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Discovery of entrepreneurial opportunities: a gender perspective

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Abstract

Purpose – The aim of this paper is twofold. First, it intends to analyze the influence of human capital and social capital on the second of the stages in the process of entrepreneurial creation established by Shane and Venkataraman, the discovery of opportunities for creating a business. Second, it aims to analyze the existence of gender differences both in the discovery of opportunities and in the stock of human and social capital possessed by men and women.

Design/methodology/approach – The authors use data from the Global Entrepreneurship Monitor Spanish Project. From a random sample of 28,888 individuals, which is representative of the whole of the Spanish population between the ages of 18 and 64, the opinion of 1,473 active entrepreneurs has been gained. Also, logistic regressions were used as a statistical method to test the hypotheses proposed.

Findings – The results indicate that individuals possessing a greater stock of human capital, as well as those who are highly involved in broad social networks, discover more chances of business creation. Similarly, this work shows that men discover more business opportunities and possess more human and social capital than women.

Research limitations/implications – The results obtained allow the authors to make a contribution to the literature about the influence that human and social capital exerts on the discovery of entrepreneurial opportunities. Regarding gender, the main contribution of the work is that gender differences exist both in the discovery of opportunities and in the stocks of human and social capital possessed by individuals. The main limitation of the paper is the difficulty of directly measuring variables used and thus the need to use "proxy" variables.

Practical implications – The results of the paper can help politicians and educators to enhance endeavours to increase attention to human and social factors and gender differences, in order to develop the second of the stages in the process of entrepreneurial creation, the discovery of opportunities for creating a business.

Originality/value – In line with the findings and research implications, the paper provides additional proofs of why gender differences exist with regard to the entrepreneurial process, in part related to differences in human and social capital. However, other factors apart from the different stocks of human and social capital could explain this phenomenon, so a new line of research is necessary.

Keywords Entrepreneurialism, Human capital, Social capital, Gender, Business formation, Spain

Paper type Research paper

1. Introduction

The discovery of entrepreneurial opportunities appears as a basic aspect in the literature on entrepreneurship in recent years (Shane and Venkataraman, 2000; Gaglio and Katz, 2001), and has become a key aspect of research in this field (DeTienne and Chandler, 2007).

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Previous works on the topic consider that discovering entrepreneurial opportunities constitutes an important entrepreneurial skill (Ardichvili *et al.*, 2003), a source of competitive advantage (Alvarez and Busenitz, 2001) and an important content area in entrepreneurship education (Kourilsky, 1995; DeTienne and Chandler, 2004).

This is the reason why there exists a current of research in the field of entrepreneurship that claims that the most important thing in this area is not identifying people who wish to be entrepreneurs but rather seeking the link between them and valuable entrepreneurial opportunities (Venkataraman, 1997; Shane and Venkataraman, 2000). Thus, identifying and choosing the right opportunities for creating new businesses is almost the most important ability for a successful entrepreneur. In this way, the explanation for the discovery and its exploitation is a fundamental part of the entrepreneurial process, and research must provide answers to the following questions (Shane and Venkataraman, 2000): why, when and how do opportunities arise for creating goods and services? Why, when and how do some people and not others discover and take advantage of such opportunities? Why, when and how are different types of action used to exploit entrepreneurial opportunities?

However, despite the stress made in the literature on the early phases of the entrepreneurial creation process (Gartner, 1988; Shane and Venkataraman, 2000), it is a surprising fact that among publications in the field of entrepreneurship there is a prevalence of those studies based on already-existing firms (Davidsson and Wiklund, 2001) and very few studies including the early phases of the entrepreneurial process (Davidsson and Honig, 2003).

In this way, this work aims to analyze what factors influence on the discovery of entrepreneurial opportunities by centring on human capital, social capital and gender as determinants since no works has found in previous literature that analyzed the three variables together. We are motivated to further explore these relationships by our belief that a more complete understanding of the interplay between human capital, social capital and gender is key to improving the discovery of entrepreneurial opportunities literature. In that sense, the literature stresses a positive relationship between human capital and discovering opportunities (Davidsson and Honig, 2003; Ucbasaran *et al.*, 2003). This, along with the works analyzing gender differences on human capital (Kalleberg and Leicht, 1991; Fischer *et al.*, 1993; Srinivasan *et al.*, 1994; Chaganti and Parasuraman, 1996), suggests that differences in human capital could partly account for gender differences in opportunity-identification processes (DeTienne and Chandler, 2007). That is why the first aim of this work is to analyze whether human capital impinges on discovery of opportunities, also bearing in mind in this case gender-based differences.

On the other hand, this work posits as its second goal to make progress in the study of the influence of social capital on the process of entrepreneurship by considering its effect on discovering entrepreneurial opportunities. Although it has been recognised that social capital is important for analyzing business creation (Ostgaard and Bierley, 1996; Baron and Markman, 2003; Weslund and Bolton, 2003, p. 77; Liao and Welsch, 2005; DeCarolis and Saparito, 2006), the attention so far shown by the literature has been scant and partial, since most works have centred on analyzing the relationship between social capital and the process of business creation considered globally and there has been no specific analysis of the effects that social capital may exert on the identification of entrepreneurial opportunities. Moreover, we want to analyze if gender differences exists with regard to the stock of social capital that men and women possess.

