfavorable evaluation appraisal of engaging in an entrepreneurial activity.

Several studies that have measured attitude toward entrepreneurship have conceptualized entrepreneurship as a career option (e.g. Autio et al., 2001; Gird and Bagraim, 2008). Autio et al. (2001) measured attitude toward entrepreneurship using one item that assessed the attractiveness of entrepreneurship as a career alternative. They used other single-items to measure the attractiveness of corporate, civil servant and academic careers. Gird and Bagraim (2008) used these same measures. It should be noted that both studies surveyed students facing the decision of a career choice. In discussing the appropriateness of this approach, Kolvereid & Isaksen (2006) argued that opposing entrepreneurship as a career alternative to a salaried work is a simplification because “it is not clear how to categorize people who combine working for an employer and running their own business” (p. 870).

Liñán and Chen (2009) developed a more comprehensive measure of attitude toward entrepreneurship. Their five-item measure goes beyond focusing on entrepreneurship as a career. Indeed, it includes items about the opportunity of starting a firm and the advantages and disadvantages of being an entrepreneur.

In the present study, attitude toward entrepreneurship was measured with two items, one showing a positive attitude toward entrepreneurship and the other one a negative attitude: “In the next six months there will be

good opportunities for starting a business in the area where you live” and “Fear of failure would prevent you from starting a business.” Respondents were asked to give a “yes” or “no” response to each item.

It can be argued that individuals who think that there will be good opportunities for starting a business in the area where they live will have a higher expectation about the success of start-ups and therefore a positive attitude toward entrepreneurship. On the other hand, individuals who do not think that there will be good opportunities will probably not be interested in engaging in an entrepreneurial activity and therefore will not have a positive attitude toward entrepreneurship.

It can also be argued that individuals who think that fear of failure would prevent them from starting a business will be less interested in starting a business and therefore will not have a positive attitude toward entrepreneurship. On the other hand, individuals who think that fear of failure would not prevent them from starting a business will probably be interested in engaging in an entrepreneurial activity and therefore will have a positive attitude toward entrepreneurship.

Each of the attitude toward entrepreneurship items was coded as a binary variable with “1” indicating a “yes” response and “0” indicating a “no” response. Clearly, a “yes” response to the first item shows a positive attitude while a “yes” response to the second item shows a negative attitude toward entrepreneurship. Hence, it is expected that the fear of failure item will have an inverse relationship with the opportunity item and with the rest of the theory of planned behavior constructs.

5.3.2. Subjective norm with respect to entrepreneurship

Subjective norm with respect to entrepreneurship refers to the individual’s perception of social pressure to perform or not to perform an entrepreneurial activity.

Previous studies have approached the measure of subjective norm in different ways. Kolvareid (1996) used three items to assess the extent to which respondents believed that three reference groups (closest family, friends, and peo-

ple who are important to them) thought that they should pursue a career as self-employed. Liñán and Chen (2009) asked respondents if they thought that three reference groups (close family, friends, and colleagues) would approve their decision to create a firm.

Autio et al. (2001), on the other hand, used four items to assess the extent to which the students who participated in their study thought that their university environment encouraged entrepreneurship. Two of the items used in their study are: “I know many people in my university who have successfully started up their own firm” and “In my university, you get to meet lots of people with good ideas for a new firm”. Gird and Bagraim (2008) adapted Autio et al.’s instrument in their study. By assessing the extent to which respondents actually know entrepreneurs, this approach tends to more closely evaluate the influence of their direct entrepreneurial environment on their decision to become an entrepreneur.

In the current study, subjective norm with respect to entrepreneurship was measured similarly to Autio et al.’s (2001). We used one item: “You know someone personally who started a business in the past 2 years”. Respondents were asked to give a “yes” or “no” response.

Knowing personally an entrepreneur may cause an individual to have the exposure to the experience and knowledge of somebody who has actually started a business. It can be argued that this exposure will cause the individual to perceive a pressure to also engage in an entrepreneurial activity. This is particularly likely in Peru given the high prevalence rates of nascent and new businesses. Indeed, according to the Global Entrepreneurship Monitor 2007 and 2009 Global Reports the early stage entrepreneurial activity (nascent and new business) rates for Peru were 25.9% and 20.9%, respectively, while the established business ownership rates 15.3% and 7.5%, respectively (Bosma, Jones, Autio, and Levie, 2008; Bosma and Levie, 2010). On the other hand, individuals who do not know entrepreneurs are less likely to feel any social pressure to start their own business.

