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Determining factors of business students' entrepreneurial intention: a study from the perspective of the theory of planned behavior

Fatores determinantes das intenções de empreender dos acadêmicos da área de negócios: um estudo sob o enfoque da teoria do comportamento planejado

Factores determinantes de la intención emprendedora de los estudiantes de negocios: un estudio desde la perspectiva de la teoría del comportamiento planificado

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Abstract
The study investigated entrepreneurial intentions of business students in Brazilian federal universities. A questionnaire was applied to undergraduate students of administration, accounting, and economics resulting in 423 valid answers, analyzed using structural equation modeling. The results show that attitude and perceived behavioral control positively influence students' entrepreneurial intention, whereas the subjective norm did not influence entrepreneurial intention. From the subdivision of the sample into two groups (first semesters vs. last semesters), it was found that the subjective norm positively influenced entrepreneurial intention for students in the first semesters of the undergraduate program, while this relationship is not significant for students in the last semesters. These findings contribute to a deeper understanding of business students' entrepreneurial intention, and suggest improvement to entrepreneurial education.
Keywords: Entrepreneurship; Attitude; Behavioral Control; Theory of Planned Behavior

Resumo
O estudo teve por objetivo investigar as intenções empreendedoras dos acadêmicos da área de negócios de universidades federais brasileiras. Para a sua realização foi aplicado um questionário com os estudantes dos cursos de Administração, Ciências Contábeis e Economia de Universidades Federais do Brasil que resultou em 423 respostas válidas. Para análise utilizou-se a técnica de Modelagem de Equações Estruturais (MEE). Os resultados mostram que a atitude e o controle comportamental percebido influenciam positivamente na intenção dos acadêmicos em se tornarem empreendedores. Já a norma subjetiva não influenciou na intenção empreendedora. A partir da subdivisão da amostra em dois grupos (fases iniciais x fases finais), verificou-se que para acadêmicos no início do curso a norma subjetiva influenciou positivamente nas intenções de se tornarem empreendedores. Entretanto, para aqueles no final do curso a relação não foi significativa. Esses achados contribuem para uma melhor compreensão da intenção de empreender dos acadêmicos da área de negócios, e sugere maior aprimoramento da educação empreendedora.
Palavras-chave: Empreendedorismo; Atitude; Controle Comportamental; Teoria do Comportamento Planejado

Resumen
El estudio tuvo como objetivo investigar las intenciones emprendedoras de los académicos del área de negocios de las universidades federales brasileñas. Para su realización, se aplicó un cuestionario con los estudiantes de los cursos de Administración, Ciencias Contables y Economía de las Universidades Federales de Brasil que resultó con 423 respuestas válidas. Para el análisis se utilizó la técnica Structural Equation Modeling (SEM). Los resultados muestran que la actitud y el control conductual percibido influyen positivamente en la intención de los académicos de convertirse en emprendedores. La norma subjetiva no influyó en la intención emprendedora. A partir de la subdivisión de la muestra en dos grupos (fases iniciales x fases finales), se encontró que para los académicos al inicio del curso, la norma subjetiva influyó positivamente en las intenciones de emprender. Sin embargo, para aquellos al final del curso la relación no fue significativa. Estos hallazgos contribuyen a una mejor comprensión de la intención empresarial de los académicos en el área empresarial y sugieren una mayor mejora de la educación empresarial.
Palabras clave: Emprendimiento; Actitud; Control de Comportamiento; Teoría del comportamiento planificado

1 Introduction

Entrepreneurial initiatives aim to respond to social demands contributing to economic growth and job creation; therefore, it is important to understand the issues inherent to entrepreneurial intention and behavior (Landstrom & Harirchi, 2018; Audretsch et al., 2006). In this line, studies such as Tsordia and Papadimitriou (2015), Talbot et al. (2015), and Gieure et al. (2020) have shown that entrepreneurial education is a means of responding to social demands. Thus, increasing knowledge of how university students create expectations concerning entrepreneurial behavior is crucial, understanding more specifically how business programs can help students awaken the entrepreneurial spirit.

Entrepreneurial education awakens university students' potential to become entrepreneurs (Küttim et al., 2014). When considering that entrepreneurial actions bring unique contributions to society (Audretsch et al., 2006), it is crucial to understand the profile of business students, i.e., future managers (Jiang et al., 2017; Judge et al., 2019). Also, authors such as Lee and Wong (2004) and Gieure et al. (2020) argue that intention is one of the first steps in building potential entrepreneurs (Lee & Wong, 2004; Gieure et al., 2020). This study tries to explain entrepreneurial intentions by adopting the theory of planned behavior (TPB), which predicts that attitude, subjective norm, and perceived behavioral control influence individuals' intentions (Ajzen, 1991). For Ajzen (1991), the theory's core element is the individual's intention, suggesting that the stronger the intention, the greater the probability of the occurrence of a certain behavior.

