



ENTREPRENEURIAL ATTITUDES AND MOTIVATIONS IN CHILDREN: EXPLORATORY STUDY

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summary

Conventional wisdom suggests that acquiring entrepreneurial attitudes and motivations early in life tends to have a positive influence on future entrepreneurial behavior. Despite such a widespread argument, there is very little scientific evidence to support this claim. The objective of this study is to understand what are the main attitudes and motivations of children today, to evaluate how these attitudes and motivations are related to other relevant variables, that is, gender, age, education, vocations and aspirations of children and occupations of parents and assessing the influence of education on children's attitudes and motivations. To achieve this goal, we gathered primary data from children using an adaptation of the Entrepreneurial Attitude Survey. Four classes from the 3rd and 4th year of a college in Porto were studied with a pro-entrepreneur context and the study was centered on children. Exploratory and econometric analyzes show that different determinants have different impacts on children's entrepreneurial attitudes - achievement, innovation, self-control and self-esteem. In general, children enrolled in the 3rd year have higher levels of entrepreneurial attitudes than those enrolled in the 4th year, except for innovation. These results seem to convey the idea that, with the progression of individuals in their school career, they lose part of their entrepreneurial attitudes. Although this result should be carefully analyzed, given the limited number of children involved and the specific context of the study,

Key words: education, entrepreneurship, children, attitudes, motivations

1. Introduction

Entrepreneurship is commonly associated with economic growth (Holcombe, 1998; Wennekers and Thurik, 1999), which is positively associated with the development of societies (Nooteboom, 1993; Wennekers and Thurik, 1999; Acs, 2006; Acs and Almorós, 2008; GEM, 2013). In fact, several researchers argue that entrepreneurship resides "at the heart of competitive advantage" (Porter, 1990: 125), playing a key role in promoting economic growth. Wong et al. (2005: 337) state that "[e] entrepreneurs serve as agents of change, bring new ideas to the markets and stimulate growth through a process of selecting competitive companies". Like this,

In this context, the "production" of such entrepreneurs has been central, both in fields related to politics (EUE, 2006) and in the scientific context, mainly in the literature on education for entrepreneurship (Kourilsky, 1980; Fiet, 2000; Rasheed and Rasheed, 2003; Löbler, 2006; Oosterbeek et al., 2010; Johansen and Clausen, 2011).

The spirit of initiative and entrepreneurship are one of the eight competences identified in the European framework of essential competences (EC, 2012). It is suggested that entrepreneurial attitudes and motivations can be improved and that this active learning begins to happen at a very early stage in the child's life (Löbler, 2006). The evidence collected by Lindström (2013) points out that children are able to actively learn from preschool ages and that entrepreneurial behavior can be developed from an early age. In particular, the author states that children develop skills such as curiosity, imagination, awareness of their talents, the ability to see the

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possibilities, the motivation to learn, to have initiative, creativity, leadership, to have and to assume responsibility.

Although many authors (eg, Hegarty and Jones, 2008; Oosterbeek et al., 2010) have studied the teaching of entrepreneurship in universities, less (eg, Aşici and Aslan, 2010; Johansen and Clausen, 2011) have studied in secondary schools, and even less studied in primary schools (Aslan, 2010; Do Paço and Palinhas, 2011) or pre-school education (Lindström, 2013). Regarding primary children, the focus of Do Paço and Palinhas (2011) was on entrepreneurial programs, while Aslan (2010) sought to analyze the perspective of children and teachers regarding entrepreneurship.

To the best of our knowledge, no published study has focused on children's entrepreneurial attitudes and motivations and the extent to which schools can improve their entrepreneurial potential.

Given the importance that the acquired skills have in future entrepreneurial behavior, it would be enlightening to analyze this issue to overcome this gap in the literature. Thus, our main research question is: "What are the main entrepreneurial attitudes and motivations of children enrolled in primary school through their own eyes?"

