



**ENTREPRENEURIAL INTENTION STABILITY IN UNDERGRADUATES STUDENTS, A
LONGITUDINAL ANALYSIS**

Trabajo Final de Master
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Abstract

There is a general agreement about the central role of entrepreneurship in development and well-being of societies. In this line, much work has been carried out by researches explaining entrepreneurial intention as the major predictor of entrepreneurship behavior, its antecedents and the impact of education on it. Nevertheless, very little has been made to analyze the temporal evolution of intentions, and even less with undergraduate samples. This paper aims to fill this gap in literature. The main objective is to identify intention's evolution over a period of three years in Business Management undergraduate students. An empirical analysis with a three wave longitudinal data has been carried out. This paper makes a contribution to EI field, especially in regard to its evolution during undergraduate years. We expect the findings shed some light on the factors affecting EI stability over time. Practical implications and future research are also commented.

Key words: university, entrepreneurship, entrepreneurial intention, longitudinal, stability, students.

JEL classification: A22, J23, L26

1. Introduction

Entrepreneurship is relevant in the promotion of economic activity; it is considered its seed (Mohar et al., 2007). It brings employment creation and wealth, and therefore economic development of societies (Wennekers et al., 1999) and it has been considered crucial for growth and development of the world economy among researchers (Liñán et al., 2007). Accordingly, research in entrepreneurship has had a significant growth in the last 20 years (Busenitz et al., 2014), which has been accentuated since 2007.

In 2004, the European Commission in its agenda for entrepreneurship underlines the aim of developing a more entrepreneurial mindset and suggests that education should contribute to fostering it, providing expertise to create business and increasing the perception of it as a career opportunity (European Commission, 2004). Krueger states that as well as from the context (role models) people learn beliefs and attitudes about the world, they learn their

beliefs about creating companies, and hence develop an entrepreneurial mindset (Krueger et al., 1994).

In this line, there are some studies indicating the crucial role played by universities stimulating skills, entrepreneurial skills and attitudes that lead to innovation (Toledano et al., 2008; Urbano et al., 2008), and therefore the creation of new business and professional development, which should end up becoming a sustainable competitive advantage (Chrisman et al, 1995; Kirby, 2002).

Some researchers delve in the relationship between university-business environment and its contribution to the creation of entrepreneurial mentality (Toledano et al., 2008), between work experience and entrepreneurial intention (EI) or orientation (i.e. proactivity, innovation and risk exposure) and performance (Wiklund et al., 2005). In particular for education and EI, comparisons among students of different academic disciplines, levels of study, and countries (Veciana et al., 2005), have been made. Generally, those studies uses general adult or last-year-students samples because individuals aged between 25 and 34 years are considered the population segment most likely to become entrepreneurs (Reynolds et al., 2002; Liñán et al., 2014).

Additionally, some authors have made longitudinal studies, but very little research analyses the stability of intentions and there is a considerable lack of long term longitudinal studies (not pre-post course or a yearlong) addressing this issue (Liñán et al. 2011a). Those studies, again, uses in general samples of general population or last year students, not students from initial formative stages (Wang et al., 2011; Byabashaija et al., 2011; Roxas, 2014; Díaz-García et al., 2015)

Zhao et al., (2005) in his research conclude that strengthening students' confidence has a relevant effect at the early, prelaunch stage of an entrepreneurial venture. In this sense, Liñán et al. (2011b) suggest that should be made greater efforts in enhancing the attractiveness of entrepreneurship at earlier stages of the education, contributing to develop more favorable personal attitudes towards this career option, but very little literature has been found in this regard (Alsos et al., 2012). Finally, has not been found studies analyzing the evolution of IE during the initial years in the university and to assess adequately the impact of it (quantitative longitudinal).

The aim is precisely to fill this gap by analyzing the evolution of EI in undergraduate students and, in particular, the effect of education on it. The present study carries out a preliminary

empirical approach to identify the intention's evolution over a period of three years in Business Administration undergraduate students. If confirmed, the study sample will be expanded and for data collection, unless new discoveries, entrepreneurial intention questionnaire (EIQ) designed (and tested) by Liñán will be used (Liñán et al., 2009; 2011a)

This document is organized as follows. In first place the theoretical background section is divided in two: 1) from general to specific aspects of EI, and 2) possible factors affecting EI stability where an in deep review of longitudinal studies is made. At the end of this section there are the hypotheses. Coming up next, empirical analysis' section, with results and discussions. And to end, conclusions, limitations, practical implications and future research lines are commented.

2. Theoretical background

2.1 Entrepreneurship review

As happen with many concepts under study, there are several definitions. Entrepreneurship, or entrepreneurial behavior, can be described as a career orientation, mindset and behavior toward starting up a business (Nabi et al., 2006; Liñán et al., 2011a), or as the discovery, evaluation and exploitation of an opportunity (Shane et al., 2000), for example. In this study, the first definition will be used, therefore, continuing the family business will not be considered as entrepreneurship.

According to some authors, entrepreneurship is a process and due to that occurs over time (Jack et al., 2002; Bygrave, 2003; Liñán, 2007). The concept is quite broad and may include many and different topics (Liñán et al., 2011b). Between them, Baron et al. (2004), e.g., specifically include in the study intentions that are considered the best predictor of behavior (Ajzen, 1991, Kolvereid, 1996; Krueger et al., 2000; Liñán et al., 2011b; Heuer et al., 2013)

Ajzen (1991, p. 181) defined intention as: “intentions are assumed to capture the motivational factors that influence a behavior; they are indication of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior”. In particular, EI could be defined as the conscious awareness that a person has to create a new venture and plan to do so in the future (Bird, 1988; Thompson, 2009). Krueger et al. (2000) consider intentions as the first step in starting up a new venture, and Liñán et al. (2006; 2007) says: as higher intention is, as higher the probability to the behavior to occur.

How to predict EI?

Today, empirical research in entrepreneurship on EI is common (Krueger, 1993; Kolvereid, 1996; Krueger et al., 2000; Autio et al., 2001; Peterman et al., 2003; Veciana et al., 2005; Liñán et al., 2009; 2011a; 2011b; just to mention a few). Over the years, it has had different approaches, all of them trying to answer why, how, what affects, when or where a person becomes an entrepreneur. Originally, the attention was centered in demographic factors. Those factors include age, gender, education, family and socioeconomic status, ethnic group, religion, and professional experience (Reynolds et al. 1994). Following Chell (1986; cited by Liñán et al., 2007), if we accept this kind of approaches, we are accepting that is not possible to learn to be an entrepreneur, and that is exactly what Krueger suggest (Krueger et al., 1994).