Subjective norm was coded as a binary variable with “1” indicating a “yes” response and “0” indicating a “no” response.

5.3.3. Perceived behavioral control with respect to entrepreneurship

Perceived behavioral control with respect to entrepreneurship refers to the sense of self-efficacy or ability to perform the entrepreneurial activity (i.e. the perceived ease or difficulty of performing the entrepreneurial activity).

Autio et al. (2001) used a four-item instrument to measure subjective norm. These items included the following: “I have the skills and capabilities required to succeed as an entrepreneur” and “To start my own firm would probably be the best way for me to take advantage of my education.” Gird and Bagraim (2008) used Autio et al.’s (2001) four-item scale. Liñán and Chen (2009) used a six-item scale to measure perceived behavioral control. This scale included the following items: “I am prepared to start a viable firm,” “I know the necessary practical details to start a firm,” and “I know how to develop an entrepreneurial project.” These items focused on the respondent’s knowledge and capability to start a business.

In this study, perceived behavioral control with respect to entrepreneurship was measured with the following item: “You have the knowledge, skills and experience required to start a new business”. Respondents were asked to give a “yes” or “no” response.

Individuals who think that they have the knowledge, skill and experience to start a new business will feel the sense of self-efficacy or ability to start a new business (i.e., they will perceive that they can start a business without much difficulty). On the other hand, individuals who do not think that they have the knowledge, skill and experience to start a new business will perceive that they have much less control over the process of starting a business (i.e., they will perceive much more difficulty in starting a new business).

Perceived behavioral control was coded as a binary variable with “1” indicating a “yes” response and “0” indicating a “no” response.

5.3.4. Entrepreneurial behavior

To measure entrepreneurial behavior it was necessary to follow a procedure to identify nascent entrepreneurs and non-entrepreneurs. As aforementioned, nascent entrepreneurs are

those individuals who are actively involved in setting up a business they will own or co-own; this business has not paid salaries, wages, or any other payments to the owners for more than three months.

The APS includes a series of questions according to a procedure defined by the GEM consortium. A detailed explanation of this procedure can be found in Reynolds, Bosma, Autio, Hunt, De Bono, Servais, Lopez-Garcia, and Chin (2005). Figure 4 summarizes this procedure and a brief explanation is given below.

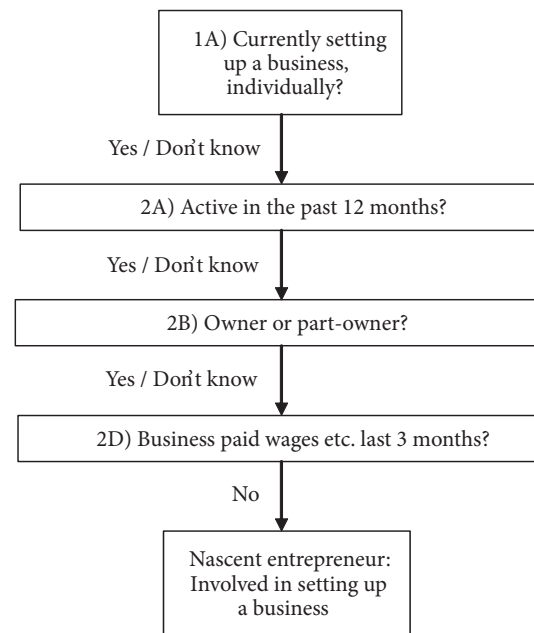


FIGURE 4. Identification of nascent entrepreneurs.

