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THE DETERMINING FACTORS OF ENTREPRENEURIAL INTENTION IN THE BRAZILIAN CONTEXT

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ABSTRACT

This study analyzes the influence of family entrepreneurs and sustainable and innovative behavioral constructs on the entrepreneurial intention of university students. The theoretical-methodological bases of Liñán and Chen (2009) were adopted for entrepreneurial intention and entrepreneurial family members; of Gonçalves-Dias et al. (2009) related to sustainable behavior; and Foxall and Hackett (1992) referring to innovative behavior. It is a quantitative study, based on a survey conducted among 285 undergraduate business administration students at a public university in Brazil. The data were submitted to factor analysis, logistic regression and classification and regression tree (CART) analysis. The results showed: (i) there is an influence of family entrepreneurs on the entrepreneurial intention of university students; (ii) there is an influence of sustainable behavior on the entrepreneurial intention of university students; and (iii) there is an influence of innovative behavior on the entrepreneurial intention of university students. The results contribute to the empirical and conceptual literature on innovation and sustainability in the context of entrepreneurship. Although the literature on entrepreneurial intention is extensive, both in Brazilian and international databases, no studies were found that would allow the alignment of innovation and sustainability in the entrepreneurial intention of university students, which is the fundamental innovation of this study.

Keywords: Sustainable Behavior; Innovative Profile; Entrepreneurial Intention; Influence of Family Entrepreneurs; Entrepreneurship.

1 INTRODUÇÃO

Entrepreneurship is considered essential for a country's economic and social development (Borges, Fillion, & Simard, 2012; Acs, Szerb, & Lloyd, 2017), and it can be fundamental for poverty reduction and sustainable development (Degen, 2008; Licht, Oliveira & Ventura, 2007). Entrepreneurship, when directed towards sustainable development, is based on the "triple bottom line" (Elkington, 1997; 2013), aligning economic, social and environmental aspects. Entrepreneurial intention is essential and widely discussed to understand and explain the process of forming new businesses (Krueger, 2017), and is the leading phenomenon to understand entrepreneurship (Bird, 1988; Fayolle & Gailly, 2015; Liñán & Chen, 2009; Nabi, Walmsley, Liñán, Akhtar, & Neame, 2018). It can be directly influenced by the family context (Sieger & Minola, 2017; Zampetakis, Bakatsaki, Litos, Kafetsios, & Moustakis, 2017), according to the theory of planned behavior proposed by Ajzen (1991).

Entrepreneurial intention is related to entrepreneurship, being an intrinsic process of the individual (Kautonen, Van Gelderen, & Fink, 2015; Liñán & Chen, 2009). Ajzen (1991) emphasized that intention comes before the real behavior of entrepreneurship, which involves the creation or expansion of a certain business. Carvalho and González (2006), Liñán and Chen (2009), Thompson (2009), Teixeira and Davey (2010), Fayolle and Gailly (2015) and Ferreira, Loiola and Gondim (2017) all pointed to numerous models based on entrepreneurial intention, with focus on trying to predict potential entrepreneurs.

Entrepreneurs are innovative people, capable of proposing creative and original solutions to problems and making decisions in complex and uncertain contexts (Soomro & Shah, 2015), in addition to knowing how to face and overcome risks (Licht et al., 2007). Furthermore, the theory of adaptation-innovation, proposed by Kirton (1976) has been examined in research that tries to identify innovative behavior, through cognitive styles (information processing), in the context of entrepreneurship, such as Goldsmith and Kerr (1991), Marcati, Guido and Peluso (2008), Ahmed et al. (2010), Wurthmann (2014), Soomro and Shah (2015) and Kollmann, Stöckmann, Meves and Kensbock (2017).

Sustainability also complements entrepreneurship, based on aspects related to environmental protection, since entrepreneurs can directly or indirectly impact the environment, making it pertinent for them to incorporate sustainable and original practices in business creation (Boszczowski & Teixeira, 2012). For a company to be environmentally

friendly, entrepreneurs must be aware of the impact of their actions and attitudes on the environment (Belz & Binder, 2017; Dentchev et al., 2016; Kuckertz & Wagner, 2010). In addition, growing public concern over the occurrence of environmental changes caused by industrial activity means that companies that have sustainable policies and seek to reduce their impact on the environment have a competitive advantage (Palma, Gomes, Kneipp & Rosa, 2014).