But now, the relevance of cognitive models is quite superior according to its supremacy in understanding the process (Liñán et al., 2014). When Bandura talked about the social-cognitive theory sowed the basis for the development of new approaches. (Liñán et al., 2007). The cognitive approach highlights the relevance of the influence of mental processes (motivation, perceptions or attitudes) in the decision-making process (Baron, 2004), in what is said and done (Krueger, 2003). In this sense, it has been emphasized by authors as Baron (2004), Krueger (2000), Mitchell et al. (2002) and Shaver et al. (1991), the relevance of cognitive processes in the formation of business decisions and actions of a person.

In fact, as it has been proved by Liñán et al. (2014), the explained variance in intention is higher in these models than in demographics approaches (50% vs 20%, respectively). Due to that, it seems to be clear the assumption of intention models that for intention turn into behavior, the effect of external variables (demographic or background characteristics) is not direct (Ajzen, 1991; Kolvereid, 1996).

Among the theories of behavioral intention, there are two whose robustness has long been proved. They are: the theory of the entrepreneurial event (EE) stated by Shapero and theory of planned behavior (TPB) by Ajzen.

In Shapero's theory the central aspects are perceptions, and assumes that people act in an inertial manner until an event occurs precipitating a change in behavior. This new behavior will be conditioned, on one hand, by what the individual believe are the alternatives, his desire (perceived desirability) and perceived viability (perceived feasibility), and on the other hand, his own propensity to act.

Finally, Shapero (cited by Krueger et al.1994) shows that the triggering event can be significant (job loss) or not ("getting old"). What has come to match the posed Gilad et al. (1986, cited by Segal et al., 2005) push-pull theory of entrepreneurial motivation.

In the second theory (TPB) the author (Ajzen, 1991), determine that entrepreneurial action can be predicted based on: 1) personal attitude 2) subjective norms, and 3) perceived behavioral control. In other words, the entrepreneurial behavior occurs when the individual's beliefs about their personal behavior (attitude), the degree of approval or disapproval of the initiative in their particular social context, and the difficulty perceived in their environment is configured in such a way that make them commit to their goal and lead them from the "mere" intention, to assume a specific behavior to meet the goals.

The application of TPB has always been consistent (Liñán et al., 2009; 2011c), and is the most widely used (Liñán et al., 2015). Nevertheless, sometimes, in practice, they are integrated by using perceived desirability and feasibility as substitutes for personal attitude and behavioral control (Liñán et al., 2015).

From this two combined theories Krueger et al. (1994) designed the entrepreneur potential model, EPM. Empirically this model has been tested by some authors as Crant (1996), Veciana et al. (2005) and Guerrero et al. (2008), and the critical constructs are 1) attractive perceived, formed by the variables: social norms (environmental impact) and attitudes (intrinsic personal interests or "awards"), 2) feasibility perceived, that matches Shapero's variable and PBC in Ajzen's model, and it is described as the ability to successfully solve a task (obstacles, personal skills and support), and 3) propensity to act, that would be the stable personality characteristics.

One key definition

The mental representations of the external environment surrounding the individual, captured through his senses and elaborated in his mind is a cognitive construct which is named perception. Perceptions may be different from person to person because 1) perceptions are subjective interpretations of reality, and therefore do not necessarily reflect objective circumstances (Arenius et al., 2005), 2) people can make judgment mistakes' when facing complex problems with incomplete information (Baron, 1998; Busenitz et al., 1997) or 3) they just handle different information.

Entrepreneurs may show lower risk levels or higher confidence in them when starting a business compared with other people's perceptions. In this sense, Krueger (2003) indicates that the perception of the existence of business opportunities could act as a trigger as it reinforces other individual perceptions in the formation of intentions. In contrary, Fernández et al. (2009) in his study concludes that there has not been observed that opportunities are a very important precedent, although the same authors suggest that this may be due to the sample was taken from the Global Entrepreneurship Monitor (not taking into account differences between countries).

In the same study, the authors divide perceptions 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 legitimation of entrepreneurship), concluding that individual perceptions (self-efficacy and role models in particular) are the most important antecedents (Fernández et al., 2009). Krueger (2000) found similar results.

2.2 Possible changes in Entrepreneurial Intentions

The TPB constructs' predict intention, but might have different relevance in doing it. Some studies found that SN is not significant (Autio et al., 2001; Krueger et al., 2000) or contributes very little in explaining EI (Liñán et al., 2009; Liñán et al., 2011a); even more, some of them simply omit it in the model applied (Krueger, 1993; Veciana et al., 2005). Others, that attitudes explain more EI than self-efficacy (Liñán et al., 2011a; 2013; Heuer et al., 2013); but when considering students, changes in PBC appear to be a relevant criteria (Fayole et al., 2006). In addition, Bandura's self-efficacy is quite similar to Ajzen's PBC, and to Shapero's perceived feasibility. The three of them refer to the perceived of capacity of entrepreneur behavior. Finally, Bandura argue that self-efficacy is task specific. According to this all, we are going to focus on ESE (entrepreneurial self-efficacy).

Why people with similar skills act differently?

People act differently when having similar skills because of their perceived self-efficacy; a concept that doesn't include the real level of the individual knowledge and developed skills (Milstein, 2005; cited by Naktiyok et. al., 2010). Self-efficacy represents a central mechanism of personal agency, is the belief in one's own capabilities to perform an action and to attain different outcomes (Bandura, 1977). Explain the difference in how people feel, think and act, and due to that, determine the behavior to be initiated, how much effort to be done, and how

long it will be sustained when facing obstacles and aversive experiences; determines motivational level (Bandura, 1977).

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; cited by Fernández et al., 2009). While outcome expectancies pertain to the perception of possible consequences of one's action, perceived self-efficacy refers to personal action control or agency.

An individual with high self-efficacy presents: 1) higher levels of achievement and choose to perform more challenging tasks (Bandura, 1977), 2) lower levels of risk aversion (Zhao et al., 2005, Liñán et al., 2009; 2013), 3) more intention (Bandura, 1977), and 4) when this self-efficacy is entrepreneurial self-efficacy (ESE), will show greater IE (Krueger et al., 1993).

Building self-efficacy?

Self-efficacy is malleable and can be influenced through four processes: (a) enactive mastery, (b) role modeling and vicarious experience, (c) social persuasion, and (d) judgments of one's own physiological states, such as arousal and anxiety (Bandura, 1977).