To identify nascent entrepreneurs, respondents were first asked: “You are, alone or with others, currently trying to start a new business, including any self-employment or selling any goods or services to others?” Because some people may answer “yes” to this question without being truly committed to starting a new venture while others may answer “don’t know” because they may not be sure if something they are currently doing would mean starting a new business, those who answered “yes” or “don’t know” were asked a follow-up question. Those who answered “yes” were asked: “You mentioned that you are trying to start a new business. Over the past 12 months have you done anything to help start a new business, such as

looking for equipment or a location, organizing a start-up team, working on a business plan, beginning to save money, or any other activity that would help launch a business?” Those who had answered “don’t know” to the first question were asked: “Perhaps we were not clear on a previous question. Over the past 12 months have you done anything to help start a new business, such as looking for equipment or a location, organizing a start-up team, working on a business plan, beginning to save money, or any other activity that would help launch a business?”

To make sure that the person would actually own the business, respondents who answered “yes” or “don’t know” to the follow-up question were then asked: “Will you personally own all, part, or none of this business?” Respondents who answered “all”, “part” or “don’t know” were finally asked: “Has the new business paid any salaries, wages, or payments in kind, including your own, for more than three months?” Those who answered “no” were coded as nascent entrepreneurs. Entrepreneurial behavior was coded as a binary variable with “1” indicating a nascent entrepreneur and “0” indicating a non-entrepreneur.

As aforementioned, data used in this study are from two samples, the 2007 and 2009 GEM Peru research program. After discarding cases with missing values, a total of 94 nascent entrepreneurs were identified in the 2007 sample. A total of 585 non-entrepreneurs who answered the set of attitude toward entrepreneurship, subjective norm, and perceived behavioral control items were also identified. Thus, the final total sample for 2007 comprised 679 individuals. On the other hand, 248 nascent entrepreneurs and 819 non-entrepreneurs were identified in the 2009 sample. Thus, the final total sample for 2009 comprised 1067 individuals.¹

¹ In the 2007 sample, a relatively large number of individuals, particularly nascent entrepreneurs, did not respond the attitude items of the survey. These are the items we use as measures of the theory of planned behavior variables. Because of the missing values, these individuals had to be dropped from the analysis. For the 2009 sample, special care was taken at the data collection stage to assure a higher response. This explains the sample size difference between both years.

6. Results

6.1. Effects of attitude toward entrepreneurship, subjective norm and perceived behavioral control on entrepreneurial behavior

Descriptive statistics and correlations among the variables are shown in Table 2.

The correlation matrix offers preliminary support for the three hypotheses. Indeed, most of the correlations between entrepreneurial behavior and each of its hypothesized determinants are significant and in the expected direction.

Since the dependent variable, entrepreneurial behavior, is a binary variable, the hypotheses were tested using binary logistic regression. Binary logistic regression estimates the probability of an event happening. In this case the event is engaging in an entrepreneurial behavior (i.e., being a nascent entrepreneur). In the binary logistic regression models entrepreneurial behavior was the dependent variable and the independent variables were attitude toward entrepreneurship-opportunities, attitude toward entrepreneurship-fear of failure, subjective norm, and perceived behavioral control. Table 3 shows the results of the binary logistic regression models. It can be seen that the theory of planned behavior variables accounted for 16,0% and 10,2% of the variance of entrepreneurial behavior for 2007 and 2009, respectively (Nagelkerke- $R^2 = 0,16$ and $0,102$).

Hypothesis 1 stated that “the higher the attitude toward entrepreneurship, the higher the propensity to engage in entrepreneurial behavior.” As mentioned before, two items measured attitude toward entrepreneurship: the first one was based on the perception of opportunities while the second one was based on fear of failure. As discussed above, the fear of failure item was expected to have an inverse relationship with entrepreneurial behavior. Table 3 shows that attitude toward entrepreneurship based on opportunities perception had a significant effect on entrepreneurial behavior in both 2007 and 2009. ($p < 0,05$ and $p < 0,001$, respectively). Attitude toward entrepreneurship based on fear of failure, on the other hand, had a significant effect on entrepreneurial behavior only in

TABLE 2. Descriptive statistics and Spearman correlations among the analysis variables.