To achieve this objective, students from two classes of the 3rd and 4th year of a private school located in Porto (Portugal) were selected. This college is known for having a different way of teaching in order for its students to become critical thinkers, confident leaders, expert communicators and efficient problem solvers. To assess entrepreneurial attitudes and motivations, a questionnaire adapted from the Entrepreneurial Attitude Orientation Questionnaire (EAO) was implemented. Then, using econometric tools (logistics) we evaluate the determinants of each group of entrepreneurial attitudes (achievement, innovation, self-control and self-esteem).

The present work begins (section 2), with a contextualization of the state of the art. Then, in section 3, the objectives and how the study was implemented are explained. Section 4 presents the results of the empirical analysis. Finally, the conclusions present the main contributions of the present study, highlighting its limitations and the way for future research.

2. Literature review

2.1 Entrepreneurship and entrepreneurial attitudes

An entrepreneur is an individual who must combine various talents, whether these are innate or acquired through education, acculturation or other means, as well as being a teacher of the talent of others, that is, he must bring together and maintain teams of individuals who work synergistically (Lazear, 2005). There are several characteristics that can be found in an entrepreneur, namely: achievement; (Robinson et al., 1991) need to take and take risks (Do Paço and Palinhas, 2011); innovation (Robinson et al., 1991; Rasheed and Rasheed, 2003); creativity (Do Paço and Palinhas, 2011; Johansen and Clausen, 2011; Lindström, 2013); self-control (Robinson et al., 1991; Rasheed and Rasheed, 2003; Do Paço and Palinhas, 2011); not losing faith in being successful (Aşici and Aslan, 2010); self-esteem (Robinson et al., 1991; Rasheed and Rasheed, 2003; Do Paço and Palinhas, 2011); enjoy working (Aşici and Aslan, 2010); be willing to learn something continuously (Aşici and Aslan, 2010); love problem solving, and dedicate yourself to your work (Aslan, 2010).

Some of these characteristics can be improved (or decreased) by factors such as gender (Johansen and Clausen, 2011; Schoon and Duckworth, 2012; Geldhof et al., 2014), ethnicity (Torimiro and Dionco-Adetayo, 2005; Arcand, 2012), age (Schwarz et al., 2009; Staniewski and Szopinski, 2013; Sepúlveda and Bonilla, 2014), models of behavior (Van Auken et al., 2006; Johansen and Clausen, 2011; Chlosta et al., 2012; Bosma et al., 2012; Lafuente and Vaillant, 2013), education level (Kourilsky, 1980; Johansen and Clausen, 2011; Greene et al., 2013), and

access to entrepreneurial education (Kourilsky and Walstad, 1998; Fiet, 2000; Rasheed and Rasheed, 2003; Johansen and Clausen, 2011).

According to Hegarty and Jones (2008), entrepreneurial attitudes enable students to be more prepared for the real and competitive world. Following the Entrepreneurial Attitudes Orientation Scale (Robinson et al., 1991), entrepreneurial attitudes generally include four main items: achievement, innovation, self-control and self-esteem.

Achievement(Robinson et al., 1991) means striving for excellence and is almost synonymous with entrepreneurship or entrepreneur. It is directly linked to results (Robinson et al., 1991), doing something faster and better than others or yourself in the past (Hansemark, 1998). Achievement and the need for achievement are often related to attitudes, such as: dedicating yourself to your work (Aslan, 2010); be competitive or assertive (Aşici and Aslan 2010); need to take and take risks (Do Paço and Palinhas, 2011); motivation (Rasheed and Rasheed, 2003; Lindström, 2013) and motivation to learn (Löbler, 2006; Lindström, 2013).

