

COGNITIVE ASPECTS OF POTENTIAL ENTREPRENEURS IN SOUTHERN AND  
NORTHERN EUROPE: AN ANALYSIS USING GEM-DATA

*ASPECTOS COGNITIVOS DE LOS EMPRESARIOS POTENCIALES EN EL SUR Y EL  
NORTE DE EUROPA: UN ANÁLISIS CON DATOS DEL GEM*

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ABSTRACT

The entrepreneurial function has gained great relevance to explain the development process. From an individual's cognitive perspective, entrepreneurial intentions are the most relevant elements leading to starting up a new venture. Therefore, the main objective of this paper is analysing if different perceptions affect entrepreneurial intentions and examining the possible differences between potential entrepreneurs of two European areas: the Southern countries (Spain, Italy, Greece and Portugal) and the Scandinavian countries (Finland, Sweden and Denmark). The empirical analysis, using logistic regression with Global Entrepreneurship Monitor data, shows that personal, opportunity and socio-cultural perceptions do help explaining entrepreneurial intention. The role of cultural and institutional differences is considered in the conclusions.

*Keywords:* New Firms; Social Norms and Social Capital; Model Evaluation and Testing; Comparative Studies of Particular Economies; Europe,

## RESUMEN

La función empresarial cobra especial relevancia en la explicación del proceso de desarrollo económico. Desde la perspectiva cognitiva, la intención empresarial es el elemento fundamental que lleva a la creación de una empresa. El objetivo fundamental de este artículo es, por tanto, analizar si diferentes percepciones influyen sobre las intenciones empresariales y examinar las posibles diferencias entre los empresarios potenciales de dos áreas europeas: los países del sur (España, Italia, Grecia y Portugal) y los países escandinavos (Finlandia, Suecia y Dinamarca). El análisis empírico, mediante regresión logística con datos del Global Entrepreneurship Monitor, muestra que las percepciones personales, de oportunidad y socio-culturales contribuyen a explicar la intención emprendedora. El papel de las diferencias culturales e institucionales es considerado en las conclusiones.

*Palabras claves:* Creación de empresas, Capital social y normas sociales; Evaluación y Validación de Modelos; Estudios Comparativos entre Economías; Europa.

*Clasificación JEL:* M13; Z13; C52; P52; O52.



## 1. INTRODUCTION

In general, social researchers agree that entrepreneurship is very important to promote the development process (Audretsch and Thurik, 2000; Baumol, 2002; Fontela, Guzmán, Perez and Santos, 2006; Guzmán, 1994; Hébert and Link, 1989; Santos, 2004; Schumpeter, 1934; Wennekers and Thurik, 1999). In fact, the objectives of the different approaches to entrepreneurship can be summarised in the desire to look for an explanation of why, how, when or where entrepreneurs discover and exploit opportunities which promote the development process (Shane and Venkataraman, 2000).

Following a multidisciplinary focus, the cognitive approach is acquiring a great relevance nowadays to explain entrepreneurship not only at the individual level (Krueger, Reilly and Carsrud, 2000), but also at the aggregate level (Arenius and Minniti, 2005). Both potential and existing entrepreneurs capture the influence of the external environment through their motivations and perceptions, generating attitudes and intentions which determine behaviours. Nevertheless, the current emphasis on entrepreneurial cognition has evolved throughout the development of the entrepreneurship research domain.

This paper, following the cognitive perspective, tries to contribute to the understanding of one of the aspects of the discovery-exploitation process. Specifically, the main objective is to analyse the role of different perceptions in the formation of intentions towards start-up (Krueger, 2000). Perceptions are a cognitive construct. They are mental representations of the external environment around individuals, captured through their senses and elaborated in their mind. These representations may differ among individuals because of the presence of different cognitive biases. That is to say, the tendency to make errors in judgment when facing complex problems with incomplete information (Baron, 1998; Busenitz and Barney, 1997). Entrepreneurs, because of their work under conditions characterized by high uncertainty and time pressure, have a high susceptibility to several cognitive biases, affecting their level of perceptions. In this sense, compared to other people, they can perceive lower risk levels or higher confidence in their own capacities to start a business.

Until now, the cognitive entrepreneurship literature has studied the influence exerted by some perceptions on the intentions to start-up, restricting

the analysis to an individual level and using small samples, generally made up of students attending MBA programmes (Kolvereid, 1996; Krueger, 1993; Krueger et al., 2000). Cross-national studies of this kind are rare, since large international surveys are needed. In this sense, the Global Entrepreneurship Monitor research project ([www.gemconsortium.org](http://www.gemconsortium.org)) annually collects data on the entrepreneurial activity in 43 countries around the world (Bosma, Jones, Autio and Levie, 2008). This survey is very relevant not only for our understanding of the entrepreneurial process, but also for the more general understanding of the economic development process.

GEM questionnaires include some cognitive items that may allow analysing entrepreneurial intentions at an aggregate level (Reynolds et al., 2005), although it is not without some limitations. Specifically, for this paper perceptions been divided into three groups: individual perceptions (role model, self-efficacy and risk aversion), perceptions on economic opportunities, and, finally, socio-cultural perceptions (perceptions about the social legitimization of entrepreneurship).

The empirical analysis regarding the relationship between perceptions and start-up intentions has been restricted in this study to a comparison between Scandinavian and Mediterranean countries in Europe. These two set of countries are probably formed by the most developed (Scandinavian) and least developed (Mediterranean) countries of EU-15. The development gap between both groups may be partially based on the different models of development followed in each area. These two models are revealing that people from northern and southern Europe have different values and attitudes on economic and business activity (Hofstede, 1980).

Therefore, using GEM data, the empirical objective of this study has specifically been finding out whether differences do exist in the level of entrepreneurial intentions and in the influence of entrepreneurial perceptions on intentions among these two European regions. The findings of the analysis will be important at least in two respects. Firstly, they will help explain whether entrepreneurial perceptions play a similar or different role in regions with different level of economic development within the European Union. Secondly, it will stress the need to design some specific national policies to promote entrepreneurship and, therefore, economic development in regions with low start-up levels.