Considering the approaches that contextualize the influence of family members on the formation of entrepreneurial intention as well as innovation and sustainability, the following question was defined for this study: How does the influence of family members, sustainability and innovation influence entrepreneurial intent? Thus, this study analyzes the influence of family entrepreneurs and sustainable and innovative behavioral constructs on the entrepreneurial intention of university students.

Due to the growing number of studies on the high level of entrepreneurial intention of university students (Ferreira, Loiola, & Gondim, 2017; Liñán & Chen, 2009), it is important to understand how innovative and sustainable behavior in the context of entrepreneurship occurs, to improve understanding of the alignment of innovation-entrepreneurship-sustainability, considering intentional and behavioral perspectives.

In addition to this introductory section, the study has four more sections. The next section deals with the development of hypotheses, covering aspects related to entrepreneurial intention and the influence of family members on the formation of entrepreneurial intention and sustainable and innovative behavior. The third section describes the methodological procedures of the investigation, then analyzes and discusses the results. Finally, the conclusions are presented, with suggestions for future research.

2 LITERATURE REVIEW AND HYPHOTESES

2.1 Entrepreneurial Intention

Studies and discussions about entrepreneurial intention have been gaining visibility and relevance, starting in the last two decades of the 20th century, such as the works of Shapero and Sokol (1982) and Davidsson (1995), and continuing this century with Carvalho and González (2006), Liñán and Chen, (2009), Teixeira and Davey (2010), Bae, Qian, Miao and Fiet (2014), Fayolle and Gailly (2015), Ferreira et al. (2017), Krueger (2017) and Passaro, Quinto and Thomas (2018).

In addition, Shapero's seminal works mark the crucial point of research regarding entrepreneurial intention (Shapero & Sokol, 1982). So, researchers in the field of entrepreneurship studies recognized the importance of entrepreneurial intention as a key to understanding the process of creating companies (Bird, 1988), as well as the intrinsic aspects of future entrepreneurs (Hockerts, 2017; Thompson, 2009). With the evolution of the literature on entrepreneurial intention, some theories were considered important to explain entrepreneurial intention (Autio, Keeley, Klofsten, Parker, & Hay, 2001; Gorgievski, Stephan, Laguna, & Moriano, 2018).

The theory of rational action of Ajzen and Fishbein (1977) was the forerunner in the attempt to predict and explain behavior and triggered the theory of entrepreneurial intention of Shapero and Sokol (1982) and the theory of planned behavior (TPB), proposed by Ajzen (1991). These theories are characterized as dominant models that try to explain entrepreneurial intention. Since the 1990s, TPB (Ajzen, 1991) has been a reference in the field of studies related to entrepreneurship. It is possible through this theory and its approaches to understand beliefs and behaviors (De Leeuw et al., 2015) that are predictors of entrepreneurial intention (Gorgievski et al., 2018; Krueger, 2017; Liñán & Chen, 2009).

Shapero and Sokol (1982) also emphasized the importance of the empirical literature on entrepreneurship and entrepreneurial intentions, as well as the recognition of models and theories, such as TPB, that seek to identify and explain the entrepreneurial intention phenomenon (Krueger & Carsrud, 1993). In addition, Fayolle and Liñán (2014) and Schlaegel and Koenig (2014) stressed that the intention is essential when it comes to entrepreneurship. The intention before entrepreneurial behavior refers to a predisposition to create or expand a company, and it can be influenced by numerous factors, such as time, family context, innovative bent of mind, financial resources and competence, among others (Teixeira & Davey, 2010).