Empirical studies have shown that attitude (Tsordia & Papadimitriou, 2015; Miranda et al., 2017; Doanh & Bernat, 2019; Jena, 2020), subjective norm (Astuti & Martdianty, 2012; Gieure et al., 2020; Tung et al., 2020; Tung et al. al, 2020), and perceived behavioral control (Yurtkoru et al., 2014; Mailoor et al., 2014; Ambad & Damit, 2016) positively influence students' intentions. Despite this evidence, little is known about how attitude, subjective norms, and perceived behavioral control can affect business students' entrepreneurial intentions. In addition, the literature shows that the knowledge about entrepreneurial intentions and the entrepreneurial behavior of business students is still limited (Fayolle & Liñán, 2014; Gieure et al., 2020). For Santos and Almeida (2018), exploring the subjective norm in the students' intentions is a priority, while Iwu et al. (2019) advocate the study of the effects of course and curriculum content on students' entrepreneurial intention. This research responds to these suggestions by investigating the entrepreneurial intentions of business students enrolled in Brazilian federal universities.

A survey was carried out with 423 undergraduate business students, particularly students of administration, accountability, and economy, and the analysis adopted structural equation modeling. Under the lens of TPB, the research demonstrates the importance of knowing the factors that influence the students' entrepreneurial intentions

As for the contributions of this study, it suggests that, in the Brazilian context, business students' attitudes are a determining factor in entrepreneurial intention. This evidence advances the literature on entrepreneurial education in business (Tsordia & Papadimitriou, 2015; Miranda et al., 2017; Doanh & Bernat, 2019; Jena, 2020). Another contribution lies in presenting opposing evidence to previous studies, as the subjective norm was not significant in predicting entrepreneurial intention. In addition, the university environment offers students opportunities (perceived behavioral control) that arouse entrepreneurial intention. Finally, the research contributes to the literature on TPB (Ajzen, 1991; Küttim et al., 2014; Iwu et al., 2019) by showing that the influence of the subjective norm on entrepreneurial intention is a reflection of social relationships. Thus, at the beginning of an undergraduate program, students are more likely to be influenced by external factors, while at the end of the course, the sense of autonomy is greater, and the subjective norm does not influence entrepreneurial intentions as much.

The research suggests greater improvement in entrepreneurial education and points out that business programs should pay attention to entrepreneurial issues. This is because offering courses that encourage entrepreneurial actions can be decisive for expanding the establishment of new businesses and

creating jobs and economic growth. The findings alert coordinators, professors, researchers, and other professionals to the importance of entrepreneurial education. The results show that the entrepreneurial spirit needs to permeate every moment of the student's education, being present in all courses – i.e., it should not be the topic of a single course taught in the first part of undergraduate programs as an elective course.

2 Theoretical Framework

2.1 Entrepreneurship

Several conceptualizations about entrepreneurship have been presented in the literature, focused mainly on understanding complex tasks (Baron & Shane, 2007). These studies adopted several approaches, among which entrepreneurial education stands out (Secundo et al., 2020). Entrepreneurship becomes a means to solve various social problems (Landstrom & Harirchi, 2018). Therefore, it has attracted the attention of scholars and practitioners (Teixeira & Nogueira, 2016).

Entrepreneurship is indispensable for economic growth, creating jobs, supporting the emergence of new products and sectors, introducing innovation, and stimulating competition and productivity (Audretsch et al., 2006). This is because it excels in understanding the opportunities for creating new ideas and how individuals innovate and explore them (Baron & Shane, 2007).

Entrepreneurship requires calculated risks; therefore, personal, environmental, and sociological factors motivate entrepreneurs (Baggio & Baggio, 2014). In the academic field, studies have elucidated that these factors directly affect entrepreneurial intentions (Rocha, 2012; Alves et al., 2016; Crestani et al., 2019; Iwu et al., 2019). Specifically, encouragement, participation in extracurricular activities, and the desire to continue with their studies influence students' entrepreneurial intentions (Rocha, 2012). In addition, the academic profile determines their level of participation in educational activities for entrepreneurship education (Alves et al., 2016) since students willing to create entrepreneurial projects and have the ability to do so are also more likely to create their own businesses (Rocha, 2012). Thus, students' confidence level in managing and solving problems must be satisfactory for them to actually become entrepreneurs (Crestani et al., 2019). Therefore, the role of education is recognized as a motivator for such behavior (Iwu et al., 2019).

2.2 Planned behavior and entrepreneurial intention

The theory of planned behavior (TPB) seeks to explain behaviors over which individuals have incomplete volitional control (Ajzen, 1991). The central element of TPB is the individual's intention to perform a certain action, considering motivational factors that influence behavior (Ajzen, 1991). Intentions indicate the level of effort individuals are willing to make to perform a specific behavior. Thus, attitudes toward behavior, subjective norm, and perceived behavioral control are determinants of behavioral intention (Ajzen, 1991).

Attitude toward behavior refers to the degree of personal assessment, which can be configured as positive or negative feelings of an individual about a certain behavior (Fishbein & Ajzen, 1975). The authors point out that an individual's attitude can change as a function of the variation of their beliefs and can be relatively stable over time or exhibit changes. Under the TPB lens, empirical studies have elucidated that attitude is related to intention (Kim et al., 2003; Pawlak et al., 2009; Hoppe et al., 2012; Palat & Delhomme, 2012; Sousa et al., 2013;).