Finally, in spite of the existence of an emerging research field centring on the study of women entrepreneurs (Baker *et al.*, 1997), only one work has been found which analyses the role of women in the discovery of entrepreneurial opportunities (DeTienne and Chandler, 2007). Going more deeply into studying gender differences in identifying entrepreneurial opportunities in order to contribute to the scarce amount of existing literature constitutes the third purpose of this work.

The rest of the article is organised as described below. In Section 2, the theoretical frame of analysis is established with hypotheses founded on a review of the available empirical evidence. Section 3 describes and justifies the research design. Section 4 presents the findings. Finally, in Section 5, the findings are discussed and the main conclusions put forward, as well as the work's limitations and future research lines.

2. Theoretical background and hypotheses

2.1 Discovery of entrepreneurial opportunities

In general, terms entrepreneurial opportunities are situations in which new products, services, materials and organisational methods can be launched onto the market to create greater value (Casson, 1982). Opportunities may arise as a consequence of an increase in available information (Shumpeterian opportunities) or through exploiting market inefficiencies stemming from information asymmetries and which lead to only a small group of the population having access to it (Kirzner, 1973, 1985, 1997). Opportunities arising from information asymmetries – known as Kiznerian opportunities – occur because each member of society depending on the information he/she may possess, makes assumptions and on the basis of them makes varying estimates as to the relative value involved in different uses of resources and their profit-making potential (Kirzner, 1997). These assumptions are influenced by a large variety of factors (superior intuition, private information and luck) and therefore, the decisions they give rise to will be different ones. Some individuals will adopt mistaken decisions leading to inefficiencies (dearth or excess) in assigning resources. Such inefficiencies will represent opportunities for those individuals who are alert for these errors and able to identify them (Eckhardt and Shane, 2003).

An individual can gain profit, in addition to that from the existence of an entrepreneurial opportunity, from being able to recognise that such an opportunity exists and is worth something (Shane and Venkataraman, 2000, p. 221). Ability to identify opportunities is a cognitive task allowing some individuals but not others to discover entrepreneurial opportunities and it relies on the individual having the necessary prior information to be able to identify the opportunity and the individuals' cognitive properties (Shane and Venkataraman, 2000, p. 222).

2.2 Human capital and the discovery of opportunities

The theory of human capital centres upon the study of cognitive factors which measure the knowledge and necessary skills to start up a new business (Schultz, 1959; Becker, 1964; Mincer, 1974). This theory maintains that knowledge gives individuals greater cognitive capacity, making them more productive and efficient (Schultz, 1959; Becker, 1964; Mincer, 1974). In this way, individuals with a greater quality of human capital will be better able to identify entrepreneurial opportunities (Davidsson and Honig, 2003, p. 305).

Formal education is one component of human capital which makes accumulation of knowledge possible by providing entrepreneurs with useful skills for business creation. Various empirical research works have analysed the relationship between education

and creation and entrepreneurial success, suggesting that the effects of education on the likelihood of being an entrepreneur or being successful are usually of a non-linear type (Evans and Leighton, 1989; Bellu *et al.*, 1990; Davidsson, 1995; Honig, 1996; Gimeno *et al.*, 1997; Reynolds, 1997). Entrepreneurs have individual assets that help them recognise new opportunities and assemble resources for new ventures (Alvarez and Busenitz, 2001; Ruzzier *et al.*, 2007). Human capital is not only made up of knowledge provided by formal education but it also includes knowledge acquired through experience and practical learning. Thus, a broad experience of working in a specific market as well as specifically directed vocational experience may, in theory, increase human capital (Becker, 1964). Empirical evidence shows that ability to discover entrepreneurial opportunities has a positive relationship with human capital through different variables such as education (Davidsson and Honig, 2003), work experience, both in general (Davidsson and Honig, 2003) and in a particular industry (Shane, 2000; DeTienne and Chandler, 2007), entrepreneurial experience (Davidsson and Honig, 2003; Ucbasaran *et al.*, 2003; DeTienne and Chandler, 2007), previous knowledge (Shane, 2000) and previous knowledge of customers' problems (Sheperd and DeTienne, 2004).