The family context is considered to influence the propensity to entrepreneurship, since parents who are entrepreneurs can contribute to their children's entrepreneurial intention (Altinay, Madanoglu, Daniele, & Lashley, 2012; Teixeira & Davey, 2010). According to the investigations carried out by Carvalho and González (2006), Liñán and Chen (2009), Sánchez (2011), Bae et al. (2014), Fayolle and Gailly (2015), Randerson, Bettinelli, Fayolle and Anderson (2015) and Wang, Wang and Chen (2018), parents exert a strong influence on their children's entrepreneurial intention. Also, considering the perspective of the theory of planned behavior, Ajzen (1991) and Steinmetz, Knappstein, Ajzen, Schmidt and Kabst (2016) emphasized that the social context in which individuals live, like the family, directly impacts the formation of entrepreneurial intention. Innovation and entrepreneurship are intrinsically

related. In some low-income markets, for example, it is essential to solve sustainability challenges to introduce simple and sustainable products and processes (Nogami, Vieira & Veloso, 2018). As a result, we have the following hypothesis: **H₁**: The existence of family entrepreneurs influences the entrepreneurial intention of university students.

2.2 Sustainable Behavior

Sustainable behavior, widely discussed in environmental psychology (Corral-Verdugo & Pinheiro, 1999), is related to concern about the environment (Günther, Pinheiro, & Guzzo, 2004). Studies related to environmental aspects are relatively recent, and can be characterized as multidisciplinary and transdisciplinary, which challenging researchers by their multiple and diverse approaches (Pato & Tamayo, 2006), such as consumption, concern over garbage and boycott via consumption, among others (Gonçalves-Dias, Teodósio, Carvalho, & Silva, 2009; Hörisch, Kollat, & Brieger, 2017).

There has been strong growth in academic research related to environmental issues, which seek to identify the profile of individuals considered to be ecologically or environmentally conscious. However, demographic variables alone are not sufficient to investigate this profile, thus requiring a broader contextual characterization to measure individuals' environmental behavior (Arnocky, Milfont, & Nicol, 2014; Günther, Pinheiro, & Guzzo, 2004; Straughan & Roberts, 1999).

In relation to sustainable behavior, problems related to the environment are becoming research concerns (Griskevicius, Cantú, & Vugt, 2012), to find explanations for the causes of environmental problems, in addition to the direct impact of individuals' behavior on the environment (Gonçalves-Dias et al., 2009; Sallis, Owen, & Fisher, 2015). Sustainable behavior, from the perspective of individuals' concern with environmental issues, is also aligned with social and cultural issues (Arnocky, Milfont, & Nicol, 2014; Pato & Tamayo, 2006; Gonçalves-Dias et al., 2009). According to Kuckertz and Wagner (2010), entrepreneurial behavior oriented to sustainability is based on the assessment that entrepreneurs make of the impacts of their actions on the environment (Gonçalves-Dias et al., 2009).

When considering the theoretical-methodological perspective of Straughan and Roberts (1999), and especially of Gonçalves-Dias et al. (2009), here we try to elucidate sustainable behavior through the constructs: (i) engaged consumption, involving individuals' awareness of environmental issues regarding manufacturers' stances and the desire for ecologically correct products; (ii) concern over waste, referring to garbage and cleaning of domestic and public

spaces; (iii) boycott via consumption, related to consumption with the attitude of individuals to penalize ecologically incorrect products; (iv) mobilization, a proactive stance in the search to raise awareness of environmental issues; and (v) domestic environment, daily use of natural resources such as water and electricity.

From the perspective of the conceptual and empirical literature on entrepreneurship and sustainable behavior, we formulated another hypothesis: **H₂**: Sustainable behavior exerts an influence on the entrepreneurial intention of university students.

2.3 Adaption-Innovation Theory

The theory of adaptation-innovation, proposed by Kirton (1976), states that people can propose creative and original solutions for the market when they are directly involved through creativity and innovation. Empirical research involves the application of adaptation-innovation theory to identify potential entrepreneurs, such as the studies by Ahmed et al. (2010), Kuckertz and Wagner (2010), Wurthmann (2014), Soomro and Shah (2015) and Kollmann et al. (2017).