## 2. THE THEORETICAL BACKGROUND

The relevance of cognitive processes in shaping the individual's entrepreneurial decisions and actions has been stressed elsewhere (Baron, 2004; Krueger, 2000; Mitchell et al., 2002a, 2004; Shaver and Scott, 1991). In this sense, this paper studies at an aggregate level the role of perceptions, as one of the most important cognitive factors in the intention to start a business. In this second section, the literature related to the importance of

entrepreneurial cognition is reviewed. Then, derived from this literature, three distinct kinds of perceptions are considered: individual, socio-cultural and economic perceptions.

## 2.1. THE ENTREPRENEURIAL COGNITION APPROACH

The focus of entrepreneurship research which emerged from the interaction of socio-psychology and organizational management started paying attention to the most important characteristics which could differentiate entrepreneurs from non-entrepreneurs (Gartner, 1989). The most important personality traits found by this literature were achievement motivation, need of independence, internal locus of control and moderate risk-taking propensity (Borland, 1975; Brockhaus, 1980; Collins and Moore, 1964; Jennings and Zeithaml, 1983; McClelland, 1961). Some scholars even proposed a dark side of entrepreneurs, emphasizing their need for control, dissatisfaction, distrustful behaviour or scapegoat feelings (Kets de Vries, 1985).

This trait approach was complemented by the analysis of the influence of some demographic variables on the start-up rate. Among these variables, the following may be highlighted: age, gender, religion, ethnic group, education, socioeconomic status or professional experience (Cooper and Dunkelberg, 1987; Reynolds, Storey and Westhead, 1994; Storey, 1994). A positive aspect of these approaches is that they have allowed to identify some significant relationships between demographics and personality traits with some entrepreneurial behaviours, such as innovation. Nevertheless, from a theoretical point of view, these approaches were criticised both for their methodological and conceptual problems and for their weak explanatory capacity (Gartner, 1989; Krueger et al., 2000; Robinson, Stimpson, Huefner and Hunt, 1991).

One important cause of the weak explanatory capacity attributed to the trait and demographic approaches is that they did not consider behaviour as a consequence of person-situation interactions, in contrast to their wide acceptance in cognitive psychology since the 1960s (Shaver and Scott, 1991). Fortunately, research has notably evolved and this cognitive approach has gained much relevance in the attempts to explain entrepreneurship nowadays (Baron, 2004; Krueger and Carsrud, 1993; Mitchell et al., 2002a, 2004).

The cognitive approach emphasizes the fact that everything we say or do as human beings is influenced by mental processes, such as motivation, perceptions or attitudes (Krueger, 2003). Through these processes, people acquire information, store it, transform it and use it to accomplish different tasks, such as making decisions or solving problems. According to Mitchell et al (2002a), "entrepreneurial cognitions are the knowledge structures that people use to make assessment, judgement or decisions involving opportunity evaluation, venture creation and growth".

Studies which first developed the cognitive approach to entrepreneurship were those focused on motivation (Collins and Moore, 1964; McClelland,

1961). Motivation is the set of reasons that determines individuals to engage in a particular behaviour, for instance, the start-up (Shane, Locke and Collins, 2003). However, related to motivation studies and the intention to start-up, the social learning theory (Bandura, 1977, 1982) is probably the cognitive approach to entrepreneurship which has awakened the most interest among scholars. According to it, behaviour is the consequence of environmental stimuli, feed-back process and observational learning. Following this line of research, Ajzen built his theory of planned behaviour (TPB) stating that intentions capture the motivational factors which influence behaviour. Thus, they become measures of the effort the individual plans to exert in order to perform the behaviour (Ajzen, 1991). The influence of Bandura's and Ajzen's works has been very important in entrepreneurial cognition research because they define some important individual perceptions, such as, for instance, self-efficacy. These perceptions have been useful to entrepreneurship scholars in explaining why entrepreneurs start a business, (Kolvereid, 1996; Krueger, 1993, 2003; Liñan and Chen, 2009; Shapero and Sokol, 1982).

More recently, the entrepreneurial cognition approach has been paying attention to the analysis of cognitive biases and heuristics (Baron, 1998; Busenitz and Lau, 1996; De Carolis and Saporito, 2006; Keh, Foo and Lim, 2002; Simon, Houghton and Aquino, 2000) Cognitive biases represent a person's tendency to make errors in judgment based on cognitive factors, such as perceptions and motivations. Heuristics are efficient rules coded by evolutionary or learned processes. These rules help explain why and how people, such as existing entrepreneurs or potential entrepreneurs, make decisions, come to judgments or solve problems, when facing complex matters with incomplete information. Therefore, biases and heuristics are very important in the decision-making process. For instance, in order to successfully start a new business when an opportunity is discovered, it is not possible to wait for all the necessary information to be available because then, probably, the opportunity will be gone (Busenitz and Barney, 1997).

To sum up, perceptions are the central cognitive element of analysis in both entrepreneurial cognitive focuses. Specifically, perceptions are representations of the external environment around individuals captured through our senses and consciousness (Krueger, 2003). They represent a subjective interpretation of reality, and therefore do not necessarily reflect objective circumstances (Arenius and Minniti, 2005). For the purposes of this study, it may be useful to differentiate three different categories of perceptions that may be affecting the individual's entrepreneurial intention.

## 2.2. INDIVIDUAL PERCEPTIONS AFFECTING ENTREPRENEURIAL INTENTIONS

Bandura's (1977) work has emphasized the relevance of two important perceptions in social learning: role model perception and self-efficacy. They have consistently been introduced into entrepreneurial cognitive research



(Kolvereid, 1996; Krueger et al., 2000; Liñán and Chen, 2009). Firstly, role model theory explains the process of learning by copying the action of other persons through observing them doing it. This theory has been applied to entrepreneurship research to explain why individuals whose parents are entrepreneurs become entrepreneurs (Arenius and Minniti, 2005; Scherer, Brodzinsky and Wiebe, 1991). In this sense, role modelling is different to imitation because observational learning and perceptions change the behaviour of individuals through a cognitive process of four stages: attention, retention, reproduction and, finally, motivation (Bandura, 1977).

On the other hand, the concept of self-efficacy is the belief in one's own capabilities to perform an action and to attain different outcomes (Bandura, 1982). Thus, individuals considering themselves as capable of successfully performing as an entrepreneur, will have a greater probability of becoming entrepreneurs or, at least, of exhibiting entrepreneurial intentions (Krueger and Carsrud, 1993). This concept is different to the internal locus of control which means that people believe the outcomes of their actions as depending on their own effort (Borland, 1975). Although there is a correlation among these two concepts, it is possible to have an internal locus of control but low self-efficacy (Robinson et al., 1991).