The GEM 2014 report indicates that the biggest difference among young people involved in entrepreneurial activities and others, is knowledge and skills to entrepreneur (Gullarte et al., 2014). It has been found that 1) knowledge exerts a strong influence on the formation of intention (Liñán, 2014), 2) EI is related to entrepreneurial behavior (Nabi et al., 2011), and 3) formal business education in early stages affects individual's attitudes, influencing the formation of their future career options and their propensity to become an entrepreneur (Arias et al., 2015). Moreover, it has been proved that educators may affect individuals EI (Segal et al., 2005). On the other hand, there are also studies prove that this relationship does not exist (Oosterbeek et al., 2010) or it is not a robust/ strong relation (Pittaway et al., 2007). Byabashaija et al. (2011) found that attitudes toward entrepreneurship as a career option changed with education, but they do not demonstrate that increases intention.

In this line, Toledano et al. (2008) concluded that training in entrepreneurship based on work experience in small business, does not contribute to encourage in the students all entrepreneurial attitudes; and Guerrero et al. (2008) add that the type of educational background affect the individuals' EI.

In terms of the type of relation, various studies found a positive relation among education and self-efficacy (Peterman et al., 2003; Zhao et al., 2005; Souitaris et al., 2007; Jones et al., 2008; Wilson et al., 2009; Von Graevenitz et al., 2010; Liñán et al., 2011a; Zhang et al., 2013; Soomro et al., 2015). Meanwhile, others found right the opposite as Cox et al. (2002), concluding that this probably happen because these students are exposed, during university years', to the complexity of the business world, which ends discouraging them. Another example is Walter et al., (2013) that found no positive relationship.

In line with those that found a positive relation, Wilson (2007, one of the most cited articles' in entrepreneurial intention according to Liñán et al., 2015) mention there is ample proof that individual's confidence about being able to successfully solve a task (self-efficacy) comes, or is formed, from "learning by doing", social perception and perception of ourselves. In particular, for enactive mastery experiences, business exercises and business case competition; for role models and vicarious experience, case studies of well known entrepreneurs and lectures given by local entrepreneurs. For social (verbal) persuasion, Bandura (1977) includes suggestion, in that sense professors can play an important role enhancing students' self-efficacy. Finally, formal education can provide examples of the lifestyles and working styles of successful entrepreneurs that will help individuals develop their own psychological coping strategies.

In regard to what happen in Spain, according to GUESSS report, the entrepreneurial intention level in Spain is the same as the calculated average from the 34 countries included in the study (Sieger et al., 2014). Additionally, "The White paper of entrepreneurship in Spain" (Alemany et al., 2011) conclude that Spaniard students believe they have not been trained to be entrepreneurs, not in concordance with statistical results of Lanero et al. (2011) that found a positive effect of education on EI in undergraduates students in Spain.

Gender matter?

Literature over gender is extent, even in this research field (Liñán et al., 2015) and it is known that gender has relation with intention. Some studies found a direct relation (Hatten et al., 1995; Wang et al., 2004; Zhao et al., 2005) while others an indirect relation (Shinnar et al., 2014; Wilson et al., 2007). Other findings reveal that females show lower EI (DeMartino et al., 2003; Zhao et al., 2005; Capstick et al., 2007; Linan et al., 2009; Joensuu et al., 2013; Sieger et al., 2014). Authors as Shinnar et al. (2014) and Wilson et al. (2007) confirm that women are particularly sensitive to education positive affecting self-efficacy, while men perceived self-efficacy seems unaffected. Meanwhile, Joensuu et al. (2013) concludes that

females not only have lower initial intentions, but also those intentions have decreased more over time.

In addition, Bandura (1992) found women tend to limit their career aspirations based on the gap of their perception and skills, and DeMarino et al., (2003) suggest that females tend to become entrepreneurs for family-related lifestyle reasons supporting the idea that the women choice is based on flexibility and work-family balance. Meanwhile, males would base their decisions on the possibility of wealth creation. According to the author, when women are married with dependent children the motivation is bigger, therefore those differences between males and females became larger (DeMarino et al., 2003). Observe this is not in contradiction with Bandura's words.

What about work experience?

Alsos et al., (2012) found that enterprise experience has indirect and positive effect on EI (proved for female subsample from secondary school). Liñán et al. (2014) found that work experience increase PBC and that increase is higher according to the time that the individual has been working, but EI remain the same. This result may be due to the type of work that reduces PA offsetting PBC. The results of Guerrero et al. (2008) show no differences in attitudes towards entrepreneurship between students who have work experience from those who don't.

Toledano et al., (2008) found work experience in small business does not have a positive impact on attitudes towards entrepreneurship (the perception of desirability and feasibility of entrepreneur) of students, even though they could demonstrate the relationship with EI. Two notes regarding these results: the first is that the work experience of the students was temporary summer jobs not related with their field of study, which may explain the first part of the results. Secondly, students mentioned as trigger EI from your work experience, the chance to be their own bosses probably based on the poor experience with their job bosses'.

What longitudinal studies say?

Entrepreneurship is dynamic (Krueger, 2000) and longitudinal studies are most useful in the understanding of the entrepreneurial process (Liñán et al., 2015). In a recent study, a systematic literature review on EI (Liñán et al., 2015), only 24 articles with longitudinal analysis were found over 409 in a ten years scope analysis. It's been found that those

studies generally focus their attention on measuring the efficiency of training. Additionally, the authors say that there is a notable lack of longitudinal long-term studies of EI.

With the intention not to carry out a systematic review, but to achieve a deeper knowledge about longitudinal studies in this field, we search for journal articles using “entrep*”, “intent*” (criteria used by Liñán et al., 2015 and Cornelius et al., 2006) and “Longitudinal” for article title, abstract and key words. No dates restriction used. As result, 57 articles were yielded. After the initial abstract analysis, papers that did not hit our target issue were discarded, reducing the list to 22 papers. Finally, three major topics were identified: 1) the link EI-behavior (EI into behavior), the most extended; 2) the analysis of education on EI (Educ Impact); and 3) other factors affecting EI stability. Table 1 presents the classification and relevant information.

Table 1. Literature Review: EI longitudinal studies. Own elaboration.