Innovation(Robinson et al., 1991; Rasheed and Rasheed, 2003) is defined as the creation of something new and / or in a unique way (Robinson et al., 1991). Entrepreneurs have higher levels of innovation than the rest of the population (Rasheed and Rasheed, 2003). Innovation is closely linked to creativity (Do Paço and Palinhas, 2011; Johansen and Clausen, 2011; Lindström, 2013) and both are linked to planning something in the mind continuously (Aslan, 2010); problem solving in new and different ways (Aslan, 2010); to love problem solving (Aslan, 2010); being curious (Aslan, 2010); having a lot of imagination (Aslan, 2010); having a questioning personality (Aşici and Aslan, 2010); be willing to learn something continuously (Aşici and Aslan, 2010); have a spirit of initiative (Johansen and Clausen,

Self-control(Robinson et al, 1991; Rasheed and Rasheed, 2003; Do Paço and Palinhas, 2011) is related to the way people deal with emotions during the execution of tasks (Rasheed and Rasheed, 2003). Entrepreneurs have superior self-control because they believe that actions are influenced by their own efforts (Robinson et al., 1991; Rasheed and Rasheed, 2003). Attitudes such as: not losing faith in being successful (Aşici and Aslan, 2010); not losing faith in success and reward, even when you are not successful (Aşici and Aslan, 2010) or resisting failure (Do Paço and Palinhas, 2011); improve yourself after completing tasks (Aşici and Aslan, 2010); not giving in quickly (Aşici and Aslan, 2010); have cooperation skills (Johansen and Clausen, 2011); develop self-confidence and self-responsibility (Lindström,

Finally, self-esteem (Robinson et al., 1991; Rasheed and Rasheed, 2003; Do Paço and Palinhas, 2011) concerns the way people feel about their own skills and abilities (Robinson et al., 1991). Entrepreneurs have higher self-esteem than other individuals (Rasheed and Rasheed, 2003). This aspect is related to self-confidence (Aslan, 2010); enjoy working (Aşici and Aslan, 2010) and confidence (Do Paço and Palinhas, 2011).

2.2 Children and entrepreneurial attitudes and motivations

Children are very interesting human beings, in general, they are willing to learn, they are very curious, willing to take risks, creative and committed. Picasso said that "every child is an artist. The problem is how to remain an artist after growing up". Thus, it is very interesting to note that the skills and attitudes found in children appear to be very similar to those that define entrepreneurs. We could then induce that everyone could potentially be an entrepreneur in the future, since everyone was a child in the past. However, the reality is quite different. We can therefore infer from this, as underlined by Löbler (2006) and from the quote by Picasso, that there is a decrease in these competences, attitudes and motivations as time goes by.

If children are such interesting human beings, how does the system fail? And why do these attitudes decrease over time?

Albert Einstein stated that "the real sign of intelligence is not knowledge, but imagination". Sir Ken Robinson, most likely, is in agreement with Einstein, in one of the most famous Ted Talks on education, stated that children have great talents; however, education takes away their creativity. Creativity, according to Robinson, should be just as important as literacy in schools. He also stated that to be creative you cannot be afraid of being wrong, or else giving a different type of response will never be an option. When children grow up to be adults, most of them are afraid of being wrong and lose that ability to be creative. "[O]ur education system has undermined our minds in the same way that we undermine the land for a given commodity. And for the future, it will not serve us. We have to rethink the fundamental principles on which we are educating our children" (Sir Ken Robinson, TED Talk, 2006).

There are several ways to touch children's attitudes and motivations. However, as Nelson Mandela said, "education is the most powerful weapon you can use to change the world". Entrepreneurial education therefore assumes an important role in changing attitudes and motivations (Sun and Lo, 2012), as it develops tools for individuals to come up with solutions on their own, rather than providing guidance for problem solving, which comes in same line of reasoning as Robinson or Einstein.

Entrepreneurial education should focus on an experimental approach, as it is said to be more effective than the conventional classroom approach during the development of future entrepreneurial behavior (Do Paço and Palinhas, 2011; Baden and Parkes, 2013). In fact, it is not mandatory that entrepreneurial education be transferred only in a classroom setting and "learning by doing" thus plays an important role. Entrepreneurial skills and attitudes, especially at younger ages, can also be transferred informally by game (Löbler, 2006), as students increase their skills and actively work on their attitudes in an unreflective way in order to achieve the goals of their students. games / competitions.