It is not simply an individual's real knowledge (level and type of studies, for example) that is a determinant for discovering entrepreneurial opportunities; rather, it is the perception or confidence the latter has of knowledge and abilities that he/she has that is key. In this sense, self-efficacy, as understood in terms of judgement which people make of whether they possess the skills to perform a particular task, as well as the belief that they are able to make use of these abilities to achieve the proposed result (Bandura, 1989, 1997), has been identified as one of the main cognitive factors affecting the entrepreneurial spirit (Scott and Twomey, 1988; Chen *et al.*, 1998; DeNoble *et al.*, 1999; Segal *et al.*, 2002). To the extent that the individual believes that he/she has these skills, he/she can consider starting up an initiative (Krueger *et al.*, 2000; Wilson *et al.*, 2007b). Krueger *et al.* (2000) maintain that identifying opportunities depends upon individual perception that the situation is controllable and positive, since perceiving self-efficacy constitutes a substantial antecedent in the recognition of opportunities. Individuals' intentions to start new business are a function of the extent to which they perceive that it is both feasible and desirable for them to do so (Kolvereid, 1996; Krueger and Brazeal, 1994; Kundu and Rani, 2007). However, although there are some previous research works which relate self-efficacy to entrepreneurial intentions (Scott and Twomey, 1988; Chen *et al.*, 1998; DeNoble *et al.*, 1999; Segal *et al.*, 2002), no work has been found in the literature which analyses the relationship between self-efficacy and discovering opportunities.

From all the above, it is possible to formulate the following hypothesis:

H1. Human capital (formal education and self-efficacy) is positively related to discovering opportunities for creating business.

2.3 Social capital and the discovery of opportunities

In recent years from different viewpoints attention has been drawn to the influence exerted by certain assets of a social nature – such as networks of relationships, reciprocity norms, values, cooperation or trust – on economic activities (Fukuyama, 1995; Barro, 1996; Putnam, 2000; Baumol, 2002; Guiso *et al.*, 2004; North, 2005). Social activities, springing from stable relationships maintained by individuals, groups and organisations in society, are normally identified with the concept of social capital

(Bourdieu, 1986; Coleman, 1988, 1990; Putnam *et al.*, 1993; Putnam, 2000; Ruzzier and Antoncic, 2007). The use of the term "social capital" has become generalised (Casson and Della Giusta, 2007) and is used to describe in a unified way all assets which facilitate social relationships and economic exchanges (Grootaert and van Bastelaer, 2002).

The concept of social capital refers to social networks and reciprocity norms associated with them (Putnam, 2000, p. 9). This form of capital springs from stable relationships maintained by individuals, groups and organisations in society. Just the same as physical or human capital, it is a productive resource which facilitates cooperation by economic agents in pursuing common objectives. Social capital is inherent in the community spirit (Danchev, 2006). Whereas physical capital is reflected in the provision of machinery and installations and human capital is embodied in the skills and knowledge acquired by an individual, social capital is embodied in the relations among persons (Coleman, 1990). Membership in community organisations, political groups and associations are predicted to amplify to returns to human capital (Honig, 1998, p. 377). Social capital is accumulated by means of an investment process in which valuable resources are used, particularly time, in developing and reinforcing social relationships (Lin, 2001). The stock of social capital is made of the sunk costs of time and efforts in social activities (Westlund, 2006). Investment in social capital generates economic performance which improves social relationships, facilitates access to information, stimulates cooperation and generates mutual trust.

Social capital is an asset which can be created and exploited both at an individual and collective level (Bowles and Gintis, 2002). Structural context influences an individual's perceptions, actions and experiences (Yang *et al.*, 2009). In a particular social context, individuals acquire social capital through deliberate actions and can take advantage of it to obtain economic returns. The ability to do so depends, nevertheless, on the nature of the social obligations, connections and networks that they have at their disposal (Bourdieu, 1986). The extension of social capital at a collective level among many individuals has important social implications. Social capital built up over a geographical area may provide benefits for the whole population. In environments with high social capital levels where there is a proliferation of social networks facilitating relationships between individuals, the likelihood of repeated interaction between agents rises. This atmosphere is fertile soil for consolidating shared values, strengthening social norms of trust, reciprocity and cooperation. The available information is of higher quality and is spread quickly, thus increasing the opportunity cost of opportunistic behaviour. In this way, agents' behaviour becomes more foreseeable and uncertainty falls. On the contrary, in environments with low levels of social capital, individuals are distrustful, relationships are based on rigid contracts, the exchange of information is limited and barriers are raised to hinder access to resources and the exploitation of opportunities. Thus, in the same way that an increase in the stock of physical capital reduces the average production cost, an increase of social capital, by improving relationships between individuals, reduces the average cost of economic transactions (Zak and Knack, 2001).

An increasing number of works have drawn attention to the influence exerted by the social environment of the potential entrepreneur on discovering opportunities. It has been pointed out that the characteristics of the nearest environment – of which relatives, friends and workmates form a part-impinge on individual capacity to identify opportunities (Hills *et al.*, 1997; De Koning, 1999). In the initial stages of new venture creation, entrepreneurs have not developed important ties outside the firm yet because they

are unknown to other market actors. Therefore, they have to rely on friendship ties (Bratkovic *et al.*, 2009). Moreover, conventions, trade fairs and professional associations – of consumers, suppliers or investors – with interests in the same industry are social environments which make recognising opportunities easier (Ozgen and Baron, 2007). Social networks, in general, play a fundamental role in the discovery of opportunities since they facilitate the spread of information among their members (Singh, 2000) and complement the potential entrepreneur's cognitive abilities (De Koning, 1999).