Author & year	Title	Journal	Sample, place & longitudinal scope	Findings	Category
(Kautonen et al., 2015)	Robustness of the theory of planned behavior in predicting entrepreneurial intentions and actions.	Entrepreneurship: Theory and Practice	Adult population (20–64 years of age) Austria and Finland 1 year	Age, gender, experience, education, and nature of entrepreneurial ambition don't affect the intention-behavior link.	EI into Behavior
(Van Gelderen, et al., 2015)	From entrepreneurial intentions to actions: Self-control and action-related doubt, fear, and aversion.	Journal of business venturing	Adult population (20–64 years of age) Finland 1 year	Self-control positively moderates the link intention-behavior. High level of self-control makes less likely that the person will experience high levels of any of the avoidance-oriented action-related emotions as fear, doubt, and aversion.	
(Hopp et al., 2014)	Understanding the dynamics of nascent entrepreneurship - Prestart-up experience, intentions, and entrepreneurial success.	Journal of Small Business Management	Entrepreneurs United States 5 years	Prestart-up experience and ability expectations have a positive effect on the number of new venture activities carried out.	
(Kibler et al., 2014)	Regional social legitimacy of entrepreneurship: Implications for entrepreneurial intention and start-up behaviour.	Regional studies	Adult population (20–64 years of age) Austria and Finland 1 year	EI and its impact behavior depend on the perceived regional social legitimacy of entrepreneurship.	
(Delanoë, 2013).	From intention to start-up: The effect of professional support.	Journal of small business and enterprise development	Adults France 1 year	Entrepreneurial support has a positive effect in turning EI into behavior.	
(Laguna, 2013)	Self-efficacy, self-esteem, and entrepreneurship among the unemployed	Journal of Applied Social Psychology	Adults Poland 1 year	Entrepreneurial SE, general SE, and global self-esteem beliefs are positively associated with EI. Entrepreneurial SE, general SE beliefs are predictors of EI. Antecedents of EI lose their predictive power for behavior.	
(Kautonen, 2013)	Predicting entrepreneurial behaviour: A test of the theory of planned behaviour.	Applied economics	Adult population (18–64 years of age) Finland 3 years	PA, SN and PBC are significant predictors of EI; and EI and PBC are significant predictors of behavior.	

Table 1. Cont.

Author & year	Title	Journal	Sample, place & longitudinal scope	Findings	Category
(Schoon et al., 2012)	Who becomes an entrepreneur? Early life experiences as predictors of entrepreneurship.	Developmental psychology	Adults 34 year old England 18 years	Females show lower levels of EI. Entrepreneurial behavior is associated with social skills and EI. For men, becoming an entrepreneur was predicted by having a self-employed father; for women, it was predicted by their parents' socioeconomic resources.	EI into Behavior
(Goethner et al., 2012)	Scientists' transition to academic entrepreneurship: Economic and psychological determinants.	Journal of economic psychology	Adults Germany 18 months	PA and PBC predict EI. SN has no effect on EI. Expected earnings and reputation, economic factors, human and social capital have indirect effects on EI through PA and PBC. Human and social capital also has a direct effect on EI. EI predict behavior.	
(Henley, 2007)	Entrepreneurial aspiration and transition into self-employment: Evidence from British longitudinal data	Entrepreneurship & regional development	Adult population (18–64 years of age) United Kingdom 5 years	The transitions into entrepreneur are not preceded by a statement of aspiration a year earlier.	
(Kolvereid et al., 2006)	New business start-up and subsequent entry into self-employment	Journal of Business Venturing	Nascent entrepreneurs Norwegian 1,5 years + 1 month	PA and SN predicts intention, and EI predicts behavior.	
(Liñán et al., 2011)	Temporal stability of entrepreneurial intentions: A longitudinal study.	Entrepreneurship Research in Europe: Evolving Concepts and Processes Entrepreneurship Research in Europe: Evolving Concepts and Processes	Last-year undergraduate students Spain 37 months	EI stability has not an important role in turning EI into behavior.	

Table 1. Cont.

Author & year	Title	Journal	Sample, place & longitudinal scope	Findings	Category
(Díaz-García et al., 2015)	Assessing the impact of the "Entrepreneurs" education programme on participants' entrepreneurial intentions.	RUSC : universities and knowledge society journal	Students Spain 6 months	The program increase SE levels and these levels had been maintained over time. Participants in the program show greater EI than non-participants, and it increased over time with regard to creativity.	Educ impact
(Gielnik et al., 2015)	Action and Action-Regulation in Entrepreneurship: Evaluating a Student Training for Promoting Entrepreneurship	Academy of Management Learning & Education *	EEP students Uganda 1 year	Education has a significant and positive impact on entrepreneurial behavior and entrepreneurial self-efficacy.	
(Roxas, 2014)	Effects of entrepreneurial knowledge on entrepreneurial intentions: A longitudinal study of selected South-east Asian business students	Journal of education and work	Students Philippine ND	"The findings underscore the importance of developing knowledge to nurture students' self-confidence and attitudinal propensity to engage in entrepreneurship."	
(Wang et al., 2011)	Generalist or specific studies for engineering entrepreneurs?: Comparison of French engineering students' trajectories in two different curricula.	Journal of small business and enterprise development	Students France 1 year	School culture and education have an important impact on commitment to an entrepreneurial career.	
(Byabashaija et al., 2011)	The impact of college entrepreneurial education on entrepreneurial attitudes and intention to start a business in Uganda.	Journal of Developmental Entrepreneurship	Students Uganda 4 months	Education increase attitudes toward entrepreneurship as a career of choice changed, but not EI.	
(Fayolle et al., 2006)	Assessing the impact of entrepreneurship education programmes: A new methodology	Journal of European industrial training	Students elective course France 1 day	"EEP had, in the short term, a strong, measurable impact on EI, while it had a positive, but not very significant, impact on PBC.	

* Note: Paper currently under review.

Table 1. Cont.

Author & year	Title	Journal	Sample, place & longitudinal scope	Findings	Category
(Kautonen et al., 2015)**	Robustness of the theory of planned behavior in predicting entrepreneurial intentions and actions.	Entrepreneurship: Theory and Practice	Adult population (20–64 years of age) Austria and Finland 1 year	PA, SN and PBC explain 59% of the variation in intention.	EI stability
(Joensuu et al., 2013)	Development of entrepreneurial intention in higher education and the effect of gender - a latent growth curve analysis	Education & training	Students Finland 2,5 years	Females show lower levels of EI. EI decrease with education and it's more pronounced in females. Initial level of EI does not condition future development of EI	
(Hirschi, 2013)	Career Decision Making, Stability, and Actualization of Career Intentions: The Case of Entrepreneurial Intentions	Journal of career assessment	Students Germany 6 months	High decidedness of career option combined with low exploration is related to stability of EI.	
(Liñán et al., 2011)**	Temporal stability of entrepreneurial intentions: A longitudinal study.	Entrepreneurship Research in Europe: Evolving Concepts and Processes Entrepreneurship Research in Europe: Evolving Concepts and Processes	Last-year undergraduate students Spain 37 months	The stability of perceptions (four TPB constructs) remains stable. Time of work experience and type of it would affect PBC and PA, but not EI.	
(Audet, 2004)	A longitudinal study of the entrepreneurial intentions of university students	Academy of Entrepreneurship Journal	Last-year undergraduate students Canada 1,5 years	The stability is confirmed, trough T-test.	