This theory posits that cognitive styles are the individual differences in the preference to obtain, organize and use information to make decisions and promote organizational, personal and social changes (Kirton, 1976; Marcati, Guido, & Peluso, 2008; Stum, 2009). Stum (2009) also discussed the influence of globalization on organizations, as far as they promote people's ability to deal with social and market changes. Taylor (1989) clarified that the propensity for individuals to make decisions and solve problems, through cognitive abilities, is part of behavior that is more innovative than adaptive.

Kirton (1976) considered two styles in the adaptation-innovation theory: adaptive ("doing things better") and innovative ("doing things differently"), with the two forming a continuum. Given this perspective, according to this theory, the most innovative individuals are more creative, original and dynamic than adapters, who do only the best things, but not differently. Innovative leaders and entrepreneurs can directly impact the economic, social and environmental aspects of a country. Thus, adaptation-innovation theory seeks to balance the cognitive styles of each person (Stum, 2009; Taylor, 1989), using scales to explain the multidimensional cognitive nature of the adaptive and innovative styles (Foxall & Hackett, 1992; Kollmann et al., 2017; Taylor, 1989).

Rauch et al. (2009) emphasized innovation in the literature through risk-taking and creativity, or at least the predisposition of these constructs so that, through the propensity to innovate, individuals can act and make decisions in response to the uncertainties and risks

existing in the market. In view of studies related to organizational behavior associated with the individuals' propensity to innovate, Kirton (1976), Taylor (1989), Hauser, Tellis and Griffin (2006) and Soomro and Shah (2015) showed to what extent individuals can be innovative, creative and determined in performing different problem-solving activities. For that, they need to have a creative and innovative personality. Thus, one more hypothesis emerges, by aligning innovative behavior with entrepreneurial intention: **H₃**: Innovative behavior exerts an influence on the entrepreneurial intention of university students. Table 1 summarizes our hypotheses, relating the constructs and their respective theoretical bases.

Table 1. Summary of hypotheses

Constructs	Hypotheses	Theoretical bases
Enterprising family	H₁ : The existence of family entrepreneurs influences the entrepreneurial intention of university students.	Ajzen (1991), Carvalho and González (2006), Liñán and Chen (2009), Teixeira and Davey (2010), Sánchez (2011), Bae et al. (2014), Fayolle e Gailly (2015), Randerson et al. (2015), Steinmetz et al. (2016), Wang et al. (2018), Zampetakis et al. (2017), Gorgievski et al. (2018).
Sustainable behavior	H₂ : Sustainable behavior exerts an influence on the entrepreneurial intention of university students.	Straughan and Roberts (1999), Pato and Tamayo (2006), Gonçalves-Dias et al. (2009), Kuckertz and Wagner (2010), Arnocky et al. (2014), Sallis, Owen and Fisher (2015), Hörisch et al. (2017).
Innovative behavior	H₃ : Innovative behavior exerts an influence on the entrepreneurial intention of university students.	Kirton (1976), Foxall and Hackett (1992), Marcati et al. (2008), Stum (2009), Kuckertz and Wagner (2010), Wurthmann (2014), Soomro and Shah (2015), Kollmann et al. (2017).

Source: Prepared by the authors.

3 METHODOLOGICAL PROCEDURES

This study is quantitative and descriptive in nature (Collis & Hussey, 2005). The method to obtain the data was a survey (Hair, Black, Babin, Anderson, & Tatham, 2009). The population was composed of business majors at a public university located in a state in northeastern Brazil, considered the best university of the North and Northeast regions among public and private institutions, according to the national ranking released in 2017 by the Ministry of Education. The business administration course was chosen since it is an area of studies and practices involving entrepreneurship (Paço, Ferreira, Raposo, Rodrigues, & Dinis, 2011). Business students are more likely to be aware of environmental issues in the context of entrepreneurship (Ferreira et al., 2017; Han & Kim, 2010; Paço et al., 2011). At the investigated university, there are approximately 900 students. Therefore, the sample of 285 individuals was considered relevant to represent the population, because the sample size is satisfactory to produce results with a 95% confidence level (5% margin of error). The data were collected in person with all the individuals who answered the questionnaire, between August and December 2016.