Environments where there is a large stock of social capital are characterised by having developed several social exchange networks. The individuals who do well in these places have greater opportunities to obtain information and define new businesses via any contacts they might have with other network members, who may make available complementary know-how and resources (Larson, 1991). The greater the stock of accumulated social capital in a particular environment – the more extensive and denser will be the networks of social links among individuals – the higher the likelihood of opportunities being found for business creation (Hills *et al.*, 1997). On the basis of these arguments, the following hypothesis can be formulated:

H2. Social capital is positively related to the discovery of opportunities for creating businesses.

2.4 Gender and the discovery of opportunities

The social feminism theory (Fischer *et al.*, 1993; Carter and Williams, 2003; Johnsen and McMahon, 2005) suggests that men and women are different in the sense of having different learning experiences. Men and women have "ways of thinking and reasoning which are effective, but different" (Johnsen and McMahon, 2005, p. 17). Therefore, women seek a greater balance compared to men between work and family roles and are always aware of limitations of time and space when creating new firms (Brush, 1992; Carter and Williams, 2003).

Although there are a lot of papers in recent literature on different aspects related to discovering opportunities, there are few works which explore the relationship between gender and the discovery of opportunities. For example, DeTienne and Chandler (2007) analyze gender differences in identifying entrepreneurial opportunities by using two samples of individuals (95 grade students and 189 entrepreneurs belonging to high-tech industries) and conclude that men and women use their unique stocks of human capital to identify opportunities and that they use fundamentally different processes of opportunity identification. Previously, Chandler *et al.* (2005) had proposed four processes for identifying opportunities (learn/reply, learn/innovate, learn/acquire and innovate/educate) which allowed them to show that differences in human capital are related to choosing and applying different processes for the identification of opportunities. On the other hand, papers focused on the existence of gender differences in the entrepreneurial process show that men are more active in entrepreneurship than women (Chen *et al.*, 1998; Kourilsky and Walstad, 1998; Wilson *et al.*, 2007a). For instance, 2004 Global Entrepreneurship Monitor (GEM) study reported that:

- men are more active in entrepreneurship than women in each country surveyed; and
- in high-income countries, men are 33 percent more likely than women to be active entrepreneurs (Minniti *et al.*, 2005).

Similar results were obtained by Reynolds *et al.* (2002) showing that in the USA, adult men are twice as likely as women to be in the process of starting a new business.

Thus, based upon the theory of social feminism and bearing in mind the results obtained in previous research works, the following hypothesis can be formulated:

H3. Gender differences exist regarding the discovery of opportunities for creating business such that men discover more entrepreneurial opportunities than women.

On the other hand, previous research also suggests that men and women have different qualities of human capital when it comes to creating a new business (Srinivasan *et al.*, 1994; Chaganti and Parasuraman, 1996; Boden and Nucci, 2000). For example, in a study carried out with a sample of 508 entrepreneurs (40 women), Fischer *et al.* (1993) indicate that when starting up a new firm, men have greater levels of experience in terms of managing human resources and have greater previous experience in the industry and greater previous entrepreneurial experience. Thus, previous studies have proved that, among entrepreneurs, men have more years of experience in the industry (Cromie and Birley, 1991; Kalleberg and Leicht, 1991; Chaganti and Parasuraman, 1996; Carter and Williams, 2003). Furthermore, some studies show that when starting up a firm, men have more experience in managing and organising than women (Srinivasan *et al.*, 1994; Boden and Nucci, 2000). On the other hand, different studies suggest that women professed lower levels of confidence and preparedness in their ability to succeed as entrepreneurs, that is, lower entrepreneurial self-efficacy than men (Kourilsky and Walstad, 1998; Gatewood *et al.*, 2002; Chowdhury and Endres, 2005; Wilson *et al.*, 2007a), this pattern being globally among adult women (GEM). As DeTienne and Chandler (2007) suggest, these differences allow men and women to develop a unique human capital that has its effect on the discovery of opportunities. In the words of Venkataraman (1997, p. 123), "Having useful knowledge is different between individuals and that difference is important. This variable impinges on the search for and the decision to exploit an opportunity". In this way, there exists evidence in the literature which highlights the gender differences as far as how much human capital individuals possess, and this enables the following hypothesis to be enunciated:

H4. There exist gender differences with regard to human capital such that men have more human capital than women.