Kim et al. (2003) show that attitude contributes to establishing an intention prediction model, while Hoppe et al. (2012) indicate that attitudes significantly influence intention. Palat and Delhomme (2012) point out that attitude is a significant predictor of behavior congruent with established rules, and Sousa et al. (2013) clarify that behavioral beliefs significantly influence behavioral intention and that students' decision to choose is based on beliefs and attitudes. Finally, Pawlak et al. (2009) observed that attitude had the greatest influence on intention among the TPB elements.

Research suggests that students' attitudes while performing educational activities reflect their intention to become entrepreneurs (Tsordia & Papadimitriou, 2015; Miranda et al., 2017; Doanh & Bernat, 2019; Jena, 2020). Tsordia and Papadimitriou (2015) explored the role of TPB in explaining the entrepreneurial intention of business students at a Greek university. The results proved the impact of attitude toward behavior in forming students' entrepreneurial intention. Miranda et al. (2017) revealed that among Spanish students, the main antecedent of entrepreneurial intention is the attitude toward entrepreneurship. Doanh and Bernat (2019) reported that Vietnamese students' attitudes toward entrepreneurship exert the greatest influence on entrepreneurial intention. Indian business students also realized that entrepreneurial education enables the positive and significant impact of attitude on entrepreneurial intention (Jena, 2020). Santos et al. (2021) conducted a study with 173 students and found that attitudes affect entrepreneurial intentions, which is evidence that attitude can predict students entrepreneurial intentions. Thus, the following research hypothesis is:

H1: Attitude positively influences undergraduate students' entrepreneurial intention.

Another element of TPB is the subjective norm, which according to Fishbein and Ajzen (1975), is related to the social pressure the individual perceives to manifest a certain behavior. Normative beliefs can be third-party support for individuals' decisions (Ajzen, 1991), i.e., the influence of family and friends, among others (Ajzen, 1991). Therefore, stronger subjective norms mean more salient intentions for a given behavior (Gieure et al., 2020).

Empirical evidence showed that subjective norms positively influence intentions (Talbot et al., 2015; Mendes Filho et al., 2017; Jiang et al., 2017; Judge et al., 2019). Specifically, Judge et al. (2019) demonstrated that the subjective norm is the strongest predictor of behavioral intentions. Jiang et al. (2017) identified psychosocial factors that influence individuals' decisions and realized that subjective norms, in which advice from family and friends stands out, are strong determinants of intentions. Mendes Filho et al. (2017) showed that subjective norms positively influence individuals' intentions to share information. Talbot et al. (2015) showed that the subjective norm is a strong element of intentions to provide care to other individuals.

Empirical studies in entrepreneurial education indicate that the subjective norm is decisive in students' entrepreneurial intention (Astuti & Martdianty, 2012; Gieure et al., 2020; Tung et al., 2020). For example, Astuti and Martdianty (2012) show that Indonesian students perceive the subjective norm as the strongest in predicting entrepreneurial intentions among the TPB elements. Gieure et al. (2020) observed whether university students have genuine intentions to start a business and consider themselves capable of doing so based on TPB. The authors demonstrated that the subjective norm strongly influences the university environment and determines students' entrepreneurial intention in 34 countries. From a comparative approach between university students in Vietnam and the Philippines, Tung et al. (2020) concluded that subjective norms positively influence entrepreneurial intentions. Thus, entrepreneurial behavior may strongly depend on other individuals, such as friends and family. The subjective norm can influence entrepreneurial intentions depending on the students' social relationships and groups. Thus, the second hypothesis is:

H2: The subjective norm positively influences undergraduate students' entrepreneurial intention.

The degree of perceived behavioral control is how easy or difficult it is for the subject to manifest a certain behavior, considering the resources and opportunities that facilitate manifesting a behavior with a high probability of success (Ajze, 1991). Santos et al. (2018) found that perceived behavioral control is associated with students' intentions to pursue a career in accounting. Dunn et al. (2018) found that behavioral control significantly determines intention in the academic environment. Studies have presented evidence supporting a positive relationship between perceived behavioral control and entrepreneurial intention (Yurtkoru et al., 2014; Mailoor et al., 2014; Ambad & Damit, 2016). Yurtkoru et al. (2014) reported that perceived behavioral control can predict entrepreneurial intention for Turkish students. Indonesian academics also understand that perceived behavioral control contributes to entrepreneurial intention (Mailoor, 2014). For Ambad and Damit (2016), Malaysian students realized that perceived behavioral control significantly impacted entrepreneurial intention. This evidence suggests that education emphasizing entrepreneurship affected students' entrepreneurial intentions. Thus, the third research hypothesis is:

H3: Perceived behavioral control positively influences undergraduate students' entrepreneurial intention.

