Abstract
We have studied the relationship between optimism, pessimism and entrepreneurial attitudes among university undergraduate students \(n = 206\). We used the revised Life Orientation Test [1] as a measure of optimism and pessimism and we hypothesized that technological potential entrepreneurs are more optimistic and less pessimistic than non-potential entrepreneurs. Our results show a main effect of the entrepreneur profile on both the LOT-R scale and on the optimism dimension of the LOT-R scale, whereas there was not a significant effect on the pessimistic dimension of the LOT-R. Our results contrast with those presented earlier where actual technological entrepreneurs were studied [2]. Theoretical and practical implications for our results are discussed.
Keywords: entrepreneurship, high education, optimism, technology, Life Orientation Test.

1 INTRODUCTION
Although the human rationality is a long lasting issue of discussion, the general widely accepted idea is that the human being thinking is not based on logic [3]. In management and business creation settings it has been considered overoptimism as a serious threat against optimal decision-making [4]. Given that entrepreneurs are key points in the development of countries’ economies [5, 6], the objective of that brief report is to study the relationship between the technological potential entrepreneur, optimism and pessimism.

1.1 The technological potential entrepreneur
As Hébert and Link [7] pointed out, the Irish economist Richard Cantillon could be considered as the origin of the entrepreneurship research. From a psychological point of view, Cantillon [8] suggested that entrepreneurs are people who show high levels of uncertainty tolerance. By dealing with that uncertainty we could define entrepreneurs as “individuals and group of individuals seeking and exploiting economic opportunity” [9, p. 24].

In that work we have focused in a particular type of entrepreneur, the technological entrepreneur [10, 11]. And more specifically, we have studied the figure of potential entrepreneur [12, 13]. The technological entrepreneur is not different from the general entrepreneur but that particular type of business creator is focused in the commercialization of products and services derived from the latest technology, is generally younger, tends to encourage team work in the company and the origin of the business is frequently derived from spin-offs associated to universities or research centres. On the other hand, the potential entrepreneur is conceptualised as the person who has not already created a business but who would like to do so in the future. In the present study, we are going to consider that a potential entrepreneur is an undergraduate student who plans to set up a business after finishing his or her studies at the university. As a result, the technological potential entrepreneur is that person whose aim after leaving university is create a technology based business.

1.2 Optimism and entrepreneurship
Optimism is important in the context of entrepreneurship research because it is thought to play a similar role to achievement motivation [14] in the development of capital based economies. For example, Seligman [15] stressed that optimism could be considered as an Archimedean point to understand society wellbeing and that it is a central concern to countries development.

As noted by Lopez and García [13], optimism has been considered classically as a characteristic psychological trait in entrepreneurs [16]. In entrepreneurship literature the idea of optimism is associated with the idea of economical optimism [17]. However, Liang and Dunn [18, 19] have remarked that the optimism studied in the entrepreneurship field is quite similar to dispositional
optimism studied in psychology. Dispositional optimism refers to the belief that it is more likely for a person to experience good things instead of bad things [20].

High levels of optimism have been associated to health benefits [i.e. 20, 21], whereas in organizational contexts optimism has been associated with a higher enthusiasm, a better ability to cope with difficulties threatening company objectives, high ability to create coalitions, more productivity, more motivation and commitment [4, 22, 23]. However, an excess of optimism has been linked with low academic achievement, risky behaviours and non adaptive reactions when receiving negative feedback after performance [24-29]. On the other hand, in the business context optimism has been associated with a poor strategic decision-making, bad problems diagnosis or with a lack of initiative to name but a few [22, 23].

Crane and Crane [30] stressed that optimism is an essential trait of entrepreneurs. Liang and Dunn [18] have recently studied entrepreneurs’ optimism using the Life Orientation Test-Revised [1]. They found that optimism was related with creativity, prior management experience and with the tendency to look for new capital sources in case of a new business creation [18]. However, it has also been reported non differences between technological entrepreneurs and non-entrepreneurs in a scale of comparative optimism [2]. However, these results could be explained in terms of the scale used (related with health problems) and because the optimism associated with entrepreneurship in literature seems to be similar to dispositional optimism and not comparative optimism [18, 19].

1.3 Objective and hypothesis

Our main objective is to test whether technological potential entrepreneurs are more optimistic than non-potential entrepreneurs and general entrepreneurs. Although it has been shown that people are generally optimistic [31, 32], we expect to find that potential entrepreneurs and general entrepreneurs are more optimistic than non-potential entrepreneurs using a dispositional optimism scale. Our results could be useful defining the characteristics of potential entrepreneurs and for developing training programs for potential entrepreneurs.

2 METHOD

2.1 Participants

A sample of 205 undergraduate students participated in the study. Their ages ranged from 18 to 50 years old (\(M = 23.3, SD = 5.6\)) and 34.6% (\(n = 71\)) of the participants were male whereas 65.4% (\(n = 134\)) remaining were female. Participants were classified as non-potential entrepreneurs (\(n = 46\)), general potential entrepreneurs (\(n = 77\)), and technological potential entrepreneurs (\(n = 73\)). Participants were studying humanities related degrees (47.3%, \(n = 97\)), technology information sciences degrees (19%, \(n = 39\)), and economics related courses (31.7%, \(n = 65\)).