Finally, as has already been commented on, there is evidence in the literature which highlights the influence exerted by social networks on the discovery of opportunities (Hills *et al.*, 1997; Davidsson and Honig, 2003). What is more, Greene (2000) analyses the relationships between social and human capital and female self-employment and concludes that both types of capital are determining factors in women's propensity to be entrepreneurs. In this sense, the works on the influence of formal and informal networks are important (Aldrich, 1999; Aldrich and Martinez, 2001), as well as studies centring on the importance of role models (Walstad and Kourilsky, 1998; Wagner and Sternberg, 2004) on entrepreneurial decisions. Langowitz *et al.* (2006) show the importance of social networks and role models for women involved in different stages of the entrepreneurial model. Focusing on papers which analyze the existence of gender differences, many studies suggest that women may have less or different access to social capital than men (Carter, 2000; Buttner, 2001; Greene *et al.*, 2001; Menzies *et al.*, 2004; Moore, 2004).

For instance, DeTienne and Chandler (2007) based on a report made by the National Foundation for Women Business Owners (2001) maintain that women are less likely to have a mentor and more likely to consult with a wide-ranging external network when starting up business. All these ideas make it possible to formulate the following hypothesis:

H5. There are gender differences with regard to social capital such that men have more social capital than women.

3. Methodology

3.1 Data collection

The above hypotheses were tested using the GEM 2009 Spain Report, which includes information on all Spanish autonomous communities. This report is prepared from three information sources: a survey from a representative sample of the Spanish working population; a survey of experts in different fields, such as financing, governmental policies or education and other secondary sources, such as the World Bank, the International Monetary Fund or the BBVA Foundation.

More specifically, for this work information was used from the first of these sources, that is, the survey taken from the working population of Spain (Adult Population Survey). This survey was carried out over the telephone, between April and June, from a random sample of 28,888 individuals, which is representative of the whole of the Spanish population between the ages of 18 and 64 (sample error $\pm$ 0.58 percent, level of confidence 95 percent). Of these 28,888 individuals, 14,663 are men and 14,225 women. From this sample, the opinion of 1,473 active entrepreneurs (62.6 percent are men and 37.4 percent women) has been gained, thus guaranteeing that the estimates and cross data which may be made from this information will have a sample error equal to or less than ± 5 percent.

3.2 Description of model and variables

Based on the theoretical model from the previous section, the empirical model used for analyzing the factors determining the discovery of opportunities has been a logistic regression with the forward stepwise selection method, which has the following structure:

$$DISCOVERY\,OPPORTUNITY = \beta_0 + \beta_1\,HUMAN\,CAPITAL + \beta_2\,SOCIAL\;\;CAPITAL + \beta_3\,GENDER + \beta_4\,AGE + \varepsilon$$

On the one hand, discovering entrepreneurial opportunities (OPPORTUNITY) has been measured from the replies of the population group to the question about whether they had thought of starting up a business, either by themselves or with others, in the following three years. This question not only identifies individuals who have discovered a particular opportunity, it also reflects a greater commitment to the opportunity discovered, since he/she states that he/she is willing to take advantage of it in the next three years. The replies provided by individuals give rise to a dummy variable taking value 1 when individuals state that they are willing to create a firm during that period of time and 0 otherwise[1].

On the other hand, the independent variables through which we approximate the determinant factors in the discovery of opportunities are described below:

- *Human capital*. In order to estimate the human capital possessed by individuals, two variables have been used, each of which reflects a component of human capital: formal education and self-efficacy. On the one hand, with the aim of estimating individuals' education level (EDUCATION), the level of studies of the population has been used, divided into five large categories: no formal education, primary/EGB studies, secondary studies, university and post-graduate studies. On the other hand, self-efficacy (SELFEFFICACY) has been measured from individual replies to the question on whether they considered themselves to have the necessary skills to start up an entrepreneurial activity.
- *Social capital*. As a measurement of social capital, two variables have also been used, both deriving from the population's answers to the following questions. The first one is, whether they know anyone who has set up any business initiative in the previous two years (LINK). The second one is whether they have acted in the previous three years as informal investors or business angels, that is, whether they have provided their own funds to finance the start up of other people's entrepreneurial initiatives (INVESTOR). Both if they directly started up an entrepreneurial initiative and if they provided funds for third-party directed entrepreneurial initiatives, the capital stock would be greater, since in both cases they develop a network of social links.
- *Gender*. In this case, a dummy variable has been used taking the value 1 in the case of men and 2 in the case of women (GENDER).

Finally, we controlled for the age effect of the Spanish working population using the AGE variable. The descriptive statistics and correlations between variables are given in Tables I and II, respectively.

So, the model used can be expressed as follows:

$$DISCOVERY\,OPPORTUNITY = \beta_0 + \beta_1\,EDUCATION + \beta_2\,SELFEFFICACY + \beta_3\,LINK + \beta_4\,INVESTOR + \beta_5\,GENDER + \beta_6\,AGE + \varepsilon$$

4. Results

The results obtained with regard to the analysis of the factors determining the discovery of entrepreneurial opportunities are shown in Table III, using the SPSS statistical program.