** Note: Paper cited in other category too.

Additionally, as preliminary study for future longitudinal analysis we found Soomro et al., (2015). In his study he is going to analyze individuals' attitudes and EI in developing countries. To end, none of the studies analyzed include student's academic performance as a variable affecting EI evolution. As it may be seen, the numbers of papers analyzing EI stability or evolution is quite low, as Liñán et al. (2015) confirm in his study.

Hypotheses

Based on the theory, and according to the main goal of this preliminary empirical approach (identify if the intention has changed over a period of three years) and the available data, we expect the following hypotheses to hold:

H1: Business Management education has a positive effect on undergraduates' student levels of EI.

H2: Undergraduates Business Management students with better academic performance (top marks in the specific training in entrepreneurship and its corresponding practice) show more IE.

H3: Female EI is lower than male students in all stages (courses) of the formal education, Business Management degree.

H4: Working experience has a negative effect on EI levels of Business Management undergraduates' students.

3. Empirical analysis

3.1 Sample selection

The selection of the sample in this field may be a controversy issue. According to GUESSS report, "students represent the entrepreneurs of tomorrow; their entrepreneurial plans and activities will shape tomorrow's societies and the overall economic well-being" (Sieger et al., 2014, p. 5), and some researchers, like e.g. Krueger (1993), has defended the adequacy of student samples.

But, it would be possible that their responses will differ from an adult (Liñán et al., 2014). Likewise, University graduates, aged between 25 and 34 years old, are considered to be the population segment most likely to become entrepreneurs

(Reynolds et al., 2002; Liñán et al., 2014) and many studies about EI use students' samples, students in the final year in particular (Autio et al., 2001; Krueger et al., 2000; Fayolle et al., 2006; Veciana, et al., 2005; Liñán et al., 2011b; 2011c; 2013).

A sample of undergraduate students for Business Management in Barcelona has been used. This educational profile was chosen because 1) after graduation is more difficult to change individuals' self-image, which has been formed at earlier age, and it is quite relevant for the effect of PA over EI (Liñán et al., 2009), and 2) entrepreneurship related majors students (Business Administration and Economics) show higher feasibility perception than others (Guerrero et al., 2008).

Attending to the city selection, according to the INE (Instituto Nacional de Estadística) 2014 report, Catalunya, with an enterprises stock over 640.000, in 2012, it has been the region who presented the second worst rate net variation¹, after Mellila, even still above Spanish average in terms of creation. On the other hand, in 2014, according to the 2014 Global Entrepreneur Monitor's - GEM – report, in terms of abandonment of business activity level, Catalonia is in a better position in comparison to the rest of Spain, showing a decrease in the abandonment of activity by decommissioning, from 1,4% to 0,7% and an increase because of transfer or sale. In this regard, Barcelona has a similar behavior. The number of activity by decommissioning for the whole of Spain has remained around 1,4% (Guallarte et al., 2014).

In addition, the report indicates Catalunya and Barcelona show higher percentages (68% and 70% respectively) than Spain and Europe of entrepreneurship by opportunity (than necessity), which leads further to think about college students to along all his training as a focus of attention; and finally because this region presents favorable attitudes towards entrepreneurship (Guerrero et al., 2008; Veciana et al., 2005).

3.2 Sample description and data collection

Sample was taken for undergraduates of Business Management from 1st and 3rd year in a private university of Barcelona. The data used for this study was collected for a different goal and due to that is quite restricted, but enough for our actual propose. Three waves were collected for longitudinal analysis. Time 1 (T1) is October 2012, time 2 (T2) March 2015 and time 3 (T3) June 2015. The intervals go from 4 months (T2 to T3) to 32 (T1 to T3). The wider interval is similar to the one used by Liñán et al. (2014).

¹ Net variation :the difference between creation and closure of companies.

No missing data registered, but for one case of T2. The information was corrected with information from T1 and T3 since it was exactly the same in both questionnaires.

T1 survey was administered to students newly admitted to the university in paper format, coinciding with their first week of classes. T2 was the beginning of the second semester of 3rd course year and the questionnaire was administered in virtual format through the SurveyMonkey software available online. Same as in T3, coinciding with the last week of classes for the same semester, in June 2015.

The total sample size was 220 students (126 T1 and 94 T2 and 3), getting a 64% response rate (141). The 32.5% (41 replies) of the students from T1 responded, 48.9% (46 replies) in T2 and 56.4% (53 replies) in T3. Poor rate when compared with Liñán et al. (2011) but really high when compared with those obtained by GUESSS whose maximum ratio is 33% for Liechtenstein in the report submitted in 2014 (Sieger et al., 2014) or the 43% from the study of DeMarino et al. (2003)

We first read all the paper based questionnaires and we search for the virtually based questionnaires from T2 and T3. Then we decide the criteria to typify the answers on Excel software and we get the samples described in Table 2.

Table 2. Sample description

	Women	Educational level (course)	Work experience
T1	29%	1º	22,6%
T2	32,6%	3º	54,3%
T3	28,3%	3º	54,7%

For the longitudinal analysis, we matched each sample to dismiss all the individuals that may answer just one of the questionnaires. Matches rates found are:

T1-T2 → 27 matches = 65,9%

T1-T3 → 39 matches = 95,1%

T2-T3 → 31 matches = 67,4%

As you can see, the percentage of individuals who answer in T1 and T3 is the highest, surpassing other studies, as the Liñán et al. (2011a) which reaches 33,04% using a similar period to the one used in this study. The same situation for Audet (2004) getting a 35.3% for a study with the half time lapse, or achieved by Souitaris et al. (2007)

which reaches a 55.3% at a 5-month study with surveys administered in class in both waves. Finally, we matched the three samples getting a total of 26 individuals responding in T1, T2 and T3. For this preliminary study purpose we will use T1-T3 comparison, 39 individuals from each subsample, bigger than samples used in other studies, e.g. Fayolle et al. (2006) in his longitudinal study use a sample with 20 individuals.

3.3 Measures

The survey is divided into 4 sections: voluntary identification of the student (to be able to follow up), education, intention and general self-perception. For surveys administered in T2 and T3 for the last section were added: skills and SE. The items included in each section have been evaluated using a 5-level Likert scale (1: totally disagree to 5: totally agree), an ordinal of 4 levels and, when necessary, dichotomous responses or nominal variables have been used.