It is therefore essential that courses are adapted and personalized (Hegarty and Jones, 2008; Aşici and Aslan, 2010), depending on several variables, namely the target population, which means that there must be different curricula for different ages. The transmission of knowledge must be a personalized experience, built in a learning-oriented way as an alternative to the typical form of teaching (Löbler 2006), since it is a reality where "guides" or "rules" do not work, because it is characterized by diversity and change (Löbler, 2006), therefore requiring customization, or in other words, being student-centered (Hegarty and Jones, 2008). The student-centered approach will have a better response to current and future attitudes and motivations.

A generalized view is that the effort to reinforce entrepreneurial skills, attitudes and motivations occurring only late in life, will produce results with little or no effect. In fact, some authors (eg, Rasheed and Rasheed, 2003) claim that the educational system should be encouraged to invest in entrepreneurial training, with the aim of developing and fostering entrepreneurship at an early age.

According to Löbler (2006), the sooner children start to come into contact with entrepreneurship, the greater the chances of entrepreneurship being reinforced. However, the literature is not very explicit as to when this should happen in children's lives. Schoon and Duckworth (2012), state that social skills and entrepreneurial intentions are expressed by the age of 16. The literature also suggests that attitudes related to entrepreneurship decrease over time, being higher in kindergarten, decreasing almost 90% until the university (Löbler, 2006).

However, the same entrepreneurial experience will have different impacts on each child, which means that the success of the experience is directly linked to the way the child sees and perceives the experience and the degree to which he / she is involved (Torimiro and Dionco - Adetayo, 2005).

2.3 Relationship between entrepreneurial attitudes and motivations and other relevant factors

There may be several relationships between entrepreneurial attitudes and motivations and factors such as education (Löbler, 2006), gender (Kourilsky, 1980; Johansen and Clausen, 2011; Schoon and Duckworth, 2012; Geldhof et al., 2014), age (Schwarz et al., 2009; Staniewski and Szopinski, 2013; Sepúlveda and Bonilla, 2014), preferred areas (Etaugh and Liss, 1992), children's professional aspirations (O'Keefe and Hyde, 1983; Etaugh and Liss, 1992; Weisgram et al., 2010), parents' occupations (Van Auken et al., 2006; Johansen and Clausen, 2011; Arcand, 2012; Bosma et al., 2012; Chlosta et al., 2012; Sun and Lo, 2012; Lafuente and Vaillant, 2013; Geldhof et al., 2014), education level (Kourilsky, 1980; Johansen and Clausen, 2011; Greene et al., 2013) and access to entrepreneurial education (Kourilsky and Walstad, 1998; Fiet, 2000; Rasheed and Rasheed, 2003; Johansen and Clausen, 2011).

Several studies have been done on different degrees and stages of education. Many authors (eg, Hegarty and Jones, 2008; Oosterbeek et al., 2010) have studied the teaching of entrepreneurship at universities. Some (eg, Aşici and Aslan, 2010; Johansen and Clausen, 2011) studied the universe of secondary schools, while Aslan (2010) and Do Paço and Palinhas (2011) studied primary schools and Lindström (2013) pre-school education. However, there is a growing need to research entrepreneurial attitudes and motivations and the extent to which schools can improve children's entrepreneurial potential.

Regarding the gender discussion, several authors (eg, Johansen and Clausen, 2011) found that there are no significant differences with regard to entrepreneurial propensity / intention. In contrast, Schoon and Duckworth (2012) and Geldhof et al. (2014) state that boys have higher entrepreneurial intentions than girls. Kourilsky (1980) argues that there are gender differences and that the tendency is for girls to have greater entrepreneurial intent than boys.

The existing literature portrays the relationship between age and entrepreneurial intentions (Schwarz et al., 2009; Staniewski and Szopinski, 2013; Sepúlveda and Bonilla, 2014). This relationship can be in the form of a "u" as stated by Schwarz et al. (2009), having a positive relationship with age in the first phase and then flexing towards a negative relationship (Schwarz et al., 2009; Staniewski and Szopinski, 2013; Sepúlveda and Bonilla, 2014). Entrepreneurial intention grows most likely because at younger ages there is no career planning, and it also probably decreases due to a greater awareness of the risks inherent in entrepreneurship (Schwarz et al., 2009).