First, it must be stressed that the parameters for both EDUCATION and SELFEFFICACY are significant and, as expected, positive. Since these variables

Variable	Mean	Min.	Max.	*n*
OPPORTUNITY	0.05	0	1	28,570
EDUCATION	1.97	0	4	28,649
SELFEFFICACY	0.51	0	1	28,004
LINK	0.33	0	1	28,751
INVESTOR	0.03	0	1	28,882
GENDER	1.49	1	2	28,888
AGE	39.98	18	64	28,865

Table I. Descriptive statistics

	EDUCATION	SELFEFFICACY	LINK	INVESTOR	GENDER	AGE
EDUCATION	1.0000					
SELFEFFICACY	0.161*	1.0000				
LINK	0.122*	0.219*	1.0000			
INVESTOR	0.037*	0.124*	0.143*	1.0000		
GENDER	−0.048*	−0.121*	−0.093*	−0.040*	1.0000	
AGE	−0.187*	−0.030*	−0.166*	0.000	0.020*	1.0000

Table II.
Correlations

Notes: Significant at: *99 percent; this table shows the phi correlation coefficient for all the correlations except for the AGE-EDUCATION correlation; in this case, we calculate the Spearman rank

	Discovery of entrepreneurial opportunities	
	Coefficient	Wald
Human capital		
EDUCATION	0.001***	7.609
SELFEFFICACY	1.584***	436.461
Social capital		
LINK	0.777***	184.994
INVESTOR	1.170***	157.142
GENDER	−0.218***	15.046
AGE	−0.046***	305.321
R^2 Cox and Snell	0.060	
R^2 Nagelkerke	0.171	
χ^2	1,687.01***	
Global percent of correct predictions	94.4	

Table III.
Factors determining the discovery of opportunities (logistic regression)

Note: Significance at: *90, **95 and ***99 percent, respectively

approximate the individual's possession of human capital, the *H1* is supported, that is, the higher the population's human capital, the more likely the discovery of entrepreneurial opportunities. In other words, the greater the individuals' educational level and the better their perception of having the necessary knowledge and skills to develop entrepreneurial activities, the greater will be the likelihood that these individuals will start up some form of entrepreneurial initiative, since they will be better able to identify the opportunities existing in the market (Davidsson and Honig, 2003). Therefore, it can be stated, as was established in the first of the hypotheses presented that human capital is positively related to the discovery of business opportunities.

Second, it can be observed that the coefficients relative to the LINK and INVESTOR variables which approximate, in this case, the individual's possession of social capital, are also positive and statistically significant. Therefore, these results support the *H2*, that is, that social capital is positively related to the discovery of entrepreneurial opportunities. Having entrepreneurs in your social circle and having taken part in financing business initiatives implies being present in a social network or environment which facilitates the spread of information among its members (Singh, 2000), reinforces cooperation and trust, and diminishes the likelihood of opportunistic behaviour. All of this facilitates the recognition of entrepreneurial opportunities (Hills *et al.*, 1997).

Third, the GENDER variable presents a negative, significant sign. Therefore, this supports the idea established in *H3* of the existence of gender differences in the discovery of opportunities. More specifically, the negative sign of this variable shows that men discover more entrepreneurial opportunities than women. This result constitutes one of the contributions of this work to the existing literature, since although it has been pointed out that men and women use different processes for discovering opportunities, previous works do not reach a conclusion as to whether such differences with regard to the identification processes imply greater discovery of opportunities by men or by women (Chandler *et al.*, 2005; DeTienne and Chandler, 2007).

Finally, the AGE variable is negative and significant, which indicates that younger people are more likely to find a larger number of entrepreneurial opportunities.

Regarding the indicators of the model's goodness of fit, the difference between the maximum verisimilitude function computed at the beginning and the end (final-2LL), which represents a fall in the estimation error once all the variables are introduced, follows a χ^2 distribution. This is used to test the null hypothesis that the improvement has been statistically equal to zero. The value of χ^2 equals 1687.01 allows the null hypothesis to be rejected. Thus, it can be concluded that the global explanatory value of the model is good and that the chosen set of independent variables makes an adequate discrimination between those Spaniards who unearth new opportunities and those who do not do so.

Moreover, measures analogous to the coefficient of linear regression determination have been proposed. Specifically, the two pseudo-R^2 measures generally used, but not short of critics, are the R^2 of Cox and Snell and Nagelkerke's R^2 coefficients. These coefficients achieved values of 6 and 17.1 percent which indicate that the logistic regression models explain a fairly limited percentage of the likelihood of seeing good opportunities. This is due to the fact that the likelihood of individual adult noticing good opportunities depends upon other factors, as well as those considered.

On the other hand, in order to test *H4* and *H5*, which argue that there are gender differences in the case of possession of human and social capital, we run different tests, the aim being to analyze any significant statistical differences between men and women regarding the development of these two types of capital. On the one hand, in order to analyze whether a dependence relationship exists between gender and the level of education (first component of human capital), we created a contingency table and use the χ^2 independence test. On the other hand, we used test of means (independent samples) to analyze gender differences with regard to self-efficacy (the other component of human capital) and social capital. The results are shown in Tables IV-VI, respectively.