Related to the concept of self-efficacy, entrepreneurship research developed some entrepreneurial intention models. The most important early contribution to this approach is the 'entrepreneurial event' theory (Shapero and Sokol, 1982). According to this, individuals decide to create a firm when the entrepreneurial activity is perceived to be more desirable and more feasible than other alternatives. Perceived feasibility refers to the perception of the ability to perform the entrepreneurial behaviour or, in other words, self-efficacy.

Similarly, Krueger and Casrud (1993) apply the theory of planned behaviour (TPB) developed by Ajzen (1991) to explain entrepreneurial potential. According to them, the intention to set up a new firm is influenced by three perceptions: personal attraction to entrepreneurial activity, perceived subjective norms (perception that people in their closer environment would approve of the firm-creation decision) and again perceived behavioural control or self-efficacy (Krueger et al., 2000).

Finally, entrepreneurial cognition research has focused on risk perceptions as an important factor influencing the start-up process (Simon et al., 2000). A high risk perception is expected to be a negative influence on entrepreneurial intention. Risk perception may be considered as a consequence of fear of failure (Arenius and Minniti, 2005). That is to say, fear of the uncertainty about economic or even social and psychological rewards inherent to the venture creation process.

Risk propensity of entrepreneurs was firstly studied during the 1970s as a factor which could differentiate entrepreneurs from non-entrepreneurs. These researchers expected entrepreneurs to be people with a higher willingness to

take risky actions compared to others. However, results have shown that risk propensity was very similar between entrepreneurs and non-entrepreneurs (Brockhaus, 1980). It may be argued that this “traits perspective” failed to explain the role of risk in entrepreneurship because it did not consider the influence of the cognitive process. The cognitive approach has shown that risk plays an important role in, for instance, entrepreneurial intentions (Shane et al., 2003). Objectively, situations faced by entrepreneurs are more risky than situations faced by managers. However, the former perceived less risk than the latter because of cognitive biases, such as, for instance, overconfidence (Simon et al., 2000). For this reason, potential entrepreneurs are expected to perceive lower risks and show lower fear of failure and, therefore, their intentions of becoming entrepreneurs would be higher.

To sum up, the following proposition is established:

*Proposition 1:* These three individual perceptions (knowing a role model, having high self-efficacy and low risk perception) will exert a positive influence on entrepreneurial intentions.

### 2.3. PERCEPTIONS OF ECONOMIC (OR ENTREPRENEURIAL) OPPORTUNITIES

As it is well-known, economic conditions are related to the start-up rate. The literature suggests that a high level of economic development (high national income per inhabitant, a well-educated population, a high life expectancy) and a positive economic cycle (low interest rates, budget surplus, low inflation, low unemployment rate, high economic growth) exert a positive influence on the creation of new firms (Thurik, Uhlaner and Wennekers, 2002). Nevertheless, GEM data has found that less developed countries usually characterized by negative economic conditions have recorded higher new-venture rates than most developed countries. An explanation of this behaviour is that the degree of economic welfare provided by a good economic situation determines the existence of job alternatives for people (Wennekers, van Stel, Thurik and Reynolds, 2005). In fact, only when unemployment became an important problem during the seventies and eighties, did the start-up rate grow more intensively in developed countries, although not at the same level as in less developed countries (Carlsson, 1996).

Besides, one important qualitative difference between businesses started in highly-developed and less-developed countries is that most people are motivated by economic opportunities in the former and most people are motivated by economic necessity in the latter (Bosma et al., 2008). Then the question is, why do some people and not others discover these economic opportunities? A plausible explanation to this fact is that the discovery of opportunities is not a mechanical process (Baumol, 1993). The specific characteristics of markets, such as their size or composition, and the availability of financing and different kinds of capital (physical, technological, human or social) can increase economic opportunities since they increase potential profits. This, in turn,



would raise the amount of people engaged in the start-up process (Casson, 1982; Wilken, 1979). However, even in this case, it is necessary for individuals to perceive those economic opportunities as feasible and desirable (Krueger, 2000). Therefore, again the cognitive process makes some individuals more sensitive than others to the different economic opportunities provided by the market and the available resources (Ardichvili, Cardozo and Ray, 2003; Shane and Venkataraman, 2000).

In this sense, the general evolution of economic or entrepreneurial opportunities expected by people will have a macroeconomic effect on the aggregate level of entrepreneurial intentions and on the overall start-up rate (Thurik et al., 2002). But, at the individual level, individuals will tend to show entrepreneurial intentions and exhibit start-up behaviours depending on their cognitive process and their perceptions of the existence of economic opportunities, independently of the realism of these perceptions (Arenius and Minniti, 2005).

It might be argued that people with entrepreneurial intention will tend to perceive more opportunities, reversing causation. However, the perception that there are generally good opportunities in the market is expected to contribute to the decision to start-up. But, on the other hand, having intention needs not make the person think there are good opportunities (e.g., if the person has just lost his/her job).

An important question is whether the perception of entrepreneurial opportunities is an antecedent of other perceptions, such as self-efficacy or risk perception, or not. In this sense, according to Krueger (2003), the perception of entrepreneurial opportunities could act as a precipitating factor because it reinforces other individual perceptions in the formation of intentions.

Therefore, these arguments lead to the following proposition:

*Proposition 2:* A positive perception of entrepreneurial opportunities will exert a positive influence on entrepreneurial intentions, reinforcing the role of individual perceptions.

## 2.4. SOCIO-CULTURAL PERCEPTIONS

Finally, the entrepreneurship literature has also studied the influence of cultural and sociological aspects on opportunity recognition and entrepreneurial intention through cognitive mechanisms. Culture is made up of ideas, values and norms common to a group of people. In fact, Inglehart (1997) defines culture as the set of basic common values which contributes to shaping people's behaviour in a society. According to Hofstede and Hofstede (2005), the notion of culture also includes patterns of thinking, feeling and acting, which are learned and shared by people living within the same social environment. He calls these patterns of behaviour "software of the mind" and, thus, defines culture as the collective programming of the mind which distinguishes the members of a group of people from others.