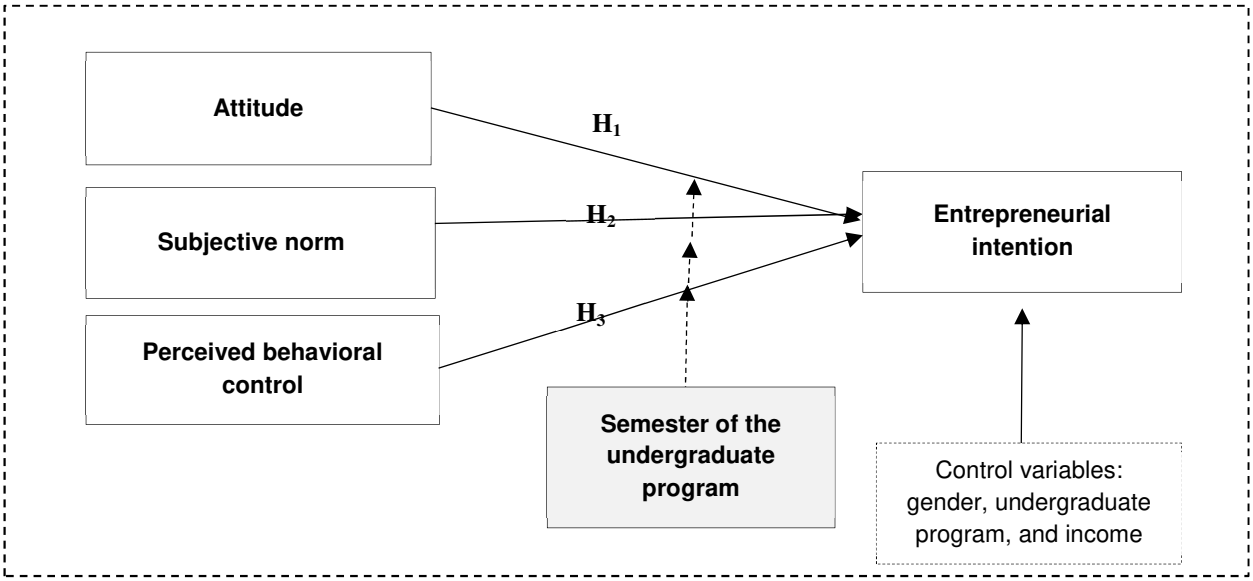
The research analyzes the relationship between attitude, subjective norm, and perceived behavioral control in entrepreneurial intention (hypotheses H1, H2, and H3, respectively). The moderation of the semester of the undergraduate program – group 1 (1^{st} – 4^{th} semester) and group 2 (5^{th} – 8^{th} semester) – is also analyzed in the relationship between attitude, subjective norm, and behavioral control and entrepreneurial intention. The impact of gender, undergraduate program (administration, accounting, and economics), and income (control variables) is also analyzed to see whether they affect the results. Based on the literature on TPB, Figure 1 presents the theoretical model and hypotheses.

3 Methodology

3.1 Sample, instrument, and data collection

This descriptive and quantitative research used a survey to collect data from university students enrolled in undergraduate programs of administration, accounting, and economics at 69 Brazilian federal universities. The study adopted a non-probabilistic sampling process because, although directed to undergraduate programs in business areas, it was not possible to obtain the number of students who received the link to access the survey. The scope of the study observing undergraduate programs of administration, accounting, and economics, and the absence of a consolidated list of students enrolled in these three areas of knowledge hindered the ability to determine the number of students forming the

research population. However, this aspect does not affect the analysis and is in line with other studies on the subject (e.g., Miranda et al., 2017; Santos et al., 2021).



Note: ------► Complementary analysis (without hypothesis)
Figure 1: Research Model
Source: Elaborated by the author (2020).

The elaboration of the questionnaire followed the procedures recommended by the survey literature (Dillman et al., 2014). The process established constructs validated in the literature (Bedford & Speklé, 2018). Pre-tests were conducted with five expert scholars, who offered suggestions such as improving some assertions.

The questionnaire was sent in two stages. The first stage involved collecting in person between November 4 and 14, 2019, resulting in 137 responses. In the second stage, the questionnaire was sent via google forms to the coordinators of the undergraduate programs in the business area (undergraduate programs in accounting, administration, and economics), asking them to forward it to students. This stage took place from May 4 to 23, 2020, and 286 valid responses were obtained, so the final sample was 423 respondents. As for the sample profile, the average age of the participants was 24 years, with a minimum age of 17 years and a maximum age of 58 years. Most participants (194) had income in the range of BRL 1,997 to BRL 2,994 on the data collection date. Most respondents were single (387), 208 were female, 213 were male, and 2 participants preferred not to respond.

3.2 Measurement of variables

The constructs used were attitude, subjective norm, perceived behavioral control, and entrepreneurial intention, all of them measured based on the study by Küttim et al. (2014) and supported by TPB scholars. The study considered the control variables age, income, and the student's undergraduate program, as mentioned below.

Attitude: The construct was based on Gul et al. (1989), Ahmed et al. (1997), Byrne and Willis (2005), Tan and Laswad (2006, 2009), Mbawuni and Nimako (2015), and Santos and Almeida (2018). An example of assertion measuring this construct asked students to indicate the degree of agreement regarding the availability of resources for entrepreneurship using a 7-point Likert scale.

Subjective norm: The scholars supporting this construct were Paolillo and Estes (1982), Tan and Laswad (2006, 2009), Byrne et al. (2012), Mbawuni and Nimako (2015), and Santos and Almeida (2018). For example, the students were asked to indicate, using a 7-point Likert scale, how much they care about the opinion of friends/colleagues, parents and other family members, and other individuals.

Perceived behavioral control: This construct consisted of 11 questions and was supported by Sugahara and Boland (2006), Karakaya et al. (2011), Mbawuni and Nimako (2015), and Santos and Almeida (2018). For example, in one of the statements, students were asked to indicate the degree of certainty when developing new products and services using a 7-point Likert scale.