Level of education (%)	Gender	
	Men	Women
No formal education	8.30	11.10
Primary/EGB studies	28.50	30.30
Secondary studies	16.80	15.50
University	44.90	41.90
Postgraduate	1.5	1.2
χ^2	90.801	
Sig.	0.000	

Table IV.
χ^2 independence test (gender and education)

First, with regard to the relationship between gender and formal education, we can observe in Table IV that while in the first two levels of education (no formal education and primary/EGB studies) the percentage of women is higher that the men one, this trend is reversed in the higher levels of education. Moreover, χ^2 test shows that a relationship exists between these two variables. Therefore, we can conclude that men have a higher level of education than women.

On the other hand, Table V shows that 57 percent of men consider they have the necessary skills to start up an entrepreneurial activity while only 45 percent of women have this perception, being this difference significant.

So, with regard to human capital, we can conclude that the male population presents, on the average:

- a higher level of education; and
- greater perception of having the necessary skills and knowledge to carryout entrepreneurial activities than the female population.

These differences are statistically significant. Thus, these results support *H4*, that is, that there are gender differences with regard to the possession and/or development of human capital, in this case, in favor of men.

Regarding social capital, it can be seen in Table VI that the trend is identical to that of human capital. In this manner, as an average, a greater proportion of men:

- know somebody who has started up an entrepreneurial initiative in the last two years; and
- have acted in the previous three years as an informal investor or business angel.

Consequently, it can be concluded that the male population has greater presence in entrepreneurial social networks, which enable them to build up, to a greater extent than in the case of women, the necessary social capital to be able to discover entrepreneurial opportunities. These results clearly support *H5*, which established gender differences in the possession and/or development of social capital. Obviously, we cannot conclude

Table V.
Test of means (human capital)

SELFEFFICACY mean (GÉNDER = 1) $n = 14{,}242$	SELFEFFICACY mean (GÉNDER = 2) $n = 13{,}763$	Mann-Whitney test, independent samples Mann-Whitney	Sig.
0.57	0.45	8.420×10^{-7}	0.000

Table VI.
Test of means (social capital)

		Mann-Whitney test, independent samples Mann-Whitney	Sig.
LINK mean (GENDER = 1) $n = 14{,}596$ 0.37	*LINK mean (GENDER = 2)* $n = 14{,}155$ 0.28	9.253×10^{-7}	0.000
INVERSTOR mean (GENDER = 1) $n = 14{,}660$ 0.04	*INVERSTOR mean (GENDER = 2)* $n = 14{,}221$ 0.02	1.009×10^{-8}	0.000

from this finding that differences both in human and social capital are caused exclusively by gender because we do not control for other related effects, but it is a clear possibility.

The different amounts of both human and social capital that men and women show (in favor of men) could explain the result for *H3,* that is, why men discover more entrepreneurial opportunities than women. Trying to throw more light on this phenomenon, the model has been run again for separate samples, men and women. The results are shown in Tables VII and VIII, respectively.

In general, terms, the results are similar to the Table III ones. In this way, we can observe that those individuals (both men and women) who:

- consider themselves to have the necessary knowledge and skills to start up an entrepreneurial activity;
- know anyone who has set up any business initiative in the previous years; and
- have acted in the previous years as informal investors or business angels discover more entrepreneurial opportunities.

	Discovery of entrepreneurial opportunities		
	Coefficient		Wald
Human capital			
EDUCATION	0.001***		13.832
SELFEFFICACY	1.501***		220.155
Social capital			
LINK	0.741***		99.890
INVESTOR	1.301***		134.248
AGE	−0.045***		175.818
R^2 Cox and Snell		0.065	
R^2 Nagelkerke		0.167	
χ^2		935.48***	
Global percent of correct predictions		93.3	

Note: Significance at: *90, **95 and ***99 percent, respectively

Table VII.
Factors determining the discovery of opportunities (men sample)

	Discovery of entrepreneurial opportunities		
	Coefficient		Wald
Human capital			
EDUCATION	0.001		0.187
SELFEFFICACY	1.698***		220.073
Social capital			
LINK	0.821***		83.995
INVESTOR	0.870***		25.173
AGE	−0.049***		132.440
R^2 Cox and Snell		0.050	
R^2 Nagelkerke		0.166	
χ^2		694.27***	
Global percent of correct predictions		95.6	

Note: Significance at: *90, **95 and ***99 percent, respectively

Table VIII.
Factors determining the discovery of opportunities (women sample)

The only difference between men and women is in the EDUCATION variable. While the greater the men' educational level, the greater the likelihood of discovering some form of entrepreneurial initiative, in the case of women this variable has no effect.

Therefore, we can conclude that other factors apart from the different stocks of human and social capital could explain why women discover fewer opportunities than men do.