According to the literature, culture may influence entrepreneurship both through social legitimation and through promoting certain positive attitudes related to firm creation on individuals (Davidsson, 1995; Etzioni, 1987; Liñan and Santos, 2007; Wilken, 1979). As Hofstede (1980) pointed out, culture shapes people's cognitive schemes, programming behavioural patterns which are consistent with the cultural context. Moreover, these cognitive schemes derived from culture can help entrepreneurs in several aspects (Busenitz and Lau, 1996): reducing the uncertainty of making a decision, identifying cause/effect relationships to advance the development of ideas and opportunities, facilitating forecasts and predictions about outcomes and, what is most important in this study, increasing the intention to start up.

From an empirical point of view, studies about the cultural influence on entrepreneurial behaviours (Mcgrath, MacMillan, Yang and Tsai, 1992; Mueller and Thomas, 2001; Wennekers et al., 2005) have used Hofstede's (1980) four dimensions of national culture: masculinity (MAS), power-distance (PDI), individualism (IND) and uncertainty avoidance (UAV). In general, as McGrath et al. (1992) argue, entrepreneurs tend to exhibit high masculinity (MAS+), high power distance (PDI+), high individualism (IND+) and low uncertainty avoidance (UAV-) across cultures. Others scholars, however, such as Mueller and Thomas (2001), have found that low power distance (PDI-) would favour entrepreneurship.

Mitchell et al. (2000), based on a combination of expert information processing, entrepreneurship and social cognition literatures, analysed the role of cultural cognitions on venture creation. Differences across countries were detected in the level and nature of ability and willingness cognitions. In a subsequent study (Mitchell et al., 2002a; Mitchell et al., 2002b), entrepreneurial cognitions across cultures were found to be broadly similar, but with significant differences depending on the national culture. To sum up, cultural cognition matters in the formation of entrepreneurial intentions.

Therefore, this leads to the following proposition:

*Proposition 3:* Some entrepreneurial values within a culture, such as perceived social legitimation, exert a positive influence on the entrepreneurial intention.

### 3. METHODOLOGY

As it was pointed out in the introduction section, the empirical analysis will be developed using the GEM database. Nevertheless, our greatest interest in this paper is focused on the analysis of entrepreneurial intentions in a specific set of countries: Scandinavian and Mediterranean countries in Europe. This selection is due to two main reasons. On the one hand, this set of countries includes the most developed (Scandinavian) and the least developed countries (Mediterranean) in the EU-15. These two groups have different development models and different socio-cultural values regarding economic and business

activity (Romero and Fernández, 2007). On the other hand, these two groups of countries have shown a different economic evolution during the last few years, with southern countries showing, on average, both a faster path of economic growth and a higher entrepreneurial activity rate.

Table 1 shows individual-country information regarding per-capita income and unemployment levels. Scandinavian countries, as may be seen, have a much higher income level, together with lower unemployment. And this situation has been maintained since the mid-1990's. However, a closer look at the data makes evident that, except Italy, the rest of southern European countries exhibit a more positive performance regarding the evolution of GDP per capita and unemployment than the Scandinavian countries, supporting a slow but sustained convergence between both regions in recent years.

TABLE 1: CONVERGENCE LEVELS OF MEDITERRANEAN AND SCANDINAVIAN COUNTRIES

GDP <sub>PC</sub> (EU 15 = 100)	1997	2000	2003	2006
Greece	73.2	72.9	81.0	83.9
Spain	80.8	84.4	88.8	92.7
Portugal	65.9	67.6	67.5	68.0
Italy	103.0	101.4	97.4	92.5
<i>Mediterranean</i>	<i>80.7</i>	<i>81.6</i>	<i>83.7</i>	<i>84.3</i>
<i>Mediterranean (excluding Italy)</i>	<i>73.3</i>	<i>75.0</i>	<i>79.1</i>	<i>81.5</i>
Finland	95.8	101.6	99.3	102.3
Sweden	106.8	109.9	107.8	108.2
Denmark	115.2	114.1	109.1	109.5
<i>Scandinavian</i>	<i>105.9</i>	<i>108.6</i>	<i>105.4</i>	<i>106.7</i>
UNEMPLOYMENT RATE	1997	2000	2003	2006
Greece	:	11.2	9.7	8.9
Spain	16.7	11.1	11.1	8.5
Portugal	6.7	4.0	6.4	7.8
Italy	11.3	10.1	8.5	6.8
<i>Mediterranean</i>	<i>11.6</i>	<i>9.1</i>	<i>8.9</i>	<i>8.0</i>
<i>Mediterranean (excluding Italy)</i>	<i>11.7</i>	<i>8.8</i>	<i>9.1</i>	<i>8.4</i>
Finland	12.7	9.8	9.0	7.7
Sweden	9.9	5.6	5.6	7.0
Denmark	5.2	4.3	5.4	3.9
<i>Scandinavian</i>	<i>9.3</i>	<i>6.6</i>	<i>6.7</i>	<i>6.2</i>
<i>EU (15 countries)</i>	<i>9.8</i>	<i>7.7</i>	<i>7.9</i>	<i>7.7</i>

Source: Eurostat.

In this sense, the study of differences in the start-up intentions of these two European regions is interesting for two reasons. Firstly, they will help explain whether entrepreneurial perceptions play a similar or different role in regions

with different level of economic development within the European Union. Secondly, it will stress the need to design some specific national policies to promote entrepreneurship and, therefore, economic developments in regions with lower start-up levels.

This empirical analysis may be divided in two complementary parts. First, a binominal logistic regression model will be estimated on the full sample, to verify the propositions derived in the theory section. Secondly, the model will be estimated for each of the two differentiated groups of countries: Southern economies (Greece, Italy, Portugal and Spain) and Scandinavian countries (Denmark, Finland and Sweden). This second part of the analysis will test the existence of disparities among both regions with regard to entrepreneurial intentions and the role of perceptions in determining it.

### 3.1. SAMPLE AND VARIABLES

The sample used for the analysis has been obtained from the Global Entrepreneurship Monitor database. GEM questionnaires include some cognitive items that may allow analysing entrepreneurial intentions at an aggregate level (Reynolds et al., 2005). Therefore, GEM data has the advantage of helping to overcome some of the limitations of previous works, since it is based on a large international survey of the general adult population. Nevertheless, since the GEM questionnaire does not have among its main objectives to get information about entrepreneurial intentions and perceptions, it is not possible to fully test all the perceptual variables considered in the literature (Ajzen, 1991; Kolvereid, 1996; Liñan and Santos, 2007). However, we can at least analyse some of them.