Family occupations influence children's vocations, however this influence is scarce, as stated by Barak et al. (1991). Children's vocations reveal their personality and the subjects / courses tend to be related to values and performance (Stein, 1971).

Parents and their occupations have a positive influence on children and on their present and future choices, because children identify with their parents' occupation and this influence is stronger at younger ages (Whiston and Keller, 2004). In addition, there is sufficient evidence that the entrepreneurial intention is positively correlated with having entrepreneurial parents (Chlosta et al., 2012; Sun and Lo, 2012; Geldhof et al., 2014), with the impact on the entrepreneurial intention of the parental, paternal and maternal behaviors are similar (Johansen and Clausen, 2011; Arcand, 2012; Chlosta et al., 2012).

The main objective of entrepreneurial education is, in addition to creating entrepreneurs, to be future business owners, touching students by changing their *modus operandi*. This means that attitudes and motivations can be changed through education / teaching so that students will have an entrepreneurial mindset in different aspects of business or non-business life (Hegarty and Jones, 2008).

3. Methodology

In order to study children's entrepreneurial attitudes and motivations, we asked two research questions: "What are the main entrepreneurial attitudes and motivations of children through their own eyes?" and "How does education / teaching reflect on children's attitudes and motivations?"

The present study consists of a quantitative analysis (questionnaire direct to students), involving 4 classes in total, from the 3rd and 4th year of a school in Porto, with a particular pro-entrepreneur context, where children are encouraged and taught from an early age to be leaders, problem solvers and entrepreneurs (CLIP, 2014). The questionnaire was implemented in June 2014 and the data were collected personally by the author of the present study.

The quantitative analysis was based on a questionnaire (following the Entrepreneurial Attitude Orientation Survey). All children were allowed to participate in the activity by the school and their parents. Not all children participated because some were not at school or in the classroom that day. The school was very helpful and made no restrictions on study. The study was treated anonymously. Teachers were present during the application of the questionnaire. Teachers' interference was none or minimal in relation to the activity, which was considered positive.

As mentioned, the school selected for the study is a school in Porto in a particular pro-entrepreneur context. This college has about 650 students, aged between 3 and 18 years old, from 25 different countries and invests in critical thinking, confident leadership, skillful communication, constructive team play and efficient problem solving. Of the three levels of learning - Lower school (Pre-K - Form 4); Middle school (Form 5 - Form 8); Upper school (Form 9 - Form 12) - given the objective of our study, we chose to focus on the Lower school, more specifically in the 3rd and 4th year, or Form 3 and 4 (CLIP, 2014).

The quantitative analysis covers an adaptation of the Entrepreneurial Attitude Orientation Survey (EAO). EAO is a tool for predicting entrepreneurial attitudes and motivations. It consists of 75 questions, each belonging to one of the four subscales of EAO: achievement, innovation, self-control and self-esteem. Each EAO question must be answered on a scale of "1" to "10", where "1" indicates strongly in disagreement with the statement and "10" indicates strongly in agreement. In addition to the need to translate the original EAO into Portuguese, the selected questions had to be adapted for the target population - children. Of the 75 questions we selected 15, to make an easy and feasible questionnaire to be answered by children.

Although the EAO scale is from "1" to "10", again for the sake of simplification given our target population, we chose a Likert scale from "1" to "5" with "smiles", where "☹" indicates that the student strongly disagrees with the statement and "☺" indicates that she / he strongly agrees with the statement. The 15 questions respect the EAO subscales, namely achievement, innovation, self-control and self-esteem (Robinson et al., 1991) - see summary in Table 1.