In education section, the survey asked about the reasons why they have chosen Business Management as academic discipline. It is an open not structured question. This design search for avoidance of conditioned responses, as is done in other questions, fundamentally in those administrated in T1. Responses were classified according to Liñán et al. (2011b) who used a 3-item response on a 7-point Likert scale (1: not important to 7: very important). The classifications are: vocation, opportunities and advice of parents and friends. In our case, none of the students openly answered the 3rd option, so it has turn into a dichotomous variable at end.

Regarding to the second section, intention, we wanted to know which career path do they plan to follow directly after completion of their studies, and their long-term career plan (5 and 10 years); coinciding with one of the central questions of GUESSS (Sieger et al., 2014). We asked open questions to avoid the potential weakness when asked for a "black or white" decision; that means people who think about becoming an entrepreneur at some point in the future may prefer to choose other answer option (Sieger et al., 2014). Finally, we ask "how do you see yourself in .. years?".

Armitage et al., (2001) identified three types of measures: desire (I want...), self-prediction (how likely it is...) and behavioral intention (I intend to...), and found the latter yields the best results in behavioral prediction. Following this author, we would be asking about a measure of the third category: behavioral intention. From these responses we identify: additional formal education after graduation, entrepreneur and family business as career choice in a 10 years' time frame maximum. According to the

definition of entrepreneurship (or entrepreneurial behavior) as career orientation, mindset and behavior toward starting up a business (Nabi et al., 2006; 2011; Liñán et al., 2011a), we do not consider going into family business as entrepreneurship.

After checking 1st wave responses, in the 2nd and 3rd wave, intention was measured from a multiple choice question where students could choose several alternatives, some of them matching with those asked for GUESSS (Sieger et al, 2014). The main categories were: working for others' companies (employee), entrepreneurship/founder (national and international), continuing family business (successor) and additional education.

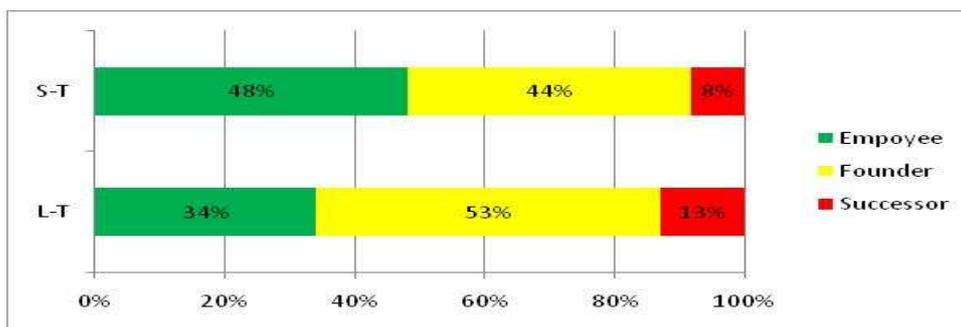
General self-perception section ask for a general personal valuation regarding the ideal of "being a good professional/achieving your goals". A kind of personal mini SWOT with qualitative answers. For T2 and T3, this section includes the personal assessment of a wide group of competencies linked to managing business that are part of the teaching programs of Business Management degree, some of which coincide with the entrepreneurial skills used by Liñán (2008). The skills are: creativity, conflict management, leadership and communication skills; in our case divided into writing and oral. Likewise, include tolerance to pressure, autonomy, and planning, the latest being one of the elements that play an important role in shaping the personal decision to start a company (Liñán et al., 2011b). The information gathered in the section of general self-perception will be used in upcoming developments.

We dispose as control variables some demographic information such as: gender, educational level and work status. Additionally, we have information about their academic performance of course at T3. The statistical analysis was made using SPSS software.

3.4 Results and discussion

In a first general data analyses we compare with GUESSS results, because this report has the most descriptive information among all the papers analyzed. We check the different types of career path in T3 as: "Employee", "Founder", and "Successor" (Sieger et al., 2014).

Graphic 1: T3 Career choice intention (general sample). Own elaboration.



Graphic 2: GUESSS' report career choice intention (general sample).

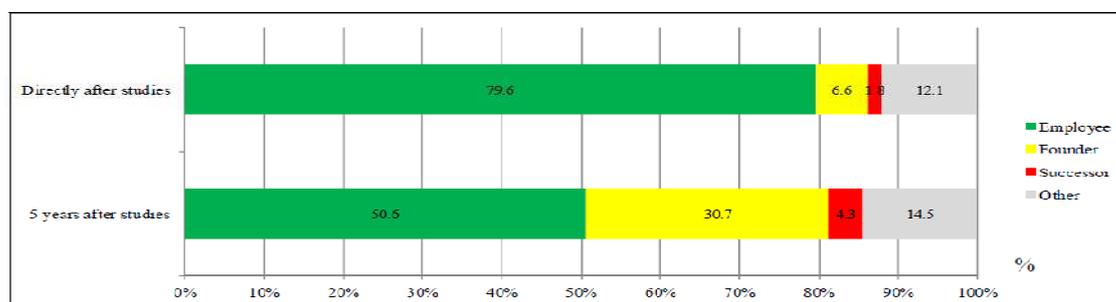


Figure 12: Shift in career groups on the global level

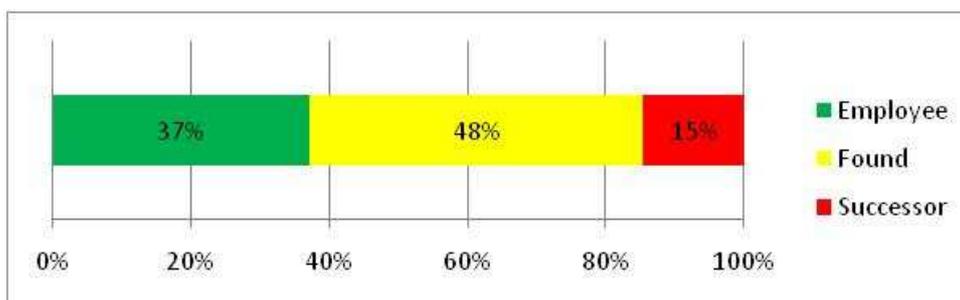
Source: Sieger et al. 2014

As the graphics show, the bigger group found by Sieger et al. (2014) is the one with “employee” intention as a career path, in both, directly after the studies and 5 years after. In our study, we found a big group willing to become entrepreneurs; increasing the group for long term expectative as it occur with GUESSS data. The differences may be due to the sample selection. GUESSS has a 22 year old average sample, but they include from undergraduates to MBA or postdoc students, from different academic disciplines and from 34 countries, meanwhile we dispose information for 53 (T3) Business Management undergraduate students from a private university.