Specifically, the “2004 APS Data – Individual Level (all respondents, all countries)” was downloaded from the consortium web page<sup>1</sup>. This data set includes a total of 145189 observations. The criterion for country selection was geographical location: the Three Scandinavian countries and the four Mediterranean European countries participating in the GEM research project were chosen for the analysis.

A depuration process was carried out to eliminate all observations with missing data in any of the selected variables. Additionally, since our target population are potential entrepreneurs, all individuals involved in any stage of entrepreneurial activity (nascent and established entrepreneurs) were excluded. The final usable sample included a total of 26210 observations. Its regional distribution is summarised in Table 2.

<sup>1</sup> [http://www.gemconsortium.org/about.aspx?page=gem\\_datasets](http://www.gemconsortium.org/about.aspx?page=gem_datasets).

TABLE 2: SAMPLE DISTRIBUTION BY REGION

European Region	<i>Entrepreneurial intention</i>		
	NO/NONE	YES	Total
Scandinavian	16915 (93.53%)	1171 (6.47%)	18086 (100.00%)
Mediterranean	7754 (95.45%)	370 (4.55%)	8124 (100.00%)
Total	24669 (94.12%)	1541 (5.88%)	26210 (100.00%)

The empirical study tries to identify significant variables that help estimate the likelihood of an individual expressing intention to start a business within three years (potential entrepreneur). The specific variables used to measure concepts developed in the theory section are the following:

1. Entrepreneurial intention (dependent variable): respondents were asked whether they intend to start a business within three years (0=No, 1=Yes). As may be observed in Table 2, there is a statistically significant difference ( $p < 0.001$ ), indicating that the proportion of potential entrepreneurs is higher in Scandinavia than in Mediterranean countries.
2. Individual perceptions:
  - a) Role Model: respondents were asked whether they personally knew someone who had started a business in the two years preceding the survey (0=No, 1=Yes).
  - b) Self-efficacy: respondents answered if they believed they have the required skills and knowledge to start a business (0=No, 1=Yes).
  - c) Risk perception: whether fear of failure would prevent them from setting up a business or not (0=No, 1=Yes).
3. Perceptions on economic (entrepreneurial) opportunities: respondents stated if they think there would be good opportunities to start a firm in the area where they live in the six months following the survey (0=No, 1=Yes).
4. Socio cultural perceptions:
  - a) Desirable career choice: respondents perception that in their country, most people consider starting a new business a desirable career choice (0=No, 1=Yes).
  - b) Status and respect: agreement with the statement that in their country, those successful at starting a new business have a high level of status and respect (0=No, 1=Yes).
  - c) Public media: agreement with the statement that in their country, they will often see stories in the public media about successful new businesses (0=No, 1=Yes).
5. Control variables: standard demographic and economic variables.
  - a) Age: exact age at time of interview, the respondents were asked to provide their year of birth (numerical variable).
  - b) Gender: (0=Female, 1=Male).

- c) Education level: respondents were asked to provide the highest degree they had earned. The GEM coordination unit harmonize responses across all countries into a five-category variable (0=No education, 1=Some secondary education, 2= Secondary degree, 3=Post secondary education, 4= Graduate degree). However, since none of the respondents in our selected sample chose the first option, the reference category for the logistic regression will be “some secondary education”.
- d) Income level: respondents were asked to provide information about their household Income. Responses are harmonized across all countries into 3 categories based on the income distribution of the country of origin (0=lower, 1=middle, 2=upper income group).
- e) Work status: respondents were asked to provide their occupational status (0=Full or part time work, 1=Not working, 2=Retired or student).

### 3.2. PROPOSED REGRESSION MODEL

The logit regression model estimates the probability that an individual belongs to a certain group (dependent=1), or not (independent=0). It also identifies the most important variables explaining the differences among both groups. Additionally, logit models do not make assumptions about the statistical distribution of the variables (Greene, 2002). In this empirical study, therefore, the use of a logit model would be fully justified on three grounds:

- The dependent variable is dichotomous.
- The great majority of independent variables are also dichotomous or categorical.
- It allows analysing the effect of a certain level of the independent variables on the probability that the studied event is present (in this case, being a potential entrepreneur).

Goodness of fit of the models is assessed by the Omnibus test for model coefficients, the Hosmer-Lemeshow test, the rate of correct classification and the pseudo-R<sup>2</sup>. The significance of individual independent variables was tested using the Wald statistics.

## 4. RESULTS

In the theory section, three propositions have been derived regarding the influence of perceptual variables in the entrepreneurial intention of the adult population. They will be tested by introducing each group of variable in a subsequent logit model. After these results are presented, the attention will shift to the comparison of Scandinavian and Mediterranean countries.



#### 4.1. PERCEPTUAL VARIABLES ON INTENTION

A collinearity analysis was performed to avoid biased estimations of the coefficients. The Variance Inflation Factor (VIF) and Condition indexes were used for this purpose. The multicollinearity test was satisfactory, since the highest VIF was 1.2, and the highest condition index 15.4, well below the 20.0 threshold suggested by Belsley, Kuh and Welsch (1980).

Five logistic regressions have been performed, as shown in Table 3<sup>2</sup>. The first one includes only demographic and socioeconomic characteristics as independent variables. Model 2 includes individual perceptions. Model 3 adds perceptions on entrepreneurial opportunities, whereas model 4 includes socio-cultural perceptions. Finally, in model 5 a dummy variable has been introduced to indicate the region (Scandinavian = 0, Mediterranean = 1).