Entrepreneurial intention: The construct was measured using five items, supported by Ajzen (1991), Azevedo and Sugahara (2012), and Mbawuni and Nimako (2015). In one of the statements, using a 7-point Likert scale, the students were asked to indicate their degree of agreement regarding the intention to become outstanding entrepreneurs.

The control variables were age, income, and the student's undergraduate program. They were

selected based on the literature that suggests that individuals' characteristics can affect their decisions (Gomez-Conde et al., 2019).

3.3 Data analysis

Data analysis used partial least squares structural equation modeling (PLS-SEM) and was carried out in the SmartPLS software version 3. The minimum of the sample was also estimated considering the effect size (mean effect of 0.15), the significance level of α = 5%, the power of the sample of 1-β = 0.8, and three predictors. The final sample of the survey was greater than 77 responses (minimum expected).

Additionally, the sample's possible biases were assessed through non-response bias and common method bias. Harman's single-factor test indicated the absence of the common method bias (Gomez-Conde et al., 2019), given that the explained variance of the first factor was inferior to 50%. The T-test for comparing the means showed no significant differences between the first and last respondents, which presuppose the absence of non-response bias. Of the first and last responses, 20% were compared and found to be similar to the non-participants (Gomez-Conde et al., 2019). The intervening effect (categorical moderation) of the semester the students were attending was assessed as a complementary analysis (the study did not test hypotheses for this item).

4 Analysis of results

4.1 Measurement model

The first step of structural equation modeling consists of analyzing the measurement model, which attests to the validity and reliability of the research constructs (Hair Jr et al., 2016). This process is evaluated by the operationalization of the PLS algorithm, in which Cronbach's Alpha (CA) assesses the reliability of the model and Average Variance Extracted (AVE) for the validity of the research (Hair Jr et al., 2016). Table 1 shows the results of the measurement model.

Table 1
Results of aggregated and segregated measurement model results

Panel A – Complete model = 423 students						
Constructs	CA	AVE	1	2	3	4
1.Attitude	0.893	0.760	**0.872**			
2.Perceived behavioral control	0.757	0.758	0.686	**0.765**		
3.Entrepreneurial intention	0.820	0.585	0.789	0.758	**0.934**	
4.Subjetive norm	0.951	0.872	0.068	0.074	0.063	**0.871**
Panel B – First semesters of the undergraduate program (1st – 4th = 175 students)						
Constructs	CA	AVE	1	2	3	4
1.Attitude	0.892	0.758	**0.871**			
2.Perceived behavioral control	0.798	0.561	0.671	**0.749**		
3.Entrepreneurial intention	0.942	0.851	0.788	0.779	**0.923**	
4.Subjetive norm	0.754	0.789	0.191	0.165	0.258	**0.888**
Panel C – Last semesters of the undergraduate program (5th – 8th = 248 students)						
Constructs	AC	AVE	1	2	3	4
1.Attitude	0.894	0.762	**0.873**			
2.Perceived behavioral control	0.833	0.602	0.696	**0.776**		
3.Entrepreneurial intention	0.957	0.886	0.789	0.746	**0.941**	
4.Subjetive norm	0.760	0.806	-0.035	-0.001	-0.078	**0.898**
Max.VIF	1.891					
R-squared	0.712					
Adjusted R-squared	0.709					
Chi-squared	0.581					

Note: The sample was separated into groups to help comprehend the similarities and differences in the entrepreneurial behavior between students in the first and last semesters of the undergraduate programs.

The measurement model was presented both in an aggregated and disaggregated form to verify the validity and reliability of the constructs, both of the general model (to meet the research hypotheses) and of the subgroups (due to the sensitivity analysis). The constructs were reliable both in the general model and subgroups, as CA was above the threshold of 0.70 (Hair Jr. et al., 2016). The results for convergent validity confirmed the constructs' validity since AVE was above the threshold of 0.50 in all cases (Hair Jr et al., 2016). The discriminant validity was confirmed using the Fornell and Larcker criterion, which points to the distinction between the items in the constructs (Hair Jr et al., 2016).

In addition, the absence of multicollinearity was identified, as the inner and outer VIF were less than

5.0. The model shows the R^2 is equivalent to 70%, so the attitude, subjective norm, and perceived behavior control explain 70% of the undergraduate students' entrepreneurial intentions. The Q^2 demonstrated the model's accuracy since it was representative (50%).

4.2 Structural model

In the structural model, the path diagram allows for rejecting or confirming the hypotheses. In this sense, we used 5,000 subsamples with a bias-corrected significance level of 5% (Hair Jr et al., 2016). Table 2 shows the relationships between the constructs.

Table 2
Relationships between constructs

Relationships	Complete model			
	B	T-value	p-value	Hypoteses
Attitude → Intention	0.508	12.520	0.000***	H1
Subjective norm → Intention	-0.001	0.052	0.958	H2
Perceived behavioral control → Intention	0.410	10.187	0.000***	H3

Note: **p<0.05; ***p<0.01.

In the first hypothesis, attitude positively influences the students' entrepreneurial intention. The hypothesis was confirmed because a positive relationship was found at a significance level of 1% (β=0.508; p<0.01). These findings indicate that the attitudes of business students are intrinsic resources that determine their intention to become entrepreneurs. As stated (Ajze, 1991), attitudes are indicators of the individual's level of effort. Therefore, they positively affect entrepreneurial intention.