The research instrument was structured with a set of items scored on a five-point Likert scale, except for entrepreneurial intention, which had a dichotomous variable ("yes/no"), indicating whether the respondent was entrepreneur (Liñán & Chen, 2009). For sustainable behavior, the scale ranged from 1 "never" to 5 "always" (Gonçalves-Dias et al., 2009), while in relation to innovative behavior, it ranged from 1 "totally disagree" to 5 "totally agree" (Foxall & Hackett, 1992) (Table 2).

Table 2. Variables of the model adopted in the study

Constructs	Item	Statement
Entrepreneurial Intention	EI	I intend to start a business in the next five years.
Sustainable Behavior	SB1	I have already paid more for environmentally friendly products.
	SB2	I try to buy products made from recycled material.
	SB3	I have already convinced other people not to buy products that harm the environment.
	SB4	Concerns about the environment influence my purchasing decisions.
	SB5	I read the label carefully before deciding to purchase.
	SB6	When there is no trash can, I keep the paper I no longer want in my pocket.
	SB7	I avoid throwing paper on the ground.
	SB8	I help to keep the streets clean.
	SB9	I buy products from a company even though I know it pollutes the environment.
	SB10	I avoid using a product manufactured by a company that pollutes the environment.
	SB11	I talk about the importance of the environment with other people.
	SB12	I mobilize people for the conservation of public spaces.
	SB13	I try to reduce my consumption of scarce natural resources.
	SB14	I take a long shower.
	SB15	I keep the fridge open for a long time, looking at what's inside.
	SB16	When I'm at home, I leave the lights on in rooms that are not used.
Innovative Behavior	IB1	I think of solutions for situations that seem hopeless.
	IB2	I prefer to create rather than improve.
	IB3	I have new perspectives for old problems.
	IB4	I can maintain a position of disagreement against the group.
	IB5	I am a stimulating person.
	IB6	I have original ideas.
	IB7	I share my ideas.
	IB8	I like to vary already established routines.
	IB9	I prefer gradual rather than radical change.
	IB10	I can deal with several new ideas at the same time.
	IB11	I prefer to work with one problem at a time than with several problems at the same time.
	IB12	I often venture by doing things differently.
	IB13	I need the encouragement of frequent change.

Note. Source: Prepared by the authors.

In addition to these constructs, the following sociodemographic aspects of the university students were recorded: Gender (GE); Age (AGE); Civil Status (CS); and School Level (SL). Family Entrepreneurs (FE) were also considered, through the experience of their parents, to verify whether university students have entrepreneurial parents; or if they have parents who were once entrepreneurs but are no longer; or if they have parents who have never been entrepreneurs.

Exploratory factor analysis (AFE) was first used to reduce the number of variables and group them into constructs, with Varimax orthogonal rotation type, most often used to reduce the number of variables. In addition, the substitute variable criterion was adopted for each construct, by which the variable with the highest factor loading is considered to have the greatest explanatory power (Hair et al., 2009). Logistic regression and construction of classification and regression trees (CART) allowed analyzing the influence of family entrepreneurs and sustainable and innovative behavioral constructs on entrepreneurial intent. SPSS version 22.0 was used for the analysis and treatment of the data.

4 ANALYSIS AND DISCUSSION OF THE RESULTS

4.1 Sample profile

The sample consisted of 285 university students, in which people with Entrepreneurial Intent (EI) predominated, corresponding to 53.3%, while 40% did not have EI and 6.7% were already entrepreneurs. Although the majority of the sample was composed of women (53.7%), men in general demonstrated more EI than women (51.5% versus 48.5%). Individuals with EI were mostly between 19 and 23 years old, with an average age of 23 years. Based on the perspective of Liñán and Chen (2009), investigating a sample referring to the EI of university students is convenient for research that aims to understand the phenomenon of entrepreneurship.