TABLE 3 : LOGISTIC REGRESSIONS ON ENTREPRENEURIAL INTENTION<sup>a</sup>

	Model 1		Model 2		Model 3		Model 4		Model 5	
	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Constant	-2.125***	0.119	-2.812***	0.060	-2.971***	0.051	-3.026***	0.048	-2.951***	0.052
Gender	0.851***	2.343	0.549***	1.731	0.524***	1.689	0.524***	1.688	0.520***	1.682
Age	-0.037***	0.964	-0.039***	0.961	-0.039***	0.962	-0.039***	0.961	-0.039***	0.961
Work										
Work (1)	-0.117	0.890	0.041	1.042	0.040	1.041	0.035	1.036	0.754**	1.025
Work (2)	-0.104	0.901	0.192	1.212	0.196	1.217	0.205	1.228	0.366**	1.442
Education										
Education (1)	0.564***	1.758	0.441***	1.555	0.426***	1.531	0.426***	1.531	0.415***	1.514
Education (2)	0.143	1.153	0.070	1.072	0.049	1.050	0.060	1.062	0.235	1.265
Education (3)	0.879***	2.407	0.692***	1.997	0.650***	1.915	0.654***	1.923	0.595***	1.813
Income										
Income (1)	0.023	1.023	-0.065	0.937	-0.066	0.936	-0.070	0.932	-0.069	0.933
Income (2)	0.036	1.037	-0.177*	0.838	-0.199**	0.819	-0.205**	0.815	-0.211**	0.809
Role Model			0.858***	2.359	0.820***	2.271	0.808***	2.243	0.784***	2.191
Risk perception			-0.362***	0.696	-0.342***	0.710	-0.340***	0.712	-0.323***	0.724
Self efficacy			1.285***	3.614	1.247***	3.479	1.245***	3.472	1.263***	3.536
Entrep Opport.					0.436***	1.547	0.424***	1.528	0.422***	1.525
Desirable Career							-0.039	0.962	-0.016	0.984
Respect							-0.005	0.995	-0.015	0.985
Public_Media							0.211***	1.235	0.193***	1.213
Region									-0.286***	0.752

Significance levels based on Wald statistic: \*\*\* significant at  $p < 0,001$ ; \*\* significant at  $p < 0,01$ ; \* significant at  $p < 0,05$

<sup>a</sup> A cut-off value of 0.058 is used.

<sup>2</sup> As a precautionary measure, a probit analysis was also performed. Results were fully in accordance with those presented in the text.

Global results are relatively satisfactory, as may be seen in Table 4. The omnibus test is always significant ( $p < 0.05$ ), denoting acceptance of the hypothesis that  $\beta$  coefficients are different from zero. Nevertheless, the variables considered here only explain a limited fraction of the variance in entrepreneurial intentions (pseudo R-squared statistics). Additional variables are probably needed to complement those included in models 1 to 5. In this sense, the Hosmer-Lemeshow test confirms this idea. A cut-off value of 0.058 has been used (corresponding to the percentage of individuals stating entrepreneurial intentions). For this reason, the percentage of correctly classified cases (which ranges from 63.0% to 70.1%) is reasonably satisfactory when compared with the reference 5.8% level.

Model 1 is the basic model including only variables related to socio-demographic characteristics (Table 2, for a distribution of demographic characteristics of respondents, see appendix). As may be seen, age, gender and education significantly contribute to explaining the entrepreneurial intention of respondents, with the expected signs. Thus, males are 2.343 times as likely as females to declare a positive intention (odds ratio). Similarly, a higher education level is associated with higher intentions, with odd-ratios ranging from 1.153 to 2.407. The effect of age is reversed, as expected, since every additional year of age of respondents is associated with decreasing probability to show entrepreneurial intention (Levesque and Minniti, 2006)<sup>5</sup>. These three results are notably robust, since they are maintained even when additional variables are included (models 2 to 5).

Model 2 tries to verify proposition 1. The three individual perceptions considered have significant coefficients with the expected signs. In particular, the effects of knowing a role model or having self-efficacy are the strongest of all variables included (odds-ratios are 2.359 and 3.614, respectively). On the other hand, perceiving a high risk of failure contributes to decreasing entrepreneurial intentions. The contribution of socio-demographic characteristics remains essentially the same, with respect to both the sign and level of coefficients, and also to significance levels. The only difference relates to income. In model 1, higher income was positively associated with intention (although this result was not significant). The inclusion of individual perceptions has turned the effect of higher income negative and (for the highest income group) significant. Thus, once the effect of these perceptions has been considered, better-off people exhibit a lower intention to become entrepreneurs.

<sup>5</sup> Levesque and Minniti (2006) found a non-linear effect of age on entrepreneurial activity. Even though entrepreneurial intention is something different, we performed an additional regression to evaluate this possibility. Results confirm the non-linear effect of age. However, since the value and significance of the remaining coefficients were similar, we chose to keep the linear pattern for simplicity, and not to divert attention from the objective of this paper.



TABLE 4: GOODNESS-OF-FIT STATISTICS<sup>a</sup>

	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5
Omnibus test (significance level)	0.000	0.000	0.000	0.000	0.000
Cox and Snell pseudo R-squared	0.029	0.062	0.064	0.065	0.065
Nagelkerke pseudo R-squared	0.080	0.172	0.178	0.179	0.181
Hosmer-Lemeshow test (Signif. lev.)	0.017	0.001	0.002	0.002	0.000
Percentage correct	63.01	69.40	70.00	70.02	70.10

<sup>a</sup> A cut-off value of 0.058 is used.

Model 3 includes an additional variable measuring the individual's perception about the existence of entrepreneurial opportunities to start a firm in their area of residence. Proposition 2 is satisfactorily confirmed, since this variable has a significant and positive  $\beta$  coefficient, with a relatively high odds-ratio. Besides, the signs, level and significance of all the others variables are similar to model 2.

To test proposition 3, socio-cultural perceptions have been included in model 4. However, results support proposition 3 weakly, since only one of the three variables included is significant. Perceiving the society respects entrepreneurs and considers entrepreneurship to be a desirable career choice does not affect the intention level. In contrast, the perception that successful new businesses are frequently featured in the public media contributes to increasing the entrepreneurial intention of respondents. Nevertheless, the odd-ratio for this variable is relatively low (1.213).

Finally, a final regression was performed (model 5 in Table 3) to test for the existence of significant differences between Scandinavian and Mediterranean countries in Europe. Overall, results are satisfactory. The coefficient for this variable is significant and negative (entrepreneurial intention is lower in the Mediterranean countries). Besides, the model is significant, according to the Omnibus test, but the model fit is not satisfactory (see Table 4). Coefficients and significance levels of most other variables remain stable. The only relevant difference relates to work status, which becomes significant in model 5. Based on this result, it may be argued that some relevant differences do exist regarding the formation of entrepreneurial intentions in both areas. To try to better understand these disparities, separated analyses will be carried out for each sub-sample.

#### 4.2. REGIONAL DISPARITIES IN ENTREPRENEURIAL INTENTIONS

To carry out the analysis of regional disparities, the final logistic regressions in Table 2 will be computed for Mediterranean and Scandinavian countries. These are presented in Table 5. As may be observed, the coefficients for nearly

all the perception variables are the same in both areas. The only difference relates to the perceived social respect for entrepreneurs. However, this coefficient is non-significant for neither subsample.