The questionnaire was reviewed by two senior professors and researchers with experience in implementing questionnaires: one from the Faculty of Economics of the University of Porto and another from the field of early childhood education at the University of Minho, Instituto de Educação. After reviewing the questionnaire, it was pre-tested on children belonging to the same age group as the target population. Changes to the questionnaire were made according to this pilot test.

The questionnaire was applied in the classroom. The children had approximately 15 minutes to complete it. The activity was first explained in Portuguese³ and there were no major complications related to the language. All questions were read one by one.

³The official language of the school is English. However, most of the students were Portuguese and all students who participated in the study understood Portuguese or had a translator.

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Achievement	Innovation	Self-control	Self esteem
1) I am very happy when I have the best results in the class.	4) I'm sad when I don't get to class on time.	7) I get upset when a colleague tries to boss me around.	10) I feel sad when they make fun of me.
2) I never leave to do important tasks (for example, homework) later.	5) When I am performing a new task, I usually follow the instructions given.	8) I always strive to be better.	11) I think it is important what my colleagues think of me.
3) I think the results are important to know how the school is going.	6) To have good results I have to do my homework, behave well and study.	9) I believe that if I work / study hard I will be recognized and rewarded by teachers and parents.	12) At school I tend to be very good at sports activities.
			13) At school I tend to be very good at activities related to studies.
			14) At school I tend to be very good at activities related to drawing and other artistic activities.
			15) I think my colleagues respect me for being good at the activities in which I get involved (for example, in sports or for being a good student)

Table 1: Selected EAO questions by category

Achievement it corresponds to strive for excellence and the selected questions take into account the achievement of results [(1) and (3)] and non-procrastination [(2)]. Innovation is defined through the creation of new things, in a unique way and is synonymous with creativity, questions 4) and 5) are quoted inversely and are relative to following the rules and 6) refers to the process necessary to achieve results / innovation. Self-control is linked to dealing with emotions during the execution of tasks and question 7) expresses how to deal with the feeling of frustration, while 8) and 9) highlight the effort put into a task in order to have an emotional reward. Self-esteem corresponds to how individuals feel about their own skills and abilities, questions 10),

As expected, 4th grade children were quicker to complete the activity, compared to 3rd grade children. At the end of the questionnaire, all children received an activity as a thank you, consisting of several games such as finding the differences and Sudoku.

Children had difficulties in general to respond to their parents' occupation. The teachers and the study author tried to help them in this process. Questions 4, 7 and 10 were re-explained because the students considered the answer to be non-intuitive and tended to respond in relation to smiles and not in relation to the scale.

Regarding the variable "what do you want to be when you are big" an open answer was placed and the students were able to answer as many occupations as they wanted. Occupations were categorized as creative, not creative with an academic degree, sport and others. Regarding the question "father occupation" and "mother occupation", the highest level of academic studies was considered between the two elements of the couple. Parental occupation was categorized according to the national classification of professions⁴ and for the study divided into entrepreneurs or non-entrepreneurs. The categorization according to national occupation

⁴ <http://cdp.portodigital.pt/profissoes/classificacao-nacional-das-profissoes-cnp>, accessed on 17 September 2014

categories includes: 1) Directors of civil service; company directors and management team; 2) Intellectuals and scientific experts; 3) Mid-level professionals; 4) Administrative; 5) Salesperson and service people; 6) Farmers and fishermen; 7) Workers and artisans; 8) Factory workers; 9) Unskilled workers.

As entrepreneurs we consider entrepreneurs, bosses and directors and other occupations normally carried out as independent professional activities or on a freelance basis (eg lawyers, economists, doctors, designers).

Regarding the subjects that students like most, they were invited to choose from several options, which are their three preferred. They were able to choose one, two or three answers. The possibilities were: Artistic Expression; English; Mathematics; PE; Portuguese; Study of the Environment; and others". If they chose "others" they had an open field to specify the answer.

4. Empirical results

4.1 Descriptive analysis

A total of 78 students from the 3rd and 4th grades participated in the study. The students were equally distributed in terms of gender and year of schooling: 39 female and 39 male students; 39 of the 3rd year and 39 of the 4th year.