5. Discussion and conclusions

The analysis performed allows the confirmation of the *H1* which maintains the influence exerted by human capital on the discovery of opportunities, chiming with previous research (Shane, 2000; Davidsson and Honig, 2003; Ucbasaran Ucbasaran *et al.*, 2003; Sheperd and DeTienne, 2004; DeTienne and Chandler, 2007). The results obtained confirm the idea that formal education makes for the buildup of knowledge, thus giving entrepreneurs useful skills for business creation. Similarly, the results enable it to be pointed out that not only is the formal knowledge possessed by an individual determining for the discovery of entrepreneurial opportunities, but also the perception held by the latter of the skills and knowledge he/she possesses is a key factor. This idea was also stressed in previous works (Krueger *et al.*, 2000; Wilson *et al.*, 2007b).

Regarding the *H2*, the results show that there is a positive, significant relationship between the social networks the individuals are part of and the percentage of the population that discovers opportunities for business creation. This relationship has been previously studied by using different measures and on other samples (De Koning, 1999; Singh, 2000; Davidsson and Honig, 2003; Bøllingtoft and Ulhøi, 2005; Ozgen and Baron, 2007; Bhagavatula *et al.*, 2010). The results obtained coincide and confirm the idea that individuals integrated in dense social networks follow norms of reciprocity, are more willing to cooperate and have a higher degree of trust. This means that they have easy access to large amounts of information and can discover new entrepreneurial opportunities.

Finally, the results allow us to confirm that gender differences exist both in the discovery of opportunities and in the stocks of human and social capital possessed by individuals. Regarding the differences between men and women as far as the process for identifying entrepreneurial opportunities is concerned, the results enable us to conclude that men discover more entrepreneurial opportunities than women. This result is one of the contributions of this work to the existing literature, since although previous works exist pointing out that men and women use different processes for discovering opportunities, these works do not reach a conclusion as to whether such differences in identification processes imply greater discovery of opportunities by men or women (Chandler *et al.*, 2005; DeTienne and Chandler, 2007).

Referring to gender differences in the stock of human capital, the results show that the male population analysed shows a higher level of training and greater perception of the skills and knowledge they possess which are needed to carry out entrepreneurial activities, when compared to the female population, with these differences being statistically significant. This result matches previous works which argue that men have more previous experience (Cromie and Birley, 1991; Kalleberg and Leicht, 1991; Fischer *et al.*, 1993; Srinivasan *et al.*, 1994; Chaganti and Parasuraman, 1996; Boden and Nucci, 2000; Carter and Williams, 2003).

Finally, with regard to differences between men and women in the amount of social capital they possess the results point to a greater proportion of men knowing someone

who has started up a new entrepreneurial initiative in the previous two years and/or has acted as informal investor or business angel in the last three years. Therefore, in this case the conclusion can be drawn that the male population is more present in entrepreneurial social circles, which enables him to develop to a greater extent than women the necessary social capital for discovering new entrepreneurial opportunities. This result constitutes another of the work's contributions since, although previous works exist which analyze the relationships between social and human capital and female self-employment, and reach the conclusion that both types of capital are determinants of women's propensity to be entrepreneurial (Greene, 2000) and studies which go into more depth on the importance of role models (Walstad and Kourilsky, 1998; Wagner and Sternberg, 2004; Langowitz *et al.*, 2006), on entrepreneurial decisions, no work has been found that argues that social capital provision is higher in men than in women.

As a complementary analysis, we try to show if the different amounts of human and social capital that men and women have could explain the gender differences in the discovery of entrepreneurial opportunities. The results indicate that apart from the different stocks of human and social capital there could be other factors explaining why men discover more entrepreneurial opportunities, so a new line of research on this topic appears.

As conclusion, the results obtained in this study can have beneficial effects on individuals that want to become entrepreneurs. Also, they can help politicians and educators to enhance endeavours to increase attention to human and social factors and gender differences in order to develop the second of the stages in the process of entrepreneurial creation, that is the discovery of opportunities for creating a business.

Among the limitations of the present work is the difficulty of directly measuring variables used and thus the need to use "proxy" variables. This could be corrected by designing a purpose-built questionnaire in which a wider diversity of items related to these variables was included. However, this would involve a loss of data on the number of individuals taking part in the research, so a previous evaluation of the potential advantages of making this decision would be called for.

Finally, among possible future research projects, it would be of interest to analyze more thoroughly the gender differences found. In this sense, the relationship between gender and discovery of opportunities should more thoroughly analysed by trying to justify why women discover fewer opportunities. As mentioned previously, this paper shows that gender differences are not only based upon the different stocks of human and social capital that men and women show, so a deeper analysis is needed.

Note

1. The exact question registered in the survey is the following: "Are you thinking of starting up a new business, either by yourself or with others, in the next three years, including any form of self-employment?"

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Further reading

Gomezelj Omerzel, D. and Antonic, B. (2008), "Critical entrepreneur knowledge dimensions for the SME performance", *Industrial Management & Data Systems*, Vol. 108, pp. 1182-99.

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