The second hypothesis stated that the subjective norm positively influences undergraduate students' entrepreneurial intention. The results showed that the subjective norm was negative, rejecting the hypothesis (β=-0.001, p=0.958). For Fishbein and Ajzen (1975), the subjective norm is linked to the social influence perceived by individuals, referring to the manifestation of a specific behavior. Therefore, it is inferred that students either receive low external influence or give little importance to other opinions, for example, from friends and colleagues.

The third hypothesis stated that perceived behavioral control positively influences undergraduate students' entrepreneurial intention. The findings show that perceived behavioral control positively influenced the students' entrepreneurial intention (β=0.410; p<0.01) at the significance level of 1%, which confirms the hypothesis. According to Ajzen (1991), perceived behavioral control influences entrepreneurial intention because it reflects the individual beliefs regarding their facility or difficulty in manifesting a specific behavior.

4.3 Sensitivity analysis

Additional analysis was carried out considering the differences between the students in the first (1st to 4th) and last (5th to 8th) semesters of the undergraduate programs. Permutation and PLS-MGA analyses were performed. These analyses identified whether or not there were significant differences between the groups. Table 3 shows the results of invariance measurement testing (MICOM).

Table 3
Results of invariance measurement testing (MICOM)

Composite	**Correlation c *value* (=1)**	**[5%]**	**Permutation p-value**	**Compositional invariance**
Attitude	1.000	0.999	0.705	Yes
Behavioral control	0.999	0.995	0.475	Yes
Intention	1.000	1.000	0.051	Yes
Subjective norm	0.990	0.138	0.871	Yes
Composite	**Diff –Average (First - Last)**	**[2.5%; 97.5%]**	**Permutation p-value**	**Equal averages**
Scalar invariance				
Attitude	0.126	[-0.202;0.197]	0.209	Yes
Behavioral control	0.079	[-0.190;0.193]	0.439	Yes
Intention	0.143	[-0.197;0.193]	0.155	Yes
Subjective norm	0.060	[-0.195;0.195]	0.532	Yes
Composite	**Diff - Variance (First - Last)**	**[2.5%; 97.5%]**	**Permutation p-value**	**Equal variances**
Attitude	-0.110	[-0.266;0.251]	0.384	Yes
Behavioral control	-0.062	[-0.227;0.222]	0.584	Yes
Intention	-0.105	[-0.195;0.182]	0.283	Yes
Subjective norm	-0.045	[-0.231;0.228]	0.703	Yes

Note: 5000 Permutations; two-tailed at 0.05 significance

The measurement model confirmed the validity of the constructs. Once this requirement was observed, the study sought to ensure the constructs' invariance through invariance measurement testing (MICOM) (Henseler et al., 2016). As the variances were equal, it was possible to carry out the MGA analysis (Calvo-Mora et al., 2016). The results showed equal variances (the permutation p-value was not significant, i.e., P>0.05), meeting the MICOM criterion. After that, the PLS-MGA and the significance of the permutation were analyzed (Table 4).

Table 4
Permutation and multigroup analysis between constructs

Relationship	First semesters (First)=**175**			Last semesters (Last) =**248**			PLS-MGA P-Henseler	Permutation test
	B	**T-value**	**p-value**	**β**	**T-value**	**p-value**	**Diff(p-value)**	**Diff(p-value)**
H_1: ATT→INT	0.469	9.678	0.000	0.520	8.442	0.000	0.051 (0.742)	-0.051(0.542
H_2: SN→INT	0.095	2.307	0.021	-0.059	1.449	0.148	0.154 (0.005*)	0.154(0.005*)
H_3: PBC→INT	0.449	9.423	0.000	0.384	6.253	0.000	0.066(0.200)	0.066 (0.443)

Note: ATT=Attitude; SN=Subjective norm; PBC=Perceived behavioral control; INT=Intention
P-Henseler <0.05 or > 0.95*
Permutation test p<0.05*

Table 4 shows the differences between the groups concerning H2. The differences occurred because the students attending the first semesters of the undergraduate programs perceived a positive and significant influence of the subjective norm in entrepreneurial intention, different from those attending the last semesters. These students perceived that subjective norm did not influence (or negatively influenced) entrepreneurial intention (CI: β=0.095; p<0.05; Last: β=-0.059; P=0.148). These differences were confirmed by the PLS-MGA test (Diff-First-Last: β=0.154; p<0.05*), which showed significant differences between the groups, similarly, in the permutation test (Diff.First-Last: β=0.154; P<0.05*), thus reinforcing the differences already observed.

The effect of the control variables on the relationships was also evaluated. The variables, gender, undergraduate program, and income, helped interpret data (Table 5).