	Mean	SD	1	2	3	4	5
1. Entrepreneurial behavior							
- 2007	0,14	0,352	1				
- 2009	0,23	0,425	1				
2. Attitude toward entrepreneurship-opportunities							
- 2007	0,61	0,488	0,155**	1			
- 2009	0,65	0,478	0,195**	1			
3. Attitude toward entrepreneurship-fear of failure							
- 2007	0,27	0,446	-0,130**	-0,066	1		
- 2009	0,32	0,463	-0,035	-0,097**	1		
4. Subjective norm							
- 2007	0,54	0,498	0,115**	0,172**	-0,003	1	
- 2009	0,64	0,482	0,073*	0,162**	0,004	1	
5. Perceived behavioral control							
- 2007	0,72	0,443	0,222**	0,238**	-0,228**	0,175**	1
- 2009	0,77	0,421	0,184**	0,220**	-0,094**	0,057	1

* $p < 0,05$, ** $p < 0,01$

TABLE 3. Binary logistic regression models (dependent variable = entrepreneurial behavior).

Predictor variable	Coefficient	Standard error	Exp(B)
Attitude toward entrepreneurship-opportunities			
- 2007	0,701*	0,280	2,016
- 2009	0,917**	0,185	2,502
Attitude toward entrepreneurship-fear of failure			
- 2007	-0,742*	0,333	0,476
- 2009	-0,039	0,165	0,961
Subjective norm			
- 2007	0,449	0,246	1,567
- 2009	0,216	0,162	1,241
Perceived behavioral control			
- 2007	2,292**	0,600	9,896
- 2009	1,151**	0,241	3,162
Nagelkerke-R ²			
- 2007	0,160		
- 2009	0,102		

* $p < 0,05$, ** $p < 0,001$

2007 ($p < 0,05$). Therefore, Hypothesis 1 was partially supported.

Hypothesis 2 stated that “the higher the subjective norm with respect to entrepreneurship, the higher the propensity to engage in entrepreneurial behavior.” Table 3 shows that the influence of subjective norm on entrepreneurial behavior was not significant neither in 2007 nor 2009. Therefore, Hypothesis 2 was rejected.

Hypothesis 3 stated that “the higher the perceived behavioral control with respect to

entrepreneurship, the higher the propensity to engage in entrepreneurial behavior.” Table 3 shows that perceived behavioral control had a significant effect on entrepreneurial behavior in both 2007 and 2009 ($p < 0,001$). Therefore, Hypothesis 3 was supported.

6.1. Opportunity and necessity driven entrepreneurship

The Global Entrepreneurship Monitor project identifies two entrepreneurial motivations: opportunity and necessity. Some individuals are

pulled into entrepreneurship because they recognize some business opportunities while others are pushed into entrepreneurship because they have no other means of making a living (Bosma et al., 2008). Therefore, to further the analysis, the influence of each of the three behavior determinants on entrepreneurial behavior was tested separating the responses of the individuals according to their entrepreneurial motivation.²

Table 4 shows the results of the binary logistic regression models that considered opportunity driven entrepreneurs and non-entrepreneurs. It can be seen that the theory of planned behavior variables accounted for 16,3% and 10,8% of the variance of entrepreneurial behavior for 2007 and 2009, respectively (Nagelkerke- $R^2 = 0,163$ and $0,108$). Table 5 shows the results of the binary logistic regression models that considered necessity driven entrepreneurs and non-entrepreneurs. It can be seen that the theory of planned behavior variables accounted for 7,0% and 3,8% of the variance of entrepreneurial behavior for 2007 and 2009, respectively (Nagelkerke- $R^2 = 0,070$ and $0,038$).

Tables 4 and 5 also show that for the 2007 sample, all of the independent variables had a significant influence on entrepreneurial behavior when it is driven by opportunity. Interestingly, for that same year, none of the independent variables had a significant effect on necessity driven entrepreneurial behavior. These results would suggest that the theory of planned behavior might be better suited to explain opportunity-driven entrepreneurship than necessity-driven entrepreneurship.

In 2009 the results show a different pattern from that obtained in 2007. Indeed, in 2009, attitude toward entrepreneurship (based on opportunity perception) and perceived behavioral control had significant effects on both opportunity- and necessity-driven entrepreneurial behaviors. This change, with respect to the 2007 results, may be explained by the fact that the 2009 data were collected in the midst of the global crisis. It can be argued that because of the crisis both types of entrepreneurs were

TABLE 4. Binary logistic regression models (opportunity driven entrepreneurial motivation).