The age of the students varied between 8 and 10 years. In total, 24% (19) of students aged 8, 59% (46) aged 9 and 17% (13) aged 10.

For the open question "what do you want to be when you are big", the results show that 33 (43%) children (22 as the first option) aspire to have a creative occupation, namely actor / actress. Sport-related occupations attract 22 children (16 as a first career option). Occupations related to science, especially those related to medicine, were chosen by 22 children as the first career option.

Most of the parents' occupations are related to levels 1 and 2 of the national classification of occupations, with a total of 61 responses, out of a total of 72, corresponding to 85%. The first level corresponds to directors and managers (26 parents), with the sample reflecting that many parents are business owners and business directors or managers. Regarding the second level, which relates to intellectual and scientific experts, many doctors, engineers and lawyers can be found. In the third category, mid-level professionals correspond to 12.5% (9 parents), and the fifth, salespeople and services with 2.8% (two parents).

As explained in the methodology, the parents were divided into entrepreneurs and non-entrepreneurs. Entrepreneurs include bosses, directors and independent professionals. Entrepreneurs have a greater expression, representing 62% of the total, corresponding to 48 parents.

With regard to the subjects that students like most, children were invited to choose, among several options, which were their three favorite areas. All students indicated at least one favorite area, 68 students indicated 2 and 53 indicated 3. Considering all the answers, most students prefer Mathematics (43 students), Physical Education (34) and Portuguese (33).

As explained in the methodology, we aggregate questions about entrepreneurial attitudes and motivations according to the *Entrepreneurial Attitude Orientation Survey* (AND TO) in 4 main categories: achievement, innovation, self-control and self-esteem. The highest average score (4.17) was obtained for self-control, followed by achievement (4.14), self-esteem (3.46) and with the lowest innovation score (3.04). Given the scale adopted (1 to 5), we can consider that, in general, the children surveyed have a high level of entrepreneurial attitudes.

4.2 Determinants of children's entrepreneurial attitudes: a causality analysis

In order to assess the origin of each entrepreneurial attitude - achievement, innovation, self-control and self-esteem - and the global entrepreneurial attitude (index calculated as a simple average of the four entrepreneurial attitudes considered), five logistic models are estimated where the dependent variable is a dummy assuming 1 when the score for each attitude is above average, and 0 otherwise. All five estimated models (Table 2) have a reasonable quality of fit - the null hypothesis of the Hosmer and Lemeshow test (the model represents reality well) is accepted and the percentage of observations of the correctly estimated dependent variable is above 60% . Based on the results, it is concluded that the main entrepreneurial determinants are gender and education.

Specifically, boys show, with everything else constant, higher levels of innovation and self-esteem; however, for the sample analyzed, boys and girls do not differ in terms of achievement, self-control and general entrepreneurial attitude.

The literature is divided in relation to gender, as there are authors who claim that there are no significant differences in relation to sex (eg, Johansen and Clausen, 2011), while others maintain that there are significant differences (Schoon and Duckworth, 2012; Geldhof et al., 2014). Geldhof et al. (2014) studied university students and argue that boys have higher levels of entrepreneurial intentions than girls. However, these studies correspond to different target ages compared to ours and we think it is not possible to make direct comparisons.

Education levels have a different impact on entrepreneurial attitudes. Global entrepreneurial attitudes and self-control attitudes are lower in children enrolled in the 4th year when compared to the 3rd year. In contrast, children enrolled in more advanced school years (4th) are, on average, significantly more innovative than their peers.

The results support Löbler (2006) and Robinson (2006) who argue that there would be a decrease in the levels of entrepreneurial attitudes with the entry of children into school following the normal teaching path. However, we cannot support Sir Ken Robinson's (2006) argument that "education takes creativity away from children". In reality, attitudes of innovation are positively related to levels of education and thus, given the relationship between innovation and creativity (Chell and Athayde, 2009; Gundry et al., 2014), education seems to increase innovation and creativity.