Among individuals who had never worked, 58.2% had EI and 41.8% did not. Comparing EI between individuals working in the public and private sectors, those who worked in the private sector reported having more EI (55.5%) than those in the public sector (48.3%). For individuals who had never worked, 58.2% had EI, a result that differs from that of Kuckertz and Wagner (2010), who found that individuals with professional experience had more EI than those without professional experience (Table 3).

Table 3. Cross tabulation between professional experience and entrepreneurial intention

Professional experience	Entrepreneurial intention			Total	P-value of chi-square
	Yes	No	Entrepreneur		
Never worked	39 (58.2%)	28 (41.8%)	0 (0,0%)	67 (100.0%)	
Business owner / partner	8 (34.8%)	1 (4.3%)	14 (60.9%)	23 (100.0%)	
Works in the private sector	66 (55.5%)	50 (42.0%)	3 (2.5%)	119 (100.0%)	0.000

Works in the public sector	28 (48.3%)	29 (50.0%)	1 (1.7%)	58 (100.0%)
Another professional situation	11 (61.1%)	6 (33.3%)	1 (5.6%)	18 (100.0%)
Total	152 (53.3%)	114 (40.0%)	19 (6.7%)	285 (100.0%)

Source: Research data.

Regarding the experience of parents (family entrepreneurs) and the EI of university students, there was a clear influence of entrepreneurial parents on the EI of the students, where 152 had entrepreneurial parents, and of these, 70 were EI (68.0%) and 23 not (22.3%) and 10 were already entrepreneurs (9.7%). In turn, among the 114 students who did not have entrepreneurial parents, 45 had EI (41.7%), 57 did not not (52.8%) and 6 were entrepreneurs (5.6%) (Table 4).

Table 4. Cross tabulation between family entrepreneurs and entrepreneurial intention

Parents' experience	Entrepreneurial intention			Total	P-value of chi-square
	Yes	No	Entrepreneur		
Yes, at least one is an entrepreneur	70 (68.0%)	23 (22.3%)	10 (9.7%)	103 (100.0%)	0.000
No. but at least one was once an entrepreneur	37 (50.0%)	34 (45.9%)	3 (4.1%)	74 (100.0%)	
No. none has ever been an entrepreneur	45 (41.7%)	57 (52.8%)	6 (5.6%)	108 (100.0%)	
Total	152 (53.3%)	114 (40.0%)	19 (6.7%)	285 (100.0%)	

Source: Research data.

The results of both analyses showed a statistically significant association between professional experience and EI, and between family entrepreneurs and EI, since the p-value of the chi-square was 0.000, which is strongly acceptable since there is a minimum level of 0.05 for significance. According to Maroco (2007), the chi-square test allows testing whether two or more independent samples (or groups) differ in relation to a given characteristic.

Depending on this association between family entrepreneurs and EI, there is evidence to infer that the existence of an influence of family entrepreneurs on EI, pointing to acceptance of **H₁**: The existence of family entrepreneurs influences the entrepreneurial intention of university students. This corroborates the findings of Ching and Kitahara (2015), Ferreira et al. (2017) and Souza, Silveira and Nascimento (2018), also carried out with Brazilian university students.

4.2 Factor analysis for sustainable and innovative behavioral constructs

First, factor analysis for sustainable behavior was carried out considering the theoretical-methodological perspective of Gonçalves-Dias et al. (2009). This factor analysis showed 66.415% of explained variance, with Kaiser-Meyer-Olkin value (KMO = 0.740) and Bartlett's sphericity test (chi-square = 866.843), indicating that the analysis was significant and explained by the variables under analysis (Table 5).

Table 5. Factor analysis for sustainable behavior

Variables	Factorial loads					Communalities
	Engaged consumption	Concern about garbage	Domestic environment	Boycott via consumption	Mobilization	
SB1	0.771					0.641
SB2	0.736					0.648
SB4	0.789					0.701
SB5	0.703					0.567
SB6		0.850				0.741
SB7		0.903				0.829
SB8		0.780				0.638
SB15			0.780			0.671
SB16			0.789			0.661
SB9				0.772		0.624
SB14				0.739		0.628
SB12					0.824	0.717
SB13					0.640	0.567

Source: Research data.