Predictor variable	Coefficient	Standard error	Exp(B)
Attitude toward entrepreneurship-opportunities			
- 2007	0,759*	0,318	2,135
- 2009	1,051**	0,220	2,861
Attitude toward entrepreneurship-fear of failure			
- 2007	-0,790*	0,378	0,454
- 2009	-0,079	0,189	0,924
Subjective norm			
- 2007	0,605*	0,280	1,832
- 2009	0,223	0,185	1,250
Perceived behavioral control			
- 2007	2,411*	0,730	11,148
- 2009	1,275**	0,294	3,577
Nagelkerke- R^2			
- 2007	0,163		
- 2009	0,108		

* $p < 0,05$, ** $p < 0,001$

TABLE 5. Binary logistic regression models (necessity driven entrepreneurial motivation).

Predictor variable	Coefficient	Standard error	Exp(B)
Attitude toward entrepreneurship-opportunities			
- 2007	0,524	0,533	1,689
- 2009	0,600*	0,303	1,823
Attitude toward entrepreneurship-fear of failure			
- 2007	-0,573	0,640	0,564
- 2009	0,055	0,277	1,057
Subjective norm			
- 2007	-0,108	0,466	898
- 2009	0,183	0,278	1,201
Perceived behavioral control			
- 2007	1,988	1,045	7,297
- 2009	0,880*	0,391	2,410
Nagelkerke- R^2			
- 2007	0,070		
- 2009	0,038		

* $p < 0,05$, ** $p < 0,001$

more careful when deciding to start their own businesses. The results suggest that the identification of some opportunity and the development of required skills and knowledge became

² The authors are grateful to an anonymous reviewer who suggested us to further the analysis by testing the research model within the contexts of opportunity and necessity driven entrepreneurial behavior.

particularly important before engaging in any entrepreneurial activity, including necessity-driven entrepreneurship.

7. Discussion

The main purpose of the study was to examine the applicability of the theory of planned behavior as a predictor of entrepreneurial behavior within the context of the Global Entrepreneurship Monitor research program in Peru.

In their review of the extant literature on enterprising individuals, Shook et al. (2003) found that most empirical studies had relied on student samples and urged researchers to study actual entrepreneurs. Accordingly, one of the purposes of the study was to test the applicability of the theory of planned behavior with nascent entrepreneurs and in a Latin America country. As part of the GEM Peru project, data were collected through a questionnaire that was applied to a representative sample of the Peruvian adult population. This procedure allowed us to get first hand information from both nascent entrepreneurs and non-entrepreneurs.

Another purpose of the study was to use the theory of planned behavior to predict entrepreneurial behavior as opposed to entrepreneurial intention. Most prior empirical studies have focused on intentions neglecting the study of actual behavior. Venture creation is the actual phenomenon this stream of research should aim at explaining. Further, the linkage between intention and behavior needs to be empirically validated in the entrepreneurship field (Autio et al., 2001; Katz, 1990; Kolvereid, 1996).

The results of the study partially support the theory of planned behavior. Indeed, only attitude toward entrepreneurship (based on opportunities perception) and perceived behavioral control had significant effects on entrepreneurial behavior. Even though subjective norm was significantly correlated with entrepreneurial behavior for both 2007 and 2009, the logistic regression model showed that the influence of subjective norm on behavior became non-significant. These results are somewhat consistent with those found by Krueger et al. (2000) and Liñán and Chen (2009) who did not find signi-

ficant effect of subjective norm on behavioral intention.

There are also similarities and differences between these results and those obtained by Arenius and Minniti (2005). By analyzing GEM data from 28 countries, they found that, across all countries, opportunity perception, fear of failure, knowing other entrepreneurs, and confidence in one's own knowledge, skill and experience, among other variables, had significant effects on nascent entrepreneurship. In the present study, however, the influence of knowing other entrepreneurs was not significant. The influence of fear of failure was significant in 2007 but non-significant in 2009.

The analysis of the determinants of opportunity and necessity driven entrepreneurial behavior suggests that the theory of planned behavior might be better suited to explain opportunity driven entrepreneurship than necessity driven entrepreneurship. This conclusion is supported by the 2007 data. For the 2009 data, attitude toward entrepreneurship (based on opportunity perception) and perceived behavioral control had significant effects on both opportunity- and necessity-driven entrepreneurial behaviors. This result may be explained by the fact that the 2009 data were collected in the midst of the global crisis. It can be argued that in difficult situations both types of entrepreneurs are more careful when deciding to start their own businesses.