Some socio-demographic characteristics tend to have a similar effect on entrepreneurial intentions in both areas. This is the case of age and gender. However, there are some differences that deserve closer attention. Thus, the effect of education differs in degree. In the Mediterranean countries, the strongest positive effect on intention is for those having a university degree, with a likelihood of declaring such intention 11 times higher than the reference group (those with some secondary education, odds ratio of 11.523). In Scandinavia, those having some postsecondary education but not a degree are those exhibiting a higher entrepreneurial intention (odds ratio of 8.325).

TABLE 5: REGIONAL LOGISTIC REGRESSION<sup>a</sup>

Variables	Mediterranean		Scandinavian	
	B	Exp(B)	B	Exp(B)
Constant	-3.52***	0.03	-2.788***	0.062
Gender	0.379**	1.461	0.577***	1.780
Age	-0.042***	0.959	-0.041***	0.960
Work				
Work(1)	0.098	1.102	0.023	1.023
Work(2)	0.154	1.166	2.072***	7.938
Education				
Education(1)	0.731***	2.078	0.306***	1.358
Education(2)	0.273	1.314	2.119***	8.325
Education(3)	2.444***	11.523	0.486***	1.626
Income				
Income(1)	-0.132	0.876	-0.028	0.973
Income(2)	-0.302*	0.739	-0.147	0.863
Role Model	0.971***	2.642	0.707***	2.028
Risk Perception	-0.335**	0.716	-0.299***	0.742
Self-Efficacy	1.631***	5.111	1.152***	3.165
Entrepreneurial Opport.	0.292*	1.339	0.466***	1.594
Desirable Career	-0.005	0.995	-0.01	0.990
Respect	0.045	1.046	-0.059	0.943
Public Media	0.255*	1.291	0.166*	1.180

Significance levels based on Wald statistic: \*\*\* significant at  $p < 0,001$ ; \*\* significant at  $p < 0,01$ ; \* significant at  $p < 0,05$ .

<sup>a</sup> A cut-off value of 0.046 is used for the Mediterranean sub-sample, and 0.065 for the Scandinavian sub-sample.

Work status and income level effects are clearly different. In Southern countries, higher income is associated with lower intention, but the odds ratio is not too low (0.739). In the northern group of countries, it is being retired or a student which makes respondents declare a much higher start-up intention (odds ratio of 7.938).

It may be said that these socio-demographic characteristics are those which differentiate both sub-samples. In this sense, when we look at individual and entrepreneurial opportunity perceptions, we find that both groups of variables are significant in both sub-samples, with equivalent coefficients and odds-ratios. This may be interpreted in the sense that the cognitive mechanisms people use to determine their start-up intentions are similar in both areas, but institutional circumstances differ (general level of education, employment conditions, unemployment rate, income level ...).

Finally, when socio-cultural variables are considered, they are generally non-significant in both subsamples. Only the featuring of successful entrepreneurs in public media contributes to increasing intention in both Mediterranean and Scandinavian countries. Even though the positive influence of the public media seems to be slightly higher in Mediterranean countries, the odds-ratio are very similar in both cases and relatively small (1.291 vs. 1.180).

TABLE 6: REGIONAL GOODNESS-OF-FIT STATISTICS<sup>a</sup>

	Mediterranean	Scandinavian
Omnibus test (significance level)	0.000	0.000
Cox and Snell pseudo R-squared	0.068	0.067
Nagelkerke pseudo R-squared	0.218	0.176
Hosmer-Lemeshow test (Signif. lev.)	0.152	0.006
Percentage correct	72.5	70.4

<sup>a</sup> A cut-off value of 0.046 is used for the Mediterranean sub-sample, and 0.065 for the Scandinavian sub-sample.

If we consider the general adequacy of the model for each subsample, the relevant tests are reported in Table 6. It is interesting to note that goodness-of-fit statistics are similar to those of the full-sample model. In fact, for the Mediterranean countries, they are even better, since the Hosmer-Lemeshow test indicates the model is a good approximation to the data, and the percentage of correctly classified observations is higher.

## 5. CONCLUSIONS

As was pointed out in the introduction to this paper, the cognitive approach to entrepreneurship is very important nowadays not only at the individual level but also at the aggregate level. In this respect, a first important contribution of this paper has been to provide a classification of different

perceptions related to entrepreneurial intentions. According to the literature, three groups of entrepreneurial perceptions have been found: individual perceptions, perceptions on economic opportunities and, finally, socio-cultural perceptions.

Similarly, the influence of those different perceptions on entrepreneurial intentions has usually been tested through empirical analyses on small samples of university students. Results have been very promising but it was necessary to carry out additional analyses at the aggregate level. In particular, the GEM project provides a good opportunity to perform this kind of analysis since it collects data on different aspects of the firm-creation process from several countries around the world. In this sense, the empirical objective of this paper has been, following the proposed classification of entrepreneurial perceptions, analysing GEM data to compare entrepreneurial intentions in two different European regions: Scandinavian and Mediterranean countries. As these two groups of countries are considerably different with respect to their cultural and economic background, a clear difference in the influence of perceptions on intentions was expected.

The first important finding of the empirical analysis is that the three kinds of perceptions proposed have a significant influence on intentions in the combined sample (Scandinavian and Mediterranean countries). As expected, individual perceptions (especially, self-efficacy and role model) are the most important antecedents of entrepreneurial intention (Krueger et al. 2000). Regarding perceptions on economic opportunities, this influence is not as high as expected. Our interpretation is that the literature may be emphasizing the role of opportunities without taking into account the important differentiation between developed and underdeveloped countries, and also between expansion and recession in the economic cycle. It may be the case that precisely the people with high intentions perceive the recognition of opportunities as the normal situation. It is possible too that the presence of cognitive biases is exerting an influence on perceptions about economic opportunities (Keh et al. 2002). As a consequence, therefore, people with entrepreneurial intention may be less worried about opportunities.

Results regarding socio-cultural perceptions in the combined sample are the weakest. Again the existence of cognitive biases or a positive environment to create firms in developed countries may make individuals take socio-cultural support for granted, thus diminishing its effect on intentions. As Davidsson (1995) argues for the case of Swedish regions, the relatively small differences in cultural values among respondents' countries would make these variables non-significant.