Finally, children's vocation, namely physical education, has an impact on children's innovation. Children for whom Physical Education is one of the preferred subjects, have lower levels of innovation.

		Global Entrepreneur Index	Achievement	Innovation	Self-control	Self esteem
Gender (defect: male)	Feminine	0.193	0.728	-1,455 **	0.219	-, 945 *
Schooling (defect: 3rd year)	4th year	-1.476 **	-, 394	1,755 ***	-1,181 **	-, 382
Vocations (defect: Other)	Mathematics	151	203	127	579	-, 419
	PE	-, 202	541	-1,189 *	-, 787	.45
	Portuguese	-, 499	-, 154	, 016	-, 836	083
	Artistic Expressions	-, 741	-, 260	-, 043	-, 233	-, 536
Aspirations (defect: Other)	Creative	061	351	-1.018	-, 555	168
	Not Creative	866	1,869	-1,118	674	088

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	Sport	-, 180	, 400	095	094	, 241
Context (parent occupation - defect: non-entrepreneurs)	Entrepreneurs	, 032	.45	-, 632	160	.661
	Constant	0.906	-1.007	608	1,072	, 599
	N	65	77	75	74	73
	Entrepreneurs	33	39	28	33	38
	Non-Entrepreneurs	32	38	47	41	35
Adjustment quality	Hosmer and Lameshow Test (p-value)	9,187 (0.239)	7.440 (0.490)	5.135 (0.643)	9,736 (0.284)	8.036 (0.430)
	% right	67.7	64.9	72.0	66.2	60.3

Note: *** (**) [*] Statistical significance at 1% (5%) [10%].

Table 2: Determinants of children's entrepreneurial attitudes (dependent variable: dummy that assumes a value of 1 when the score for each attitude is above average and 0 otherwise) - logistical estimates

5. Conclusions

The main research question of this study is: "What are the main entrepreneurial attitudes and motivations of children enrolled in primary school through their own eyes?", The objective of this study is to understand what are the main attitudes and motivations of children today , to assess how these attitudes and motivations are related to other relevant variables, that is, sex, age, education, vocation and aspiration of children and the occupations of parents, and to evaluate the influence of education on children's attitudes and motivations.

The literature has studied entrepreneurial education widely, namely with regard to university students (eg, Hegarty and Jones, 2008; Oosterbeek et al, 2010) and secondary school students (eg, Aşici and Aslan, 2010; Johansen and Clausen, 2011). Less has been done in relation to primary schools (Aslan, 2010; Do Paço and Palinhas, 2011) or pre-school education (Lindström, 2013). However, studies on primary schools do not focus on entrepreneurial attitudes and motivations in children's own perception, which is a gap in the literature and the main objective of our study.

We implemented a questionnaire with 78 children from a school in Porto, Portugal. That allowed us to reach the following conclusions about children's entrepreneurial attitudes and motivations:

- boys have higher levels of innovation than girls;
- from the 3rd to the 4th year there is a decrease in entrepreneurial attitudes in general, and self-control in particular, however attitudes of innovation are higher in 4th year students;
- children who enjoy physical education have lower levels of innovation.

Different types of limitations were felt during the study, namely it was difficult to access schools. In addition, the academic calendar delayed activities and limited research. It was also difficult to relate the observed reality to the existing literature regarding children's education and entrepreneurship. The inverse questions were another limiting factor in the study, as the students showed difficulty in interpreting them. Finally, added the fact that it is not possible in time to implement a longitudinal study.

In terms of future research, we understand that it would be important to study other schools with different types of entrepreneurial environments. The questionnaire should be reevaluated, since it was adapted to a target audience different from the initial one. After the review, the

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questionnaire should be tested and revalidated with children. When applying the questionnaire, all questions should be read out loud and children should have time to answer as the questions are read. Questions 4, 7 and 10 should be rewritten as the answers were not intuitive for the students. Ideally, it would be an asset to implement a longitudinal study with the same population as this study.

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