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Original Article

# Influence of the university environment in the entrepreneurial intention in public and private universities

## *Influência do ambiente universitário na intenção empreendedora em universidades públicas e privadas*

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**Abstract**

This study analyses the entrepreneurial intention (EI) in different higher education institutional environments – public and private universities. To achieve the objectives, an EI model adapted from Krueger et al. (2000) was used, which is known as Entrepreneurial Intention Classical Model. Data was collected using a structured questionnaire applied in three public universities and three private universities in the State of Rio Grande do Sul. Through comparative analysis and employing the Difference-in-Differences econometric method, it was seen that the results are in accordance with part of previous studies which pointed out that private university students have higher entrepreneurial intentions. However, the results also revealed that private university students already had higher EI before starting their graduation courses. Therefore, there is no evidence of difference of the influence of public and private university environments in EI, or in its underlying factors (that form EI), except for the factor that expresses the desire to learn about entrepreneurship.


*Keywords:* Entrepreneurship; Entrepreneurial intention; Students; Entrepreneurial education

**Resumo**

Neste artigo, tem-se como objetivo a analise da intenção empreendedora em diferentes ambientes institucionais de educação superior – universidades públicas e privadas. Para tanto, utilizou-se um modelo de intenção empreendedora adaptado de Krueger et al. (2000), conhecido como Modelo Clássico de Intenções Empreendedoras. Os dados foram coletados por meio de um questionário estruturado aplicado em três universidades públicas e três privadas do estado do Rio Grande do Sul. Através da análise comparativa utilizando-se do método econométrico de diferenças em diferenças evidenciou-se que os resultados estão de acordo com parte de estudos anteriores mostrando que os estudantes de universidades privadas têm intenções empreendedoras mais elevadas. No entanto, os resultados revelaram que os alunos das universidades privadas já tinham intenção empreendedora mais elevada antes de entrarem no curso superior. Assim, não há evidências de que exista diferença na influência do ambiente universitário público e privado na intenção empreendera, e nem nos fatores subjacentes desta (que formam a mesma), exceto para o fator que expressa o desejo de aprender sobre empreendedorismo.


*Palavras-chave:* Empreendedorismo; Intenção empreendedora; Estudantes; Educação empreendedora

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## Introduction

Entrepreneurship is an important social phenomenon, since it generates occupational opportunities and, consequently, reduces unemployment (Birch, 1981; Reynolds et al., 2001). Also, the entrepreneurial activity is able to stimulate regional development and economic growth (Acs & Storey, 2004; Morris, 1998; Porter, 2000; Reynolds, Storey, & Westhead, 1994) and, partly due to the latter, it promotes innovation (Acs & Storey, 2004; Sutaria & Hicks, 2004). Therefore, more and more governments of different countries devise programs to favor the creation of new companies and the promotion of entrepreneurship (Audretsch & Keilbach, 2004).

Since the 1980s, and in Brazil the beginning of the 2000s, the literature on entrepreneurship has become an important and fertile field of scientific investigation. Nowadays, entrepreneurship has been studied in several knowledge areas such as anthropology, geography, psychology, economy, business and sociology. One of the areas with great tradition is the study of individuals and their relation with the entrepreneurial event. Such line of investigation highlights the motivational (Shane, Locke, & Collins, 2003) and cognitive (Baron & Ward, 2004; Canever et al., 2017; Krueger, 2003) dimensions of the individuals in the creation of new companies and in entrepreneurship in general. In this study, the knowledge on cognition, specifically, the formation of entrepreneurial intention (EI) is used to analyze the influence of different institutional environments in university students' EI.

The Brazilian university system is made up of public and private institutions. The public Higher Education Institutions (HEI) are those maintained by the public fund and can be either federal, provincial or municipal. Private institutions are funded by natural persons or legal entities governed by the private law, and might or not to aim profit. Although there are exceptions, it is the public university that owns the largest and best qualified base of scientific investigation in the country (Audy, 2006; Hilu & Gisi, 2011; Speller et al., 2012). The emphasis on the private university is sustaining a financial equilibrium. To attract students, they seek strategies of differentiation, which are many times in tune with the immediate demands of the community and companies.

A recent movement was started to make universities more responsible and committed to the economic and social future of the regions where they are located (Iizuka and Moraes, 2014; Lima et al., 2014). Therefore, pedagogical concerns related to the innovation and entrepreneurial education has been raised in both types of universities. Thus, qualification of human resources in business has been stimulated, and better entrepreneurial spirit has been inducted by the creation of business incubators and technological parks. However, there is neither a clear and effective evaluation of these actions nor measurement of how these initiatives impact the attitudes, intentions and behavior of students in the public and private environments.

For the development of entrepreneurial traits in students, university education and entrepreneurship cannot be dissociated. The identification and analysis of such traits have a central role for the development of proper programs of entrepreneurial education. For this reason, investigating which factors determine EI in different institutional environments is vital to the entrepreneurship research, as EI is considered a primary predictor of future entrepreneurial behavior (Krueger, Reilly, & Carsrud, 2000; Schwartz, 2006). There is a growing number of studies focusing on the evaluation of EI in university environments (Lima et al., 2015; Perim, 2012; Pihie, Bagheri, & Sani, 2013; Silva & Teixeira, 2013; Wang & Wong, 2004). Such studies, in general, tend to focus on descriptive analyses pointing that the level of EI is higher among private university students than those in the public ones (Lima et al., 2014; Perim, 2012; Silva & Teixeira, 2013). However, these studies do not evaluate whether the university environment is the determining factor of such difference. Therefore, this study aims to analyze whether university environments (public and private) differ in the way they influence their students' entrepreneurial intention.

To achieve this objective, the theoretical background used as a starting point was the EI model proposed by Krueger et al. (2000). This model claims that EI is formed by the following antecedents: the desirability and viability of starting a business, which in turn depends on the acceptability of the entrepreneurial activity and the individuals' self-confidence in their entrepreneurial competences and abilities. To test this model, a survey was carried out with business administration students enrolled in six universities (three public and three private) in the state of Rio Grande do Sul. The main contribution of this study is concerned with the methodological ability for distinguishing the net effect of university environments on EI and antecedents. For that purpose an adapted Difference-in-Differences method was used. This method has been widely reported in the literature of public policy evaluations (Neri & Medrado, 2010), but scarcely used in entrepreneurship research.

After this introduction, a brief literature review about the models of entrepreneurial intentions and the characteristics of Brazilian public and private universities is presented. After that, the methodology is outlined. Results and discussion are presented together in the following section. Finally, some conclusions and implications of the results are outlined.

## Theoretical background

### *Model of entrepreneurial intention*

The traditional approach to the studies on entrepreneurial activity predicted that situational conditions (for example, position in the job market) and the individuals' personal characteristics (demographic characteristics or personality traits) (Krueger et al., 2000; Singh, Prasad, & Raut, 2012) were the major factors to define who would become an entrepreneur. However, this approach has been abandoned due to methodological and conceptual flaws, as well as for the lack of explanatory power of the entrepreneurial phenomenon (Krueger et al., 2000; Schwartz, 2006).

For Krueger et al. (2000), the intention models are superior to the models of traditional approach since the entrepreneurs are also shaped by motivational factors, the social environment and their perceptions of personal abilities. The authors suggest that setting up a business requires planned behavior which is

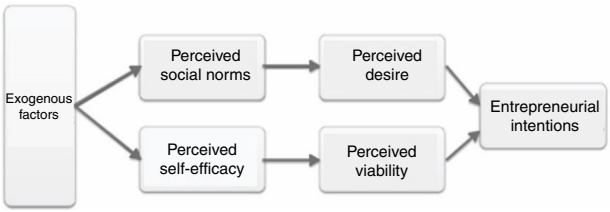


Fig. 1. Entrepreneurial Intention Classical Model.
Source: Adapted from Krueger et al. (2000).

preceded by intentions and attitudes and not only by individual characteristics. These intentions are building up along people's lives, and directly influenced by factors such as trust in owns abilities and capabilities, the acceptance of a particular career by important others in live, as well as by motivation and evaluation of opportunity, in addition to other factors.

The main models to measure entrepreneurial intentions are the Theory of Planned Behavior (TPB) by Ajzen (1985), Ajzen (1991) and the Shapero Entrepreneurial Event (SEE) proposed by Shapero and Sokol (1982). While the Ajzen's TPB model is general and can be used to analyze any human action, Shapero and Sokol's method is specific for the entrepreneurship analysis.

According to Krueger et al. (2000), both models, TPB and SEE, are largely similar one to another and both supply a precious tool to understand the entrepreneur's behavior. However, Krueger et al. (2000) proposed a model know as Classic Entrepreneurial Intention, based in the works of Shapero and Sokol (1982), Krueger (1993) and Krueger and Brazeal (1994), which has the advantage of broadness and high level of predictive accuracy (Solesvik, 2013). Fig. 1 illustrates the model developed by Krueger and co-authors.

Social norms (SN) are defined as the degree by which close people to the future entrepreneur accept the entrepreneurial choice as a career option. This acceptance reflects the influence of an organizational and/or social culture and provides guidance for what is considered acceptable in specific culture. Granovetter (1973) emphasizes the importance of social networks for several types of human entrepreneurship, in which they would play a vital role in the entrepreneurial process, insofar they could guide and facilitate, as well as constraint or inhibit certain opportunities.

The perceived desirability (PD) is a measure of the individuals' perception of how desirable is to be an entrepreneur. Perceived self-efficacy (SE), or the individuals' belief in their own capability of being successful in certain activity, is based on the individuals' perception of their own competences and abilities (Wilson, Kickul, & Marlino, 2007). This construct developed by Bandura (1997) reflects the individuals' faith in having abilities, as well as their belief that they will be able to convert these abilities successfully into a chosen result. The perceived viability (PV) refers to the individuals' perception that it is really viable, possible, for them to build up a career as a professional entrepreneur. Finally, the entrepreneurial intention (EI) measures the individuals' actual intention to start a business.

Our analysis will be carried out within this theoretical and conceptual background to verify whether different university environments exert different influence in each of the cognitive spheres related to making a decision toward entrepreneurship.

### *Entrepreneurial intention and environment influence*

As previously seen and following the theory used in this article it is reasonable to expect that both the product, that is the EI, and also its preceding factors (underlying factors) are influenced by circumstances beyond the individuals. According to Dornelas (2005), entrepreneurs are the results of the time and place where they live. The literature about entrepreneurship suggests that the environment where the individuals interact has great influence in the decision to become entrepreneurs. Veciana, Aponte, and Urbano (2002) highlighted the importance of culture, but also the social, political and economic factors as determinant of entrepreneurial intention. Shane et al. (2003) pointed out that the desire to become involved in entrepreneurial activities depends on aspects such as the country legal system, the business life stage, the availability of capital in the economy and for the industry, as well as the global economy situation. Díaz-Casero et al. (2012) claim that the social and cultural environment influence the creation of beliefs, values and attitudes, which in turn influence individuals' behavior. The environment where the individuals interact in a daily basis as family, community, church is able to impact the desire and viability to become an entrepreneur, as well as the final intention of setting up a new business or not (Birch, 1978; Bruno & Tyebjee, 1982; Burch, 1986; Dubini, 1989; Kent, 1984).

#### *Public University × Private University*

Results from empirical studies suggest that access to higher education reduces the individuals intention to engage in entrepreneurial activities (Li, Wu, & Wu, 2008; Nabi et al., 2011). But other studies show an opposite effect (Blanchflower & Meyer, 1994; Ertuna & Gurel, 2011; Zhang, Duysters, & Cloodt, 2014). Although there is an increasing number of studies that address external factors that influence students' EI (Kibler, 2013), the understanding of the role played by different types of universities to promote entrepreneurial intention is still limited. As the environment of public and private university is different, it is expected that the entrepreneurial intention of students also differ. This is because public universities are comprised by a larger number of professors dedicated to research (Hilu & Gisi, 2011; Speller et al., 2012) compared to the private university. That is, most of the public staffs holds the PhD Degrees, are involved in scientific research and in teaching in post-graduation programs (Pontes, 2015). As a result these institutions are the largest and best qualified base for scientific investigation in the country (Diniz-Filho et al., 2016). Professors engaged in scientific research have access to scholarships and public funding for research, in which undergraduate and graduate students are also engaged.

According to Andrade (2012), researchers and scientists direct their efforts to answer questions of scientific interest, without being particularly committed with the articulation of these issues with the demands of the society. Thus, the public university environment tends to be far from the "real world", which

can be considered a barrier to the promotion of entrepreneurial intention. Higher availability of post-graduation programs and scientific initiation scholarship in the public HEI reinforces students' interest in the academic career (Silva & Teixeira, 2013), instead of taking risk as future entrepreneurs. As there is low connection between science production, which is essentially developed in public HEI, with the market (Ipiranga, Freitas, & Paiva, 2010; Pontes, 2015) one can expect that in this university environment there is also low stimuli to motivate entrepreneurial intention in the students.

The interaction of universities and companies allows proximity with the technical, economic and social reality of the job market (Leher, 2004). Audy (2006) highlights that the Triple Helix (interaction between government, university and businesses) still needs to be consolidated in Brazil for the universities become more favorable to the emergence of an "entrepreneurial spirit" among students. Therefore, the current education system emphasizes the acquisition of knowledge without concerns with the development of abilities for its productive use (Greatti et al., 2010).

Some studies that sought to compare the level of entrepreneurial intention of the public and private universities (Perim, 2012; Silva & Teixeira, 2013) reported that students from the private universities perceive their institutions as more dedicated to the entrepreneurial education than their counterparts perceives the public universities. Perim (2012) draws attention to the fact that public institution students perceived greater need for practical entrepreneurship classes, since their education is more focused on theory. All these factors suggest that private institutions are better able to impact positively students' entrepreneurial intention than public institutions. Therefore, the basic proposition of this study is that the private university environment is more favorable to entrepreneurship than the public university environment.

## Data and methods

### *Sample*

The sample comprises students from the first and the two last semesters enrolled on business administration course. Administration students were chosen because the course is regularly offered by many universities, both public and private. Moreover, administration students are familiar with entrepreneurship since they chose an academic career which is very close to the theme. Before the final application of data, the measurement instruments were build up from scales already existing in the literature (see item 3.2 in this section). After the instruments had been devised, they were tested with students in the middle semesters of business administration courses in one of the federal universities included in the sample. This evaluation was carried out in two steps and from them, changes were performed in the way the questions were proposed. Unsuitable questions were excluded in order to measure the constructs of interest.

The survey was carried out through the application of a questionnaires in three traditional public universities in the State of Rio Grande do Sul (one in the city of Rio Grande, one in Pelotas and one in Porto Alegre). These universities were founded in the 1960s and their business administration courses are in existence for over ten years. The private universities (also three, two in Pelotas and one in São Leopoldo) are among the first ones acting in the State and in the metropolitan region of Porto Alegre. The business administration course is among the most popular in each of the universities and already exists for over ten years.

The total sample comprised 566 students, from which, 332 students are in private HEI, with 198 enrolled in the first semester of the course (Freshmen) and 134 in the two last semesters – from the seventh semester on (Seniors). 234 questionnaires were applied to the public HEI students, from which 120 were enrolled in the first semester (Freshmen) and 114 in the last three semesters (Seniors). Table 1 shows the descriptive characteristics of the sample regarding type of university and period.

Table 1 shows that in the private university sample, on average, women are more present, students are older, the family monthly income is lower when compared to the public HEI students. In addition to that, a greater number of public university students never thought of becoming an entrepreneur (18.88%), and more students plan to work in the public sector after graduating when compared to the students in the private sector (17.63% and 27.19% respectively). A greater number of private HEI students are found in the job market. While only 17% of these students do not work (neither as trainees, employees or running their own businesses), at the public universities, more than 37% of students are in the same situation.

### *Measuring procedures*

Since a single standard instrument valid to measure entrepreneurial intention or its preceding factors was not found, we decided to devise a questionnaire including items found in several studies. The full instrument is in the appendices with details about sources and scales. In general the items were measured by 5-point likert scale, varying from 1 (totally disagree/highly unlikely) to 5 (totally agree/highly likely). Entrepreneurial intention (EI) was based on 8 questions, while Perceived Social Norms (SN), Perceived Desirability (PD), Perceived self-efficacy (SE) and Perceived viability (PV) were based, respectively on 7, 15, 8 and 18 questions.

## Methods employed

### *Factorial analysis*

To analyze each of the model dimensions, exploratory factorial analysis (aided by the software SPSS 20) was used with the objective of reducing the great number of variables into factors (Hair, 2009). Thus, in this phase, some of the items in the questionnaire were excluded based on their respective factor loadings. The number of factors to be extracted per dimension followed the sedimentation diagram criteria (*Scree Plot*) and factors with eigenvalues higher than 1.

After this step, the factors extracted from each dimension of the model proposed by Krueger et al. (2000), the means of each factor and their respective standard deviations were analyzed

Table 1
Sample descriptive characteristics.

| University | Public | | | | Private | | | |
|---|---|---|---|---|---|---|---|---|
| Period | Freshmen | | Seniors | | Freshmen | | Seniors | |
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Age (years) | 21.74 | 5.35 | 24.76 | 5.31 | 23.35 | 5.94 | 27.22 | 6.39 |
| Family entrepreneurs (unit) | 0.65 | 0.93 | 0.73 | 0.91 | 0.68 | 0.80 | 0.66 | 0.77 |
| *Gender (%)* | | | | | | | | |
| Women | 45.83 | | 46.49 | | 56.06 | | 66.42 | |
| Men | 54.17 | | 53.51 | | 43.94 | | 33.58 | |
| *Marital status (%)* | | | | | | | | |
| Single | 88.33 | | 82.30 | | 78.79 | | 60.15 | |
| Not Single | 11.67 | | 17.70 | | 21.21 | | 39.85 | |
| *Monthly household income (%)* | | | | | | | | |
| Up to R$ 3900.00 | 55.27 | | 35.77 | | 76.8 | | 66.16 | |
| Above R$ 3900.00 | 44.73 | | 64.23 | | 23.2 | | 33.83 | |
| *Work (%)* | | | | | | | | |
| Work | 44.54 | | 81.7 | | 75.13 | | 94.03 | |
| Not work | 55.46 | | 19.3 | | 24.87 | | 5.97 | |

Source: Elaborated by the authors.

into four groups – the public and private university students; and – the stage in the course (freshmen – those in the beginning) and (seniors – those next to the end of the course. This analysis enabled the verification of the individuals' perception regarding each factor and the differences between public and private students in the two periods under consideration.

### *Difference-in-differences method*

After creating the factors, as demonstrated above, they were stored and, later on, used as a base for the tests to answer the main objective of this study through the Difference-in-Differences method (Neri & Medrado, 2010). This method needs information from the observation of at least two groups exposed to different treatments. In this case, the treatment is the university environment (public and private) with information in at least two periods of time (prior and after exposure to the treatment).

The group representing the private HEI was considered the first one (exposed to treatment), while that comprising students from the public HEI was the second (not exposed to treatment). The two moments are the beginning and the end of university courses. At the beginning of the course, it is assumed that students still not received a great influence of the university environment. Therefore, the university effects are not present yet. On the other hand, at the end (two last semesters) it is expected that student have already received interferences from the university environment in their intentions.

The central assumption to identify the different effects of higher education institutions (HEI) on the EI is the following: if the students of private HEI were students of the public HEI, no different behavior would be observed regarding EI. That is, supposing private institution students were public institutions students, the entrepreneurial intention of the first group of students would be the same along the time (from the beginning to the end of the graduation course) as that of the second group. With this assumption, any deviation observed between the entrepreneurial intentions along the course by the private HEI students in relation to the public HEI students is the effect of the university environment modifying their intentions.

Putting it in formal terms, we have the following equation[1]:

$$Y_{it} = a_0 + a_1 P_{it} + a_2 T_t + a_3 p_{it} * T_t + \varepsilon_{it} \quad (1)$$

The dependent variable $Y$ is the entrepreneurial intention measure, as well as each of the factors that represent the dimensions able to influence the entrepreneurial intention (social norms, self-efficacy, desirability and viability). Variable $P$ is a binary variable that assumes value 1 for the first group (being a private university student) and value 0 for the second group (being a public university student). Variable $T$ is also a binary variable that assumes value 1 for the students in the final semesters of the course and 0 for the students in the first semester.

The interest coefficient estimated is which captures the difference of conditional differences in the dependent variable between the two periods. To illustrate this statement, we present the four following conditional expectations:

$$E[Y_{it}|P_{it} = 1, T_t = 1] = a_0 + a_1 + a_2 + a_3 + E[\varepsilon_{it}|P_{it} = 1, T_t = 1] \quad (a)$$

$$E[Y_{it}|P_{it} = 1, T_t = 0] = a_0 + a_1 + E[\varepsilon_{it}|P_{it} = 1, T_t = 0] \quad (b)$$

$$E[Y_{it}|P_{it} = 0, T_t = 1] = a_0 + a_2 + E[\varepsilon_{it}|P_{it} = 0, T_t = 1] \quad (c)$$

$$E[Y_{it}|P_{it} = 0, T_t = 0] = a_0 + E[\varepsilon_{it}|P_{it} = 0, T_t = 0] \quad (d)$$

Then, by performing the differences (a)-(b) and (c)-(d) we obtain:

$$(a) - (b) = a_2 + a_3 + \{E[\varepsilon_{it}|P_{it} = 1, T_t = 1] - E[\varepsilon_{it}|P_{it} = 1, T_t = 0]\} \quad (e)$$

$$(c) - (d) = a_2 + \{E[\varepsilon_{it}|P_{it} = 1, T_t = 1] - E[\varepsilon_{it}|P_{it} = 1, T_t = 0]\} \quad (f)$$

[1] For the sake of simplicity, a model without controls of observable characteristics was used.

Table 2
Factors, factor loadings, explained variance and Cronbach's Alpha.

| Social norms | | | Desirability | | | Self-efficacy | | Viability | | | Entrepreneurial intention | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Items | F1SN | F2SN | Items | F1PD | F2PD | Items | FSE | Items | F1PV | F2PV | Items | FEI |
| SN01 | 0.789 | | PD01 | | 0.759 | SE01 | 0.767 | PV03 | | 0.835 | EI01 | 0.802 |
| SN02 | 0.726 | | PD02 | | 0.771 | SE02 | 0.781 | PV04 | | 0.855 | EI02 | 0.875 |
| SN03 | 0.603 | | PD03 | | 0.844 | SE03 | 0.760 | PV05 | | 0.733 | EI03 | 0.893 |
| SN04 | 0.690 | | PD04 | | 0.856 | SE04 | 0.736 | PV06 | | 0.817 | EI04 | 0.886 |
| SN05 | | 0.816 | PD05 | | 0.771 | SE05 | 0.639 | PV11 | 0.744 | | EI05 | 0.896 |
| SN06 | | 0.789 | PD07 | 0.784 | | SE06 | 0.775 | PV12 | 0.756 | | EI06 | 0.866 |
| SN07 | | 0.832 | PD08 | 0.742 | | SE07 | 0.772 | PV13 | 0.792 | | EI07 | 0.622 |
| | | | PD09 | 0.815 | | SE08 | 0.579 | PV14 | 0.807 | | EI08 | 0.757 |
| | | | PD10 | 0.833 | | | | PV15 | 0.846 | | | |
| | | | PD11 | 0.865 | | | | PV16 | 0.843 | | | |
| | | | PD12 | 0.553 | | | | PV17 | 0.826 | | | |
| | | | PD14 | 0.582 | | | | PV18 | 0.793 | | | |
| | | | PD15 | 0.685 | | | | | | | | |
| Alpha of Cronbach | 0.66 | 0.75 | | 0.89 | 0.87 | | 0.87 | | 0.92 | 0.84 | | 0.93 |
| Variance Explained % | 29.25 | 28.97 | | 34.73 | 26.49 | | 53.21 | | 43.03 | 22.46 | | 68.81 |

Source: Elaborated by the authors.

Finally, with the assumption of the identification of the Difference-in-Differences Method, we obtain $a_3$ from (e)–(f).

In order to test the robustness of the results generated by the method, Eq. (1) was estimated in four different specifications: In the first, no control variable was included (exactly in the way presented in Eq. (1)). In the second specification, demographic and social controls that could influence students' entrepreneurial intention were added, along with the variables of the model proposed by Krueger et al. (2000). The variables used were the monthly family income, the parents' level of education, the type of school where elementary and high school courses were carried out, gender, age, marital status and the number of closer relatives that are entrepreneurs. In the third specification the location of the university was used as control, whether it was in the metropolitan region or outside it. This control was chosen, since the macro environment, where the university is inserted, might have some influence in the students' entrepreneurial intention due to the different opportunities of the local job market. Finally, the fourth specification was estimated with the controls used in the second and third specifications. The estimates were carried out aided by the econometric software Stata 13.

## Results

First will be presented the results of the factorial analysis carried out to reduce the items used to measure each dimensions into factors. Table 2 present factor loadings of each items/questions and reliability tests (*Cronbach Alpha)* of the resultant factors. The reliability test measures the internal consistency of each factor extracted. Considering the values obtained, all resulting factors are suitable, since they present an alpha value over 0.6.

The factor analysis on the items for measuring the Perceived Social Norms (SN), Perceived Desirability (PD) and Perceived Viability (PV) was unable to produce a single factor for each dimension. The first factor resulting from the dimension Perceived Social Norms (F1SN) represents the opinion of relatives, friends and important people about the possibility of the respondent to become an entrepreneur. The second factor (F2SN) corresponds to the importance the students give to these opinions.

Factor 1 of the Perceived Desiribility dimension (F1PD), corresponds to the desire to opt for entrepreneurship as a professional career, while the second factor (F2PD), refers to the desire to learn and acquire higher level of knowledge about entrepreneurship. The Perceived Viability measurement generated two factors, namely (F1PV) related to the knowledge about available support to the entrepreneur, and (F2PV), which refers to the individuals' perception about the existing viability to start their own business. Finally, the measurement of the two other dimensions, Perceived Self-efficacy (FSE) and Entrepreneurial Intention (FEI) resulted in a single factor solution, portraying, respectively the self-confidence in one's entrepreneurial abilities and skills and the actual entrepreneurial intention of the university students.

With the items already translated into factors, the means and respective standard deviations (SD) regarding type of university and periods were analyzed. The results are presented in Table 3.

The means of all factors were higher for students enrolled in private institutions, for both freshmen and seniors. However, for while, we cannot say that these results is yielded by environmental differences between HEI. Table 4 presents the results obtained using the Difference-in-Differences Method four the four models of Eq. (1).

The results show that the fact of studying in a private university tends to increase (positive signal) or reduce (negative signal) each factor when compared to the students who study in a public university. If the difference is significant, it is likely that it results from the environment, since the individuals' characteristics that affect both groups in the different environments along time were controlled.

The result analysis revealed that the only statistically significant estimates refer to the second factor (F2PD) of Perceived Desirability. This difference shows that private university students have, on average, at the end of the course higher desire to

Table 3
Descriptive Statistics of factors.

| University | Private | | | | Public | | | |
|---|---|---|---|---|---|---|---|---|
| Period | Freshmen | | Seniors | | Freshmen | | Seniors | |
| Factors | Mean | DP | Mean | DP | Mean | DP | Mean | DP |
| FEI | 0.31 | 0.90 | −0.01 | 0.98 | −0.24 | 0.99 | −0.27 | 1.06 |
| F1SN | 0.12 | 0.95 | −0.06 | 1.04 | 0.07 | 0.97 | −0.20 | 1.04 |
| F2SN | −0.01 | 1.04 | 0.06 | 0.98 | −0.02 | 1.01 | −0.02 | 0.96 |
| FSE | 0.11 | 0.99 | 0.07 | 1.03 | −0.13 | 0.94 | −0.13 | 1.02 |
| F1PD | 0.17 | 0.86 | 0.08 | 0.91 | −0.15 | 1.05 | −0.22 | 1.19 |
| F2PD | 0.20 | 0.94 | 0.19 | 0.87 | 0.04 | 0.90 | −0.60 | 1.12 |
| F1PV | 0.01 | 1.06 | 0.18 | 0.88 | −0.23 | 1.12 | 0.02 | 0.83 |
| F2PV | 0.51 | 0.90 | −0.12 | 0.94 | 0.02 | 0.82 | −0.75 | 0.90 |

Source: Elaborated by the authors.

Table 4
University effect on the factors.

| Factors | Models | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| | Coef/DP | Coef/DP | Coef/DP | Coef/DP |
| FEI | −0.285 | −0.102 | −0.293* | −0.103 |
| | 0.173 | 0.176 | 0.173 | 0.175 |
| F1SN | 0.097 | 0.160 | 0.097 | 0.158 |
| | 0.176 | 0.187 | 0.176 | 0.186 |
| F2SN | 0.077 | 0.009 | 0.077 | 0.008 |
| | 0.174 | 0.183 | 0.174 | 0.183 |
| FSE | −0.037 | 0.212 | −0.053 | 0.205 |
| | 0.173 | 0.169 | 0.171 | 0.166 |
| F1PD | −0.017 | 0.230 | −0.026 | 0.228 |
| | 0.182 | 0.188 | 0.182 | 0.188 |
| F2PD | 0.629*** | 0.612*** | 0.616*** | 0.608*** |
| | 0.171 | 0.179 | 0.170 | 0.177 |
| F1PV | −0.070 | −0.070 | −0.073 | −0.064 |
| | 0.173 | 0.180 | 0.173 | 0.180 |
| F2PV | 0.150 | 0.213 | 0.164 | 0.202 |
| | 0.158 | 0.165 | 0.154 | 0.162 |

Note:
* $p<0.1$.
*** $p<0.01$.
(1) Diff-in-Diff without control.
(2) Diff-in-Diff with demographic control.
(3) Diff-in-Diff with university location control.
(4) Diff-in-Diff with demographic and university location controls.

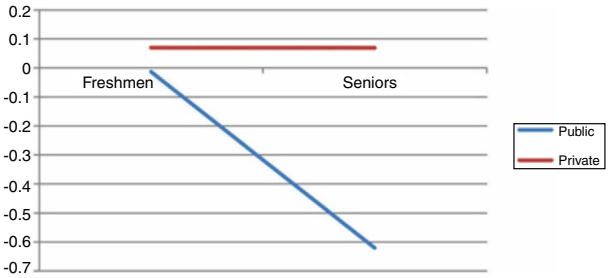


Figure 2. Trajectories of the desire to learn and to attend entrepreneurship courses (F2PD).
Source: Elaborated by the authors.

learn and attend entrepreneurship courses than the public HEI students. Therefore, after interpreting this result, one can mistakenly conclude that the private university environment influences more strongly students' desire to learn entrepreneurship-related content when compared to the public environment. However, when the estimates of this factor are verified (Table 5 and Fig. 2), one realizes that private HEI students' desire remains almost constant from the beginning to the end of the course, while there is a considerable decrease for the public university students.

Although the results in the most relevant factors were not seen significant, the negative signal especially for FEI shows that private university environment would be a negative influence to the entrepreneurial intention when compared to the public HEI environment. However, as this and others results were not significant we cannot say that the environmental influences are different. The trajectories of EI and its antecedent's imposed by the two university environments are equal Moreover, the fact that the EI (main dependent variable), did not respond to the "treatment" might be related to the lack of response from the other treatment factors.

## Discussion and final remarks

The results of this study lead to the conclusion that the two main types of Brazilian university environments (public and private) did not present differences in the way they influence EI or its preceding factors, according to the model put forward by Krueger et al. (2000). The only factor in which the trajectory of both types of university differed was the per-

Table 5
Equation (4) for F2PD.

| Estimation of differences in differences | | | | | | | |
|---|---|---|---|---|---|---|---|
| Period | Freshmen | | | Seniors | | | Diff-in-Diff |
| Result variable | Public | Private | Diff | Public | Private | Diff | |
| F2PD | −0.013 | 0.070 | 0.082 | −0.621 | 0.069 | 0.691 | 0.608 |
| Standard deviation (SD) | 0.338 | 0.348 | 0.118 | 0.370 | 0.373 | 0.140 | 0.177 |
| $T$ | −0.040 | 0.200 | 0.700 | −1.680 | 0.190 | 4.930 | 3.430 |
| $P>\|t\|$ | 0.970 | 0.841 | 0.485 | 0.094 | 0.852 | 0.000*** | 0.001*** |

Source: Elaborated by the authors.
Note:
*** $p<0.01$.

ceived desire to learn about entrepreneurship, whose signal and magnitude of the results revealed that public HEI students, after attending university for around four years, were not as interested in this type of learning as at the beginning of the course. On the contrary, in private HEI this tendency was not seen.

The results of this study do not confirm previous studies (Perim, 2012; Silva & Teixeira, 2013), that have argued that private university is a better place for entrepreneurship. As already said the environments influenced the individuals in a similar way. In this study, developed through a robust methodological approach, the net effect of university environments on entrepreneurial intention and its preceding factors was demonstrated. For that, three relevant points were taken into consideration: (1) students' observable variables; (2) the possibility of these students already having this level of entrepreneurial intention before entering the university; and (3) other factors that affect students' entrepreneurial intention which originate from the macro environment rather than the university environment. The results of this study showed that after controlling all these three points (evidenced in Eq. (4) of Table 5) the net effect was practically null.

However, in addition of showing that public and private university environments do not impact differently students' entrepreneurial intention, this study also highlights that the university environment as a whole is not favorable to the development of the entrepreneurial intention. The literature had already shown that the impact of higher education on entrepreneurial intention was contradictory at an international level (Joensuu-Salo, Varamäki, & Viljamaa, 2015), but this study present relevant information for the Brazilian case. Two rules were derived from these results: (01) the means of all constructs in the Krueger et al. (2000) model tend to decrease from the beginning to the end of the undergraduate course, except for the F1PV and F2SN in the private university environment; (02) from the beginning to the end of the bachelor period, the constructs' means decreases more or increases less at public university than at private university. Therefore, even though recent literature emphasizes the importance of universities for supporting and favoring the entrepreneurial spirit of their students (Ertuna & Gurel, 2011; Perim, 2012; Silva & Teixeira, 2013; Zhang et al., 2014), the university environment, regardless whether public or private, tends to discourage entrepreneurial intention.

The implications derived from this study draw attention to the need to modernize the Brazilian university environment, a recommendation already put forward by Arbix and Consoni (2011). This environment should be more pro-active and rich in experiences that boost students' self-steem and confidence. Another important point relates to the pedagogical solutions that motivates students to innovation and creative behavior (Fayolle, 2013; Joensuu-Salo et al., 2015; Jones & Iredale, 2010).

Although the objectives of this study were ambitions and the results innovative, we are aware of the limitations that have to be explored in future works. One of the elements to be improved is the measurement and validation of scales. The instruments were built up from questions found in several studies, and in general resulted in more than one factor per dimension. Obviously, improvement is needed aiming at obtaining only one factor solution per dimension, which would more coherently reflect Krueger et al. (2000) model. Finally, it seems relevant to highlight that the evidence discussed refers to the state of Rio Grande do Sul. Further studies, including other states and perhaps employing different methods seem to be necessary to validate the results obtained in this study.

## Conflicts of interest

The authors declare no conflicts of interest.

## Appendix A. Questionnaire

*A. Sociodemographic data*

| | |
|---|---|
| **What's your gender?** | ( ) Female ( ) Male Age (years old): . . .. . . |
| **Marital status** | ( ) Single ( ) Stable union ( ) Married ( ) Divorced ( ) Widow(er) |
| **What's your hometown?** | ( ) Pelotas ( ) Rio Grande ( ) Another one. Which? . . .. . . |
| **What do you study at university?** | . . .. . . |
| **What's your average mark in the academic transcript (higher course) up to now?** | . . .. . . |
| **When is your graduation? (Month/Year)** | . . .. . . |
| **Do you have another degree?** | ( ) No ( ) Yes. Which? . . .. . . |

**Please answer these questions according to your level of satisfaction respecting the following scale:**
Unsatisfied (1) (2) (3) (4) (5) Really satisfied

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Are you happy with your graduation course? | | | | | |
| Are you happy with your higher education institution? | | | | | |

**Given your current reality (knowledge, economic, expectations, etc.), what are you planning to do after you graduate?**

(1) Keep studying (Specialization, Masters'. . .)
(2) Start my own business
(3) Work in the family business(es)
(4) Work as an employee in the private sector
(5) Work as an employee in the public sector after having passed a public test
(6) Develop more than one of the previous alternatives. Which ones? . . .. . .
(7) I do not know.

**Does anybody in your family run their own business? (choose according to the following options and if necessary choose more than one option):**

( ) Father ( ) Mother ( ) Brother ( ) Sister ( ) Grandparents ( ) Others. . .. . . ( ) No

**Have you ever considered becoming an entrepreneur?** ( ) Yes ( ) No

**What's the monthly income in your house?**

( ) up to R$ 260.00
( ) from R$ 261.00 to R$ 780.00
( ) from R$ 781.00 to R$ 1300.00
( ) from R$ 1301.00 to R$ 1820.00
( ) from R$ 1821.00 to R$ 2600.00
( ) from R$ 2601.00 to R$ 3900.00
( ) from R$ 3901.00 to R$ 5200.00
( ) from R$ 5201.00 to R$ 6500.00
( ) from R$ 6501.00 to R$ 7800.00
( ) over R$ 7800.00

**Do you have a job?**

( ) Yes, I run my own business
( ) Yes, I work in my family business
( ) Yes, I work as a trainee in the private sector
( ) Yes, I work as an employee in the private sector
( ) Yes, I work as a trainee in the public sector
( ) Yes, I work as an employee in the public sector
( ) I don't work

**How long have you had this job (in months)?** . . .. . .

**What's your father's level of education?**

( ) illiterate
( ) incomplete elementary school
( ) complete elementary school
( ) incomplete high school
( ) complete high school
( ) incomplete graduation course
( ) complete graduation course
( ) post-graduation and/or Masters' Degree and/or PhD
( ) I don't know

**What's your mother's level of education?**

( ) illiterate
( ) incomplete elementary school
( ) complete elementary school
( ) incomplete high school
( ) complete high school
( ) incomplete graduation course
( ) complete graduation course
( ) post-graduation and/or Masters' Degree and/or PhD
( ) I don't know

**What's your elementary school background?**

( ) whole course in a public school
( ) whole course in a private school
( ) mostly in public school
( ) mostly in private school

**What's your high school background?**

( ) whole course in a public school
( ) whole course in a private school
( ) mostly in public school
( ) mostly in private school

**Did you attend a course preparing for university entrance exams** (*vestibular/Enem*)?

( ) yes, for less than a semester
( ) yes, for 1 semester
( ) yes, for 1 year
( ) yes, for over 1 year
( ) no

*B. Entrepreneurial intentions*

**I – Please, answer the questions below taking into consideration how people who are important in your life feel about the possibility of you becoming an entrepreneur.**
**Answer the questions from your level of agreement with the following statements:**

I entirely disagree (1) (2) (3) (4) (5) I entirely agree

| Items | Origin | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|
| SN01 | Krueger et al. (2000) | If I decided to start my own business, my relatives and family would support my decision | | | | | |
| SN02 | | If I decided to start my own business, my friends would support my decision | | | | | |
| SN03 | | People I know and that care for me would like me to start my own business | | | | | |
| SN04 | | Becoming an entrepreneur is considered a good option by my family | | | | | |
| SN05 | Kolvereid (1996) | I care about my family's opinion in relation to my career | | | | | |
| SN06 | | I care about my friends' opinion in relation to my career | | | | | |
| SN07 | | I care about the opinion of people who are important for me in relation to my career | | | | | |

**II – The following questions should be answered according to the desire to become an entrepreneur.**
**Would you attend entrepreneurship courses that addressed the following entrepreneurial aspects? Indicate your choice as:**

Unlikely (1) (2) (3) (4) (5) Highly likely

| Items | Origin | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|
| PD01 | Krueger et al. (2000) | Knowledge about the entrepreneurial environment | | | | | |
| PD02 | | The importance of the entrepreneur figure to the society | | | | | |
| PD03 | | The advantages of becoming an entrepreneur | | | | | |
| PD04 | | Necessary abilities to become an entrepreneur | | | | | |
| PD05 | | Knowledge on how to start a new business | | | | | |

**For the questions below, indicate your choice as:**

I entirely disagree (1) (2) (3) (4) (5) I entirely agree

| Items | Origin | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|
| PD06 | Krueger et al. (2000) | For me, becoming an entrepreneur implies more advantages than disadvantages | | | | | |
| PD07 | | For me, a career as an entrepreneur is attractive | | | | | |
| PD08 | | If I had the opportunity and resources, I would like to start a business | | | | | |
| PD09 | | For me, becoming an entrepreneur would bring great satisfaction | | | | | |
| PD10 | | From all career options available, the one I like best is to become an entrepreneur | | | | | |
| PD11 | | I really desire to start my own business | | | | | |
| PD12 | | Nothing would make me stressed if I started my own business | | | | | |
| PD13 | | I do not think that starting my own business is an unbearable job | | | | | |
| PD14 | | I consider highly desirable for people with my level of education to become an entrepreneur | | | | | |
| PD15 | | I would rather start a new business than be the manager of an existing business | | | | | |

**III – Now you will answer questions related to your perception of your personal capability of becoming an entrepreneur.**
**Please, indicate your choice as:**

I entirely disagree (1) (2) (3) (4) (5) I entirely agree

| Items | Origin | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|
| SE01 | McGee et al. (2009) | I believe that I can easily identify new business opportunities | | | | | |
| SE02 | | I believe that I can think creatively about issues related to the business | | | | | |
| SE03 | | I believe in my capability to suggest new ideas for products and services | | | | | |
| SE04 | Autio et al. (2001) | I am mentally prepared to start a new business | | | | | |
| SE05 | | I know the practical details to start a new business | | | | | |
| SE06 | | I can identify a good opportunity ahead from the others | | | | | |
| SE07 | | I have the abilities and skills necessary to be successful as an entrepreneur | | | | | |
| SE08 | McGee et al. (2009) | I believe in my capability to assign tasks or responsibilities to others | | | | | |

**IV – The questions below refer to your perception of the viability of starting a new business.**
Please, indicate your choice as:

I entirely disagree (1) (2) (3) (4) (5) I entirely agree

| Items | Origin | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|
| PV01 | Autio et al. (2001) | Entrepreneurship cannot be taught | | | | | |
| PV02 | | I know many people in my university who started their own businesses successfully | | | | | |
| PV03 | | In my university, there is a good infrastructure to support the startup of new businesses | | | | | |
| PV04 | | In my university, people are actively encouraged to follow their own ideas | | | | | |
| PV05 | | In my university, there are several people with good ideas for a new business | | | | | |
| PV06 | Autio et al. (1997) | Entrepreneurship courses in my university prepare people well to start their own businesses | | | | | |
| PV07 | | For me, it would be easy to start my own business | | | | | |
| PV08 | | For me, I do not see any problem to start my own business | | | | | |
| PV09 | | Starting my own business is, probably, the best way to take advantage of my education | | | | | |
| PV10 | | I am positive that I would be successful if I started my own business | | | | | |

**For each of the following possible ways of supporting the creation of existing business, indicate your level of knowledge as:**

No knowledge whatsoever (1) (2) (3) (4) (5) A lot of knowledge

| Items | Origin | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|
| PV11 | Autio et al. (1997) | Specific qualification for young entrepreneurs | | | | | |
| PV12 | | Specially favorable loans | | | | | |
| PV13 | | Technical assistance to start a business | | | | | |
| PV14 | | Business centers/networks | | | | | |
| PV15 | | Consultancy with favorable conditions | | | | | |
| PV16 | | Accessibility to the market with favorable conditions | | | | | |
| PV17 | | Favorable policies to start businesses | | | | | |
| PV18 | | Readily available opportunities to start new businesses | | | | | |

**V – The questions below aim at evaluating your actual intention to become an entrepreneur.**
Indicate your option as:

I entirely disagree (1) (2) (3) (4) (5) I entirely agree

| Items | Origin | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|
| EI01 | Zhao, Seibert, and Hills (2005) | I have the intention of starting and developing a business with high growth potential | | | | | |
| EI02 | | My professional objective is to become an entrepreneur | | | | | |
| EI03 | | I have been thinking seriously about starting a business | | | | | |
| EI04 | | I have the firm intention to start a business one day | | | | | |
| EI05 | | I will make all effort to start and run my own business | | | | | |

Indicate your option as:

Unlikely(1) (2) (3) (4) (5)Highly likely

| Items | Origin | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|
| EI06 | Kolvereid (1996) | What is the likelihood of you choosing a career as an independent entrepreneur? | | | | | |
| EI07 | Wouter (2004) | What is the likelihood of you starting your own business within the next year? | | | | | |
| EI08 | Krueger et al. (2000) | What is the likelihood of you starting your own business within the next 5 years? | | | | | |

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