2.2 Materials

Participants were asked to fill in a web based questionnaire which was created using MrInterview (SPSS Inc.). In the first page the survey contained a set of items to collect socio-demographical information (sex, age, degree). In the second page two yes-or-not classification questions appeared (Do you think you are an entrepreneur? and would you like to create a technology-based business after finishing your studies?). We cross-tabulated the responses from these two questions, as suggested by Huefner et al. [12], generating a third variable that labelled each participant as technological potential entrepreneurs (people who think they are entrepreneurs and they plan to set up a technology based business), general potential entrepreneurs (people who think they are entrepreneurs but they do not plan to create a technology based company), non-potential entrepreneurs (people who both think they are not entrepreneurs and do not plan to set up a technology based business), and false technological potential entrepreneurs (people who think they are not entrepreneurs but they plan to create a technology based company).

We used the Spanish version [33] of the Life Orientation Test-revised (LOT) [1]. The scale contains ten items and four of them are filler items not usable to obtain test scores. Three items are expressed in the optimism direction and three in the pessimism direction. For each item, each participant must to answer in a five points Likert-type scale ranging from absolutely disagree (0) to completely agree (4). We obtained the total LOT score by reversing pessimism items (range = 0-23; \(M = 14.67; SD = 3.83; \alpha = 0.74\)), an optimism score by summing up the three optimism items (range = 0-12; \(M = 7.38; SD = 0.45\)).
2.10; $\alpha = 0.72$) and a pessimism score by summing up the pessimism items before reversal (range = 0-12; $M = 4.72; SD = 2.33; \alpha = 0.53$).

### 2.3 Procedure

We contacted with students through WebCT platform (Blackboard Inc.) by using the electronic mail tool. They were asked to fill in the electronic questionnaire as a voluntary task. No payment or reward was given to participants.

### 3 RESULTS

As can be seen in Fig. 1 technological potential entrepreneurs and general entrepreneurs are more optimistic than both non-potential entrepreneurs and false potential entrepreneurs. One-way analysis of variance showed a main effect of the entrepreneur profile on LOT score, $F_{(3, 201)} = 4.09, p < 0.01, r = 0.24$. Post hoc analysis showed that non-potential entrepreneurs were less optimistic than technological potential entrepreneurs but neither non-entrepreneurs and false potential entrepreneurs nor general potential entrepreneurs and technological potential entrepreneurs differed in their levels of optimism.

We also found a statistical effect in the optimism dimension of the LOT scale, $F_{(3, 201)} = 5.93, p < 0.01, r = 0.29$. However, in that case, post hoc analysis revealed that both technological potential entrepreneurs and general potential entrepreneurs were more optimistic than non-entrepreneurs (Fig. 2). Finally, there was not a significant effect on the pessimistic dimension of the LOT, $F_{(3, 201)} = 1.44, p = 0.34$ (Fig. 3).

![Figure 1. LOT scores as a function of entrepreneur profile](image_url)
Our results contrast with those presented by López and García [2] who studied the relationship between technological entrepreneurs and optimistic bias at the university. They found no significant optimistic bias in a sample of university professors classified as actual technological entrepreneurs compared with a sample of university professor self defined as non-technological entrepreneurs. As a result, our data suggest that the potential and the actual technological entrepreneur are different in terms of optimism. However, more research is needed because López and García used a comparative optimism scale whereas we have used a dispositional optimism scale. It is needed to determine whether the differences between actual potential technological entrepreneurs are equipped with a different type of optimism or whether the differences account for a particular evolution in the development of technological entrepreneurs. As others authors have pointed out before [23, 34, 35], risk tolerance and optimism could change depending on the stage of the new business development stage the entrepreneur is. As a consequence, it would be useful to design studies to test whether the
differences in optimism are due to a different personality profile in potential and actual entrepreneurs or whether the differences are the result of a different development stage.

In any case, our results are useful from an applied point of view and from a theoretical perspective. From an applied perspective, our results could be taken into account when designing training programs to improve entrepreneur’s skills. For example, potential entrepreneurs could be trained to manage adaptively their optimism in order not to be overoptimistic or to shift from optimism properly [24, 29]. In addition, our results could be useful to understand and define the personality of technological potential entrepreneurs, an issue that has puzzled social scientist in the recent decades [36]. Additionally, we suggest that a research exploring cultural differences among entrepreneurs could shed light on entrepreneurial optimism. We think that, as McClelland remarked [14]; cultural differences could influence optimism and shifts from optimism in entrepreneurs. A tentative hypothesis could be stated in terms of the differences between Eastern and Western entrepreneurs given the studies showing that causal attribution [i.e. 37-39] and science conception [40] is different in both subsamples.

REFERENCES