The group showing entrepreneurial intentions directly after graduation is really big compared with GUESSS data: 44% of the sample versus 25% of Argentina sample, the biggest groups of GUESSS with this career choice. In long term, the group size is like Russia (53%), after Mexico, Argentina and Colombia. In Spain, from the whole sample, a 32%, and 39% from the business, economics and law students’ subsample (Sieger et al., 2014).

For T1, we can’t discriminate between short and long term. The results are in graphic 3.

Graphic 3: T1 Career choice intention (general sample). Own elaboration.



GUESSS report made an EI comparison over time, finding a decrease of these intentions and that are not as strong in 2013/2014 as in 2011. They expose that one reason could be the worst economic context in 2011 and, because of that, entrepreneurship due to necessity reasons. Unfortunately the two samples differ in terms of participating countries and participating universities, and GUESSS report does not include statistical analysis.

To our end, we follow Liñán et al. (2014), and we define stability measure as the correlation of participant and scale items at T1 and T3, and only in those cases when the correlation was positive and significantly different from zero we accept that the construct has remained stable. We found no stability in 1) the will of additional formal education after graduation, 2) the consideration of family business as a career option (successor) and 3) and to become an entrepreneur as a career option (founder), too.

Table 2: Pearson correlation matrix

	<i>Ad Educ 1</i>	<i>Successor 1</i>	<i>Founder 1</i>
<i>Ad Educ 3</i>	-0,089	-0,243	-0,299
<i>Successor 3</i>	0,068	-0,104	-0,267
<i>Founder 3</i>	0,356	-0,020	-0,051

Then, the independent sample t-test (table 3) was used to compare changes in those variables (Audet, 2004; Wang et al, 2011; Liñán et al., 2014). Only family business as a career option was not significant. Changes in EI were significant at $p < 0,1$, and positives, confirming **H1**, meaning that Business Management education has a positive effect on undergraduates' student levels of EI. The same happen with the will of additional formal education.

Positive changes in EI could confirm the positive relation between education and self-efficacy as found by many authors (e.g. Zhao et al., 2005; Wilson et al., 2007; Shinnar et al., 2014), contrary to the findings of Joensuu et al. (2013) in his longitudinal analysis. In regarding additional education, results could confirm the idea of reinforcement self-efficacy (and its impact on EI) as a generalized perception, for example.

We use t-test to compare differences in career option between those who had chosen Business Management due to vocation from those who did it for opportunities. We found significant differences for EI in the large (T1+T3) sample (table 4), and just in the T1 subsample both at $p < 0,01$. This may be due to the different decision process stages of the responders about future expectations in T1. According to Hirschi (2013) EI stability relies on career options decision making maturity. In this sense, the reasons for studying Business Management were clear at the beginning of the program and there may not be the case for career options. We use Pearson to check the relation between those variables and we found significant correlation in the large sample ($p < 0,01$), but contrary to what expected, there is significant high correlation in T1 ($p < 0,01$) and no significant in T3. That would mean that reasons for choosing this educational orientation don't explain career option intentions'.

Table 3: Career path changing's. Mean comparison for independent samples

Prueba de muestras independientes

		Prueba de Levene de igualdad de varianzas		prueba t para la igualdad de medias						
		F	Sig.	t	Gl	Sig. (bilateral)	Diferencia de medias	Diferencia de error estándar	95% de intervalo de confianza de la diferencia	
									Inferior	Superior
<i>Founder</i> 13	Se asumen varianzas iguales	3,822	,056	-1,698	50	,096	-,231	,136	-,504	,042
	No se asumen varianzas iguales			-1,698	49,706	,096	-,231	,136	-,504	,042
<i>Ad Educ</i> 13	Se asumen varianzas iguales	,315	,577	-1,978	50	,053	-,269	,136	-,543	,004
	No se asumen varianzas iguales			-1,978	49,975	,053	-,269	,136	-,543	,004
<i>Succe</i> 13	Se asumen varianzas iguales	,868	,356	,462	50	,646	,038	,083	-,129	,206
	No se asumen varianzas iguales			,462	48,439	,646	,038	,083	-,129	,206

We repeat t-test for analyzing the effect of academic performance on EI, but no differences were found (table 5). We can't accept **H2** concluding that academic

performance could not appear to be an influence of career option. Of course, because of the size of our sample, this shouldn't be generalized and more research is needed.

In relation to gender, a general overview and comparison with GUESSS data is made (graphics 4 and 5). The differences for gender reasons in percentile points are almost the same in both samples (0,7 points bigger difference in "Employee" intention and entrepreneurial intention).

Table 4: Differences in career options due to "reasons for choosing" Business Management. Large sample. Mean comparison for independent samples

Prueba de muestras independientes

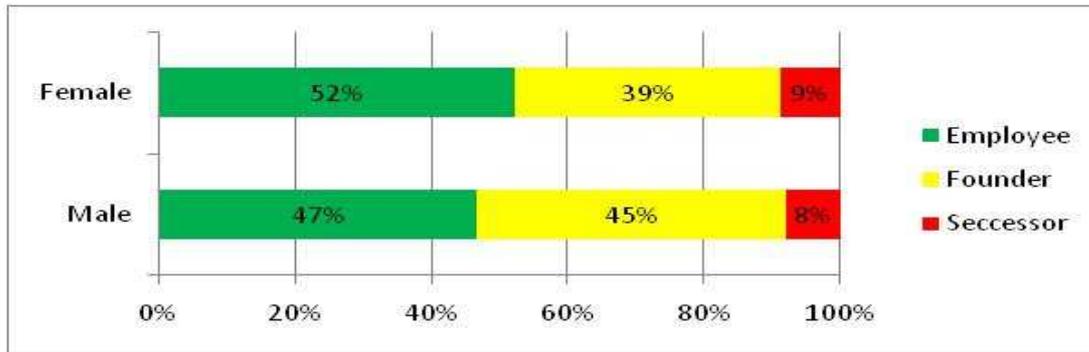
		Prueba de Levene de igualdad de varianzas		prueba t para la igualdad de medias						
		F	Sig.	t	gl	Sig. (bilateral)	Diferencia de medias	Diferencia de error estándar	95% de intervalo de confianza de la diferencia	
									Inferior	Superior
<i>Founder</i> 13	Se asumen varianzas iguales	,199	,657	3,085	50	,003	,436	,141	,152	,720
	No se asumen varianzas iguales			3,101	26,285	,005	,436	,141	,147	,725
<i>Ad Educ</i> 13	Se asumen varianzas iguales	1,365	,248	-,732	50	,468	-,114	,155	-,425	,198
	No se asumen varianzas iguales			-,731	25,973	,471	-,114	,155	-,433	,205
<i>Successor</i> 13	Se asumen varianzas iguales	1,254	,268	-,570	50	,571	-,052	,092	-,236	,132
	No se asumen varianzas iguales			-,514	21,378	,612	-,052	,102	-,263	,159

Table 5: Differences in EI due to "academic performance". Mean comparison for independent samples

Prueba de muestras independientes

		Prueba de Levene de igualdad de varianzas		prueba t para la igualdad de medias						
		F	Sig.	t	gl	Sig. (bilateral)	Diferencia de medias	Diferencia de error estándar	95% de intervalo de confianza de la diferencia	
									Inferior	Superior
<i>Founder</i> 3	Se asumen varianzas iguales	3,773	,064	,563	24	,579	,29694	,52759	-,79195	1,38584
	No se asumen varianzas iguales			,478	9,780	,643	,29694	,62062	-1,09013	1,68402

Graphic 4: T3 Career choice intention: females vs males. Own elaboration.