The overall models explained about 16,0% and 10,2% of the variance in entrepreneurial behavior in 2007 and 2009, respectively (see Table 3). These percentages, particularly for 2009, are rather low compared to those of prior studies. For example, the theory of planned behavior explained 21% of the variance in entrepreneurial intention in Kolvereid and Isaken (2006), 27% in Gird and Bagraim (2008), 30,3% in Autio et al. (2001), 35% in Krueger et al. (2000), 35% in Souitaris et al. (2007), 45% in Tkachev and Kolvereid (1999), and 55,5% in Liñán and Chen (2009). The low percentages found in the current study may be explained by the fact that prior research used the theory of planned behavior to explain entrepreneurial intention while this study focused on entre-

preneurial behavior. This result would suggest that the theory of planned behavior might be better suited to explain entrepreneurial intention than entrepreneurial behavior. In this line of reasoning, Katz (1990) questioned the intention-behavior link in the field of entrepreneurship while Souitaris et al. (2007) found no significant relationship between intention and nascency (i.e. entrepreneurial behavior). Souitaris et al. (2007) attributed this lack of significance to the time-lag between entrepreneurial intention and behavior.

The noted low percentages might also be explained by a characteristic exhibit by Peruvians, namely, their relatively low level of tolerance for uncertainty (Hofstede and Hofstede, 2005). It may well be that the theory of planned behavior does explain entrepreneurial intention but that it does not explain much of Peruvians actual entrepreneurial behavior because even though they might have the intention to start their own businesses, they do not necessarily end up implementing them. As Hofstede and Hofstede (2005) argue, societies with high levels of uncertainty avoidance tend to look for long-term employment. Further research is certainly needed to better establish the link between the antecedents of the theory of planned behavior, intention and entrepreneurial behavior.

7.1. Limitations of the study

Even though the results of the study tend to support the application of the theory of planned behavior in predicting entrepreneurial behavior, the study has some limitations that should be noted. First, even though the measures used in the study are similar to those used in previous studies, this study relied on a two-item measure for attitude and single-item measures for subjective norm and perceived behavioral control. The use of multiple-item reliable and valid measures is highly recommended (Cone and Foster, 1993). Second, the study focuses only on Peru. It is necessary to conduct similar studies in other countries in Latin America and other regions to have a better assessment of the hypothesized relationships.

7.2. Implications for future research

Researchers who have assessed the theory of planned behavior in the context of entrepreneurship have focused mainly on predicting entrepreneurial intentions and have paid less attention to the prediction of entrepreneurial behavior. The present study aimed at filling this gap and found partial support for the theory of planned behavior. Before reaching any definite conclusion, however, more research is needed to better understand the determinants of entrepreneurial behavior.

The Global Entrepreneurship Monitor research program offers a unique opportunity to test the effectiveness of the theory of planned behavior. The GEM Adult Population Survey gathers rich information from representative samples of more than 50 countries. The GEM program should evaluate the possibility of including some additional items to measure attitude toward entrepreneurship, subjective norm, and perceived behavioral control. In this sense, the GEM program might evaluate the convenience of relying on some measures developed by some other entrepreneurship researchers (e.g., Liñán and Chen, 2009) or developing their own set of valid and reliable measures. The GEM research program offers the possibility of testing the theory of planned behavior and competing theories across cultures using actual entrepreneurs.

To better establish the relationship between the antecedents and behavior, longitudinal studies are needed. The GEM research program might consider doing a follow-up data collection with at least a sub-sample of the respondents of one particular year during the next cycle of data collection.

The GEM research program distinguishes between necessity- and opportunity-based entrepreneurship. A preliminary assessment of the explanatory power of the theory has been performed in this study. The theory seems to be better suited to explain opportunity-driven entrepreneurship. The results also suggest that the global crisis seems to have significantly affected the decision-making process of both

opportunity- and necessity-driven entrepreneurs. They tend to be more cautious when deciding to engage in an entrepreneurial activity. It would be interesting to explore the implications of the global crisis in different contexts and in the coming years.

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