With the substitute variable criterion for each construct of sustainable behavior, there were five constructs with their respective most representative variables: Engaged consumption - SB4: "Concerns about the environment influence my purchasing decisions" (factor loading of 0.789); Concern about garbage - SB7: "I avoid throwing paper on the ground" (factor loading of 0.903); Domestic environment - SB16: "When I'm at home, I leave the lights on in rooms that are not used" (factor loading of 0.789); Boycott via consumption - SB9: "I buy products from a company even though it pollutes the environment" (factor loading of 0.772) and Mobilization - SB12: "I mobilize people for the conservation of public spaces" (factor loading of 0.824).

For the other analysis, considering innovative behavior, 67.429% of explained variance was indicated, with Kaiser-Meyer-Olkin value (KMO = 0.601) and Bartlett's sphericity test (chi-square = 196.423) indicating that this analysis was also significant (Table 6).

Table 6. Factor analysis for innovative behavior

Variables	Factor loading			Communalities
	Adequacy to originality	Efficiency in the details	Preference for dynamism and creativity	
IB1	0.797			0.658
IB3	0.802			0.655
IB9		0.820		0.707
IB11		0.807		0.695
IB5			0.707	0.631
IB7			0.856	0.765
IB8				0.618
IB13				0.841

Source: Research data.

Therefore, the variables with the highest factor loadings in each construct were adopted, taking into account Foxall and Hackett (1992): Adequacy to originality - IB3: "I have new perspectives for old problems" (factor loading of 0.802); Efficiency in the details - IB9: "I prefer a gradual change to a radical one" (factor loading of 0.820); Preference for dynamism and creativity - IB7: "I share my ideas" (factor loading of 0.856); and Preference for change - IB13: "I need stimulus for frequent change" (factor loading of 0.841).

4.3 Analysis of logistic regression and CART

In view of the factorial structures of the exploratory factor analysis, nine behavioral constructs were considered, through their substitute variables - which constitute each construct. Logistic regression was adopted to analyze the influence of family entrepreneurs, sustainable and innovative behavioral constructs, as well as variables related to the sample profile (independent variables) in the EI (dependent variable) (Table 7).

Table 7. Analysis of the logistic regression of the model variables

Variables	B	Sig.	Exp(B)
Engaged consumption	-0.099	0.556	0.906
Concern about garbage	-0.598	0.102	0.550
Home environment	-0.227	0.140	0.797
Boycott via consumption	0.096	0.581	1.101
Mobilization	0.260	0.029	1.296
Adequacy to originality	0.657	0.001	1.928
Efficiency in the details	-0.083	0.563	0.920
Preference for dynamism and creativity	-0.097	0.579	0.908
Preference for change	0.434	0.007	1.543
Gender (Male)	0.688	0.025	1.989
Age	-0.039	0.288	0.962
Marital status	-0.217	0.646	0.805
School level	-0.080	0.177	0.923
Professional experience (Never worked)	-0.620	0.341	0.538
Professional experience (Works in the private sector)	-0.369	0.551	0.692
Professional experience (Works in the public sector)	-0.513	0.447	0.599
Parent Experience (At least one is an entrepreneur)	1.483	0.000	4.406
Parents' Experience (At least one was an entrepreneur)	0.482	0.178	1.619
Constant	-2.142	0.969	0.117

Source: Research data.

The regression model had efficiency of 81.9% to explain EI, with Nagelkerke's R^2 of 0.324 and likelihood ratio of $p = 0.000$, confirming the viability of the applied model. In relation to sustainable behavior, the influence of mobilization on EI (p-value of 0.029, B of 0.260) was found, which allows inferring that people who are more concerned with mobilizing other people regarding the importance of conserving public spaces and the environment, in turn, are more prone to have EI compared to people without this concern, an indication that confirms **H₂**: Sustainable behavior exerts an influence on the entrepreneurial intention of university students, coinciding with the findings of Tilley and Young (2009), Kuckertz and Wagner (2010) and Boszczowski and Teixeira (2012).