Graphic 5: T3 Career choice intention: females vs males. BECL² sample.

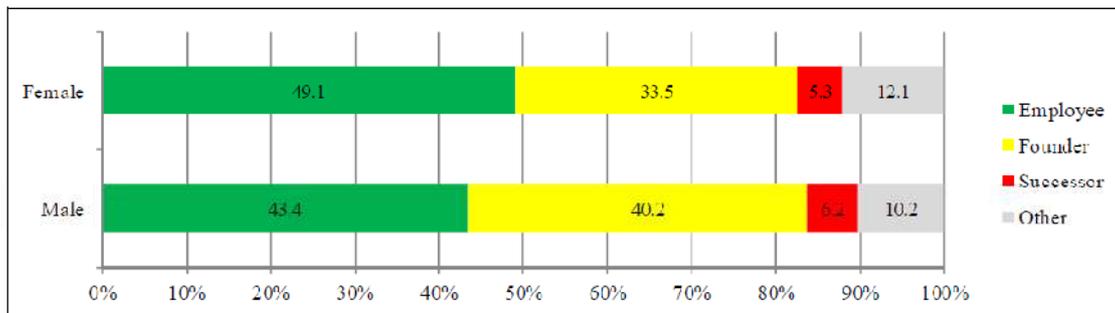


Figure 22: Career choice intentions of male and female BECL students 5 years after study

Source: Sieger et al. 2014

Additionally, we checked the correlation and we find high correlation of gender with reasons for choosing Business Management and EI in both, T1 and T3, but according to t-test results we couldn't find differences for gender reasons. So, we don't accept **H3**, and the same observations for H2 are made. Furthermore, this could be due to the matched sample size and composition. In our case around 35% were females. DeMarino et al. (2003) found lower EI levels in females with a sample with a 29% of them, but they were professionals with as much as 20 years of experience. Other studies found the same, but the samples widely differ from ours, e.g. Zhao et al. (2005) 44% females MBA students, Liñán et al. (2009) 53.5% were female last year university students, and Capstick et al. (2007) and Joensuu et al. (2013) with undergraduates students, 21-23 years old average, had 60% of females in their samples.

As expected, there has been a significant change in the variable work status in a T1-T3 comparison. Additionally, we found differences between the two working status subsamples in regard their will to work in the family business ($p < 0,01$), but just in T1.

² BECL: business, economics and law students.

Regrettably, with the data collected we are unable to identify possible causes. One possible reason could be that everyone who works is working in the family business and therefore consider it a career option or those who work are those who have no family business and therefore they can't consider it as such. We check the differences in EI in regard to working status with t-test too, but no differences were found. These results are in line with Guerrero et al. (2008), Liñán et al. (2014) and Alsos et al. (2013). Thus, we can't accept **H4**.

4. Conclusion, limitations and practical implications and future research

4.1 Conclusion

In 2011, Liñán start the conclusion of his conference this way: "As far as we are aware, this is probably the first long-term longitudinal study analyzing the temporal stability of entrepreneurial intention" (Liñán et al., 2011a). The present study, as far as we know, probably is the first long-term longitudinal study analyzing the temporal stability of entrepreneurial intention in undergraduate students.

The main objective of this study was confirm EI changes during formal educational program years, in order to justify a deeper analysis of the evolution of EI in undergraduate students and, in particular, the effect of education on it. For doing so, a preliminary empirical approach was carried out.

A three waves sample was taken from undergraduates of Business Management from 1st and 3rd year in a private university of Barcelona. The larger interval was 32 month, similar to the one used by Liñán et al., (2011a) in an analogous study.

Findings confirm the instability of EI and its positive relationship with education. No differences were found in EI regarding academic performance. Additionally, results don't allow us to confirm significant difference in EI level regarding to gender. Lastly, and according to the findings of Liñán et al. (2011a), no differences were found for work experience reasons on EI. To sum up, this study provides enough evidence to go further in the analysis of EI stability. The results confirm the need for more research in this issue.

As Liñán said: "there is still much to be learned to really understand the mental processes leading to the start-up decision" (Liñán et al., 2011a, p.13) and with this study we contribute to this end.

4.2 Limitations

Limitations of this study are associated with the sample. We use data that was collected in just one private university; future research should try to avoid e.g. school culture effects (Wang et al., 2011) on EI using data from more than one university. An additional limitation is the sample size that is not sufficiently large to ensure adequate representativeness of results.

4.3 Practical implications and future research

For researchers, a new branch of study has been opened. It is necessary to extend the field study, expanding the center of attention on the impact of education on EI, including the understanding of what happens during those years of education. There are many things to explain regarding the factors affecting EI evolution over time. Future research should focus in determining the impact of education on all the TPB model constructs', its effect on EI stability in undergraduates' students, and even more, in identifying what are the educational factors' affecting it. Other focus of attention for researchers should be in determining the role of academic performance on EI antecedents. Another point of interest is to determine if demographic characteristics of class groups could explain any difference between them and, in particular, in female EI levels and development.

For educators, knowing that our behavior, as closer valuation e.g., affects the way in which EI evolves during the years of education could makes us aware, and give us the opportunity of having this issue into account when designing the programs and in the teacher-student relationship.

For policy makers, by knowing the factors affecting EI stability, could design programs and foresee budgets, e.g. programs to bring/show the institutional support for entrepreneurship to students, etc.

Acknowledgements and dedication

This thesis is dedicated to my family who has been an invaluable support, to my students without which never would have raised me these concerns and, of course, teachers of the MSc in Business Research of the Universitat de Barcelona for the contributions. A special mention to PhD. Paloma Miravittles, to PhD. Esther Hormiga, and to my tutor, PhD. Jaume Valls.

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Declaración de Originalidad y Ausencia de Plagio/Ciberplagio

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