Table 5
Results of the analysis of the control variables

Relationships	**Gender**		**Undergraduate program**			**Income**	
	Male N=213	**Female N=208**	**Account N=261**	**Adm N=69**	**Econ N=93**	**Less than or equal to BRL 2,994.00 N=341**	**More than BRL 2,994.00 N=82**
	β (p-value)	**β (p-value)**	**β (p-value)**	**β (p-value)**	**β (p-value)**	**β (p-value)**	**β (p-value)**
ATT→INT	0.499 (0.000***)	0.533 (0.000***)	0.470 (0.000***)	0.609 (0.000***)	0.537 (0.000***)	0.517 (0.000***)	0.463 (0.000***)
SN→INT	-0.014 (0.729)	0.032 (0.391)	-0.007 (0.864)	-0.001 (0.986)	0.012 (0.845)	0.023 (0.471)	-0.076 (0.278)
PBC→INT	0.442 (0.000***)	0.371 (0.000***)	0.436 (0.000***)	0.354 (0.000***)	0.386 (0.000***)	0.401 (0.000***)	0.443 (0.000***)

Note: ATT=Attitude; SN=Subjective norm; PBC=Perceived behavioral control; INT=Intention
**p<0.05; ***p<0.01. Income=BRL 2,994.00 or three minimum wages in 2019 (date of data collection).

Regarding gender, both male and female students considered that attitudes and perceived behavioral control affected entrepreneurial intentions. As for the subjective norm, male students perceived it to have a negative influence, whereas female students perceived the opposite. However, this control variable did not significantly influence entrepreneurial intention.

Regarding the undergraduate programs the students were attending at the time of the research, attitude and perceived behavioral control determined the students' entrepreneurial intention, while the subjective norm did not influence entrepreneurial intention. Interestingly, the relationship between the subjective norm and the entrepreneurial intention was negative for students attending accounting and administration programs and positive for students of economics. As for income, lower-income students were more receptive to external influences (friends and others) than higher-income students, although statistical significance was not confirmed.

5 Discussion

In summary, the results of this study confirm that attitude and perceived behavioral control influence

the entrepreneurial intentions of business students. Figure 2 summarizes the statistical findings.

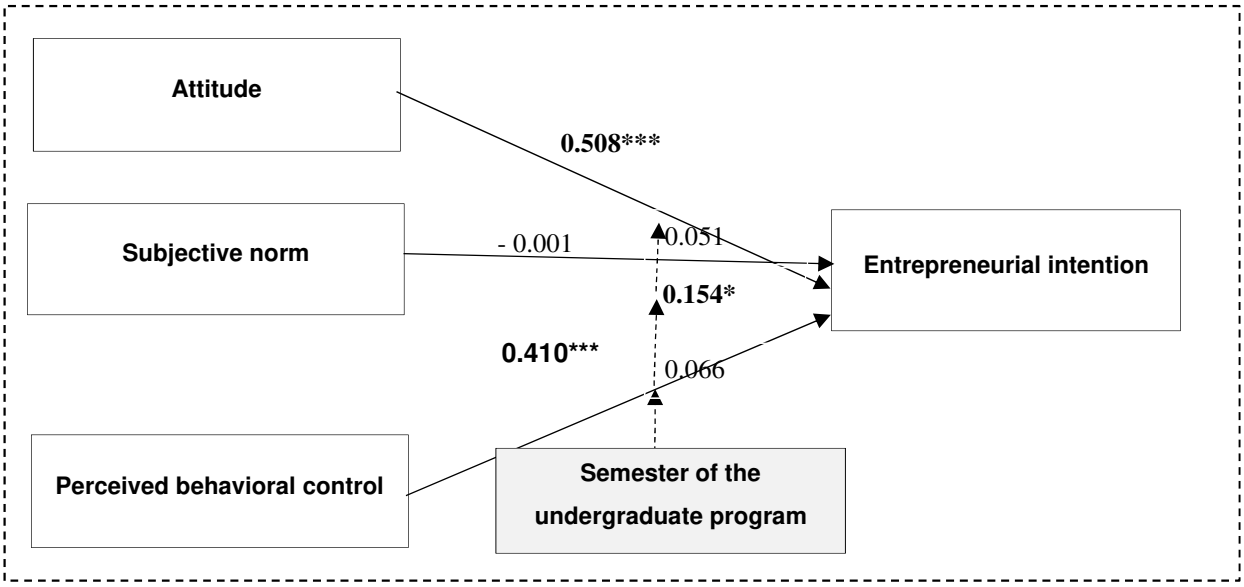


Figure 2 – Synthesis of results

The confirmation of H1 can be explained by the fact that students in the business area find more advantages than disadvantages in being an entrepreneur (Küttim et al., 2014) and consider entrepreneurship a promising career opportunity. Thus, both students in the first and last semesters of the undergraduate programs present attitudes congruent with entrepreneurial intention. Similar evidence was observed with Brazilian (Santos et al., 2021), Vietnamese (Doanh & Bernat, 2019), Spanish (Miranda et al., 2017), and Greek (Tsordia & Papadimitriou, 2015) business students. This finding also suggests that attitude – amidst the elements of the TPB – is a strong determinant of entrepreneurial intention and behavior since students appreciate the entrepreneurship career (Küttim et al., 2014), and this career requires attitudes and autonomy from individuals. The results corroborate Hoppe et al. (2012) by indicating that attitude significantly influences intention. This perception of the positive and significant impact of attitude on entrepreneurial intention is unanimous for male and female students attending undergraduate accounting, administration, and economics programs, regardless of their income.