Therefore, there seems to be a common entrepreneurial culture broadly shared by both Scandinavian and Mediterranean countries. This is manifested in at least two aspects. On the one hand, as it has been pointed out, general results regarding socio-cultural perceptions for each sub-sample are very similar to results of the combined sample, in spite of the Scandinavian population

showing higher entrepreneurial intentions. On the other hand, the most important differences between sub-samples are found in some demographic variables (work status and education) and some individual perceptions (role model and self-efficacy), but not on perceptions about economic opportunities or on socio-cultural perceptions.

In Scandinavian countries, the influence of work status on entrepreneurial intentions (specifically, being retired or, most probably, a student) is significantly higher. This could be reflecting that young students are potential future entrepreneurs to a much greater extent than in Mediterranean countries. In some sense, this result partially explains why entrepreneurial intention is higher in northern Europe and even suggests why opportunity motivations are usually higher in Scandinavia for nascent entrepreneurs.

Regarding the influence of education, Scandinavian people show higher intentions when they have a post secondary level, while in Mediterranean countries intentions are the highest for university graduates. This would be related to the different emphasis placed on secondary education in each area. In general, technical training is more valued in northern Europe than in southern Europe. As a result, students with a post secondary education in Scandinavian countries have more entrepreneurial intention because they have acquired more abilities during their educational process and maybe feel more confident to be entrepreneurs.

Joint results found a negative effect of income level on entrepreneurial intention. This is not in contradiction with the usual finding that higher wealth is associated with start-up behaviour. In this sense, it is this effect on perceptions which is relevant to determine the entrepreneurial intention, and not wealth itself. Thus, better-off people will probably have more job opportunities available and need not become entrepreneurs. This result is stronger for the Mediterranean countries, suggesting that among higher-income groups in southern Europe, entrepreneurship is not the best valued career option. Therefore, Mediterranean countries need to implement policies to promote entrepreneurship as a desirable-career choice, as Scandinavian countries have been doing since the beginning of the 1990s.

Finally, regarding the influence of individual perceptions, the clearest differences are found with respect to role model and self-efficacy. On the one hand, the effect of personally knowing an entrepreneur on intentions is higher among the Mediterranean population. This is related to some cultural values of the Mediterranean society in which the role of family, friends or acquaintances is important. Conversely, the higher individualistic behaviour of northern European people (Hofstede and Hofstede, 2005) may make the influence of other entrepreneurs weaker in shaping their intentions.

On the other hand, the higher effect of perceived self-efficacy on entrepreneurial intentions in the Mediterranean countries is more difficult to interpret. As perception of entrepreneurial culture does not exert a clear influence on entrepreneurial intentions, the higher influence of self-efficacy on

entrepreneurial intention may be related to the level of economic development in southern Europe. This lower development level, together with a lower tradition in entrepreneurial activity, may result in people feeling they need to be more confident in their own capacities to run a business. Similarly, this may also help explain the higher effect of knowing a role model on entrepreneurial intentions in southern countries. Nevertheless, an obvious means of increasing self-efficacy is through improvements in the educational system in general, and through entrepreneurship education in particular.

Of course, this study has a number of limitations. Some of them are related to characteristics of the GEM database. First, the number of items related to entrepreneurial intentions and entrepreneurial perceptions is small in this database. Secondly, the kind of items included in the questionnaire prevent the use of more accurate statistical techniques, such as structural equations models that may show the different relationships among perceptions and intentions. In this sense, the fact that variance explained by the different models is low should be due to relevant theoretical variables being omitted. An obvious example is the case of desirability (Shapero and Sokol, 1982) or personal attitude towards start-up (Ajzen, 1991). We fully believe the GEM data provides a very relevant starting point for the analysis of these cognitive aspects of the firm-creation process. Nevertheless, if a more detailed analysis of the potential entrepreneur is to be carried out, the GEM questionnaire needs to include some additional items and other modifications. What is more, with that aggregated information, the relationship among intentions and actions (that is to say, among entrepreneurial potential and entrepreneurial activity) could be studied in greater depth.

As future extensions of this study, the comparison of these two regions in following years is an obvious avenue for research. Additionally, the methodology proposed may be applied to compare other countries or regions, and more detailed analysis will allow to assess the relative probabilities to state entrepreneurial intentions given the different values of explanatory variables. Finally, a test with the full GEM sample may be performed. On the other hand, a new questionnaire may be developed and tested to allow overcoming some of the limitations of the one used here.

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## APPENDIX

TABLE A1: DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

	(% for COUNTRY OF ORIGIN)	COUNTRY OF ORIGIN										Total
		Greece	Spain	Italy	Portugal	Denmark	Sweden	Finland				
GENDER	FEMALE	39.5%	49.1%	51.8%	25.0%	34.8%	51.3%	43.4%	50.5%			
	MALE	60.5%	50.9%	48.2%	75.0%	65.2%	48.7%	56.6%	49.5%			
WORK STATUS	WORK-F.T.P-T	73.0%	67.5%		100.0%	94.6%	74.8%	100.0%	71.7%			
	NOT WORKING	11.8%	20.9%	37.7%		4.3%	25.2%		25.9%			
	RETIRED STUDENTS	15.1%	11.6%	62.3%		1.1%			4.4%			
EDUCATIONAL ATTAINMENT	SOME SECONDARY	9.2%	60.6%	32.8%	65.0%	3.3%	58.9%	60.4%	58.5%			
	SECONDARY DEGREE	54.6%	14.7%	53.3%	20.0%		22.4%	20.8%	20.7%			
	POST SECONDARY	17.1%	24.7%		15.0%	37.0%			7.4%			
	GRAD EXP	19.1%		13.8%		59.8%	18.7%	18.9%	13.4%			
INCOME_STATUS	LOWEST 33%TILE	30.3%	36.3%	55.4%	25.0%	19.6%	33.9%	30.2%	34.8%			
	MIDDLE 33%TILE	26.3%	37.4%	36.9%	35.0%	28.3%	33.8%	32.1%	34.8%			
	UPPER 33%TILE	43.4%	26.3%	7.7%	40.0%	52.2%	32.3%	37.7%	30.4%			
AGE	Mean	37.5	40.5	48.4	39.3	42.3	43.0	45.1	42.3			
	Standard deviation	12.2	12.7	17.6	11.1	9.8	15.0	11.9	14.4			