H2 was rejected since students gave little importance to the opinions of friends/colleagues (Küttim et al., 2014). These opinions did not exert sufficient influence on most students and did not affect entrepreneurial intention, which conflicts with previous studies that suggested that the subjective norm influences intention (e.g., Talbot et al., 2015; Jiang et al., 2017; Judge et al., 2019). The culture of the countries where these studies were conducted may be one of the explanations for this discrepancy. For example, Astuti and Martdianty (2012) found that the subjective norm is the strongest predictor of entrepreneurial intentions for Indonesian students. The same occurred with students from Vietnam and the Philippines (Tung et al., 2020).

The multigroup analysis showed different perceptions between students attending the first and last semesters of the undergraduate programs regarding the impact of the subjective norm on entrepreneurial intention. Opinions of friends, colleagues, and family members influence entrepreneurial intention for students in the first semesters. On the other hand, students in the last semesters tend to be more autonomous, present their own ideas, and do not consider an external opinion so much, which means that these opinions do not influence entrepreneurial intention.

The results confirmed H3, where students believe they have the ability to develop new products and services, reducing risks and uncertainties (Küttim et al., 2014). The researched undergraduate students demonstrated confidence in their ability to start a business and lead it to success, in addition to the intention of becoming outstanding entrepreneurs. These results agree with Santos et al. (2018), who found that perceived behavioral control influences the students' entrepreneurial intention. They are especially in line with other studies that have reported a positive association between a high degree of perceived behavioral control and entrepreneurial intention (Yurtkoru et al., 2014; Mailoor et al., 2014; Ambad & Damit, 2016). The findings also corroborate studies that revealed that Turkish (Yurtkoru et al., 2014), Indonesian (Mailoor et al., 2014), and Malaysian (Ambad & Damit, 2016) students consider that universities should offer courses promoting entrepreneurial intention. When carrying out complementary analyses with control variables such as gender, undergraduate program, and income, the results remained positive and significant.

Therefore, these findings showed that business students present attitudes and a perceived behavioral control that determine their intention to become entrepreneurs. However, the subjective norm, in general, was not enough to predict entrepreneurial intention, suggesting that little attention has been paid to

external opinions, especially in the case of students attending the last semesters of the undergraduate program.

6 Conclusion

The study aimed to investigate the entrepreneurial intention of undergraduate students in the business area from the perspective of the theory of planned behavior (TPB). The research surveyed students attending administration, accounting, and economics programs at Brazilian federal universities. Evidence suggested that attitude positively influences the students' entrepreneurial intention, confirming the first hypothesis. On the other hand, the second hypothesis was rejected since the subjective norm did not influence entrepreneurial intention, i.e., students were not subjected to the influence of external opinion to determine entrepreneurial intention. Regarding perceived behavioral control, a positive and significant influence was observed, which confirms the third hypothesis.

The research suggests that education for business students intensifies entrepreneurial intention. It offers theoretical implications to the literature on entrepreneurial education in the business area, joining the research of Tsordia and Papadimitriou (2015), Miranda et al. (2017), Doanh and Bernat (2019), Jena (2020), Yurtkoru et al. (2014) Mailoor et al. (2014), and Ambad and Damit (2016). It also contributes to the literature by indicating that attitude and perceived behavioral control positively influence students' entrepreneurial intention. It was noteworthy that students in the last semesters of undergraduate programs did not consider the opinions of friends, colleagues, and family regarding entrepreneurship, so it was demonstrated that the subjective norm did not influence their entrepreneurial intention. This result may bring new insights for future studies, in addition to contributing to the literature based on TPB (Ajze, 1991; Küttim et al., 2014; Iwu et al., 2019).

As for practical implications, these findings support coordinators of undergraduate programs in the business area so they can work to ensure students access the necessary knowledge to become entrepreneurs. In addition to stimulating the improvement of entrepreneurship education in universities, developing entrepreneurial intention in students contributes, among others, to academic success and the leverage of the economy with the generation of revenue and jobs.

Thus, the research results clarify factors influencing entrepreneurial intention in undergraduate administration, economics, and accounting students. It provides subsidies concerning aspects that can be improved to stimulate entrepreneurship. This study's findings may help authorities understand the variables influencing entrepreneurial intention, so they can work toward developing education programs more aligned with the market. For Brazilian universities, another possible action would be to develop actions aimed at supporting the practice of entrepreneurship to increase students' interest and knowledge. It is recommended that those responsible for the curriculum of business programs rethink undergraduate programs and seek to integrate entrepreneurial education and training within the university context since entrepreneurial training can be part of the objectives of different courses of the curriculum without being a specific course of the undergraduate program.

This study is limited to undergraduate students. However, entrepreneurial intentions may predict future behavior, but the students' perceptions can change once they graduate, gain professional experience, or start a business. Consequently, future research can explore the relationship between the constructs proposed in this study with a sample of alumni of these programs who already have a professional life. This research adopted the suggestions of Küttim et al. (2014), who presented three elements as a measurement of the subjective norm. We considered only two of these elements in this study due to the low factor loading. Thus, future research could adopt the influence of relatives and other family members as a third variable to understand how it affects students' entrepreneurial intention. It is also recommended that future studies explore the types of contracts students have when reporting the source of income (whether labor contracts or internship agreements, for instance), observing if this element influences entrepreneurial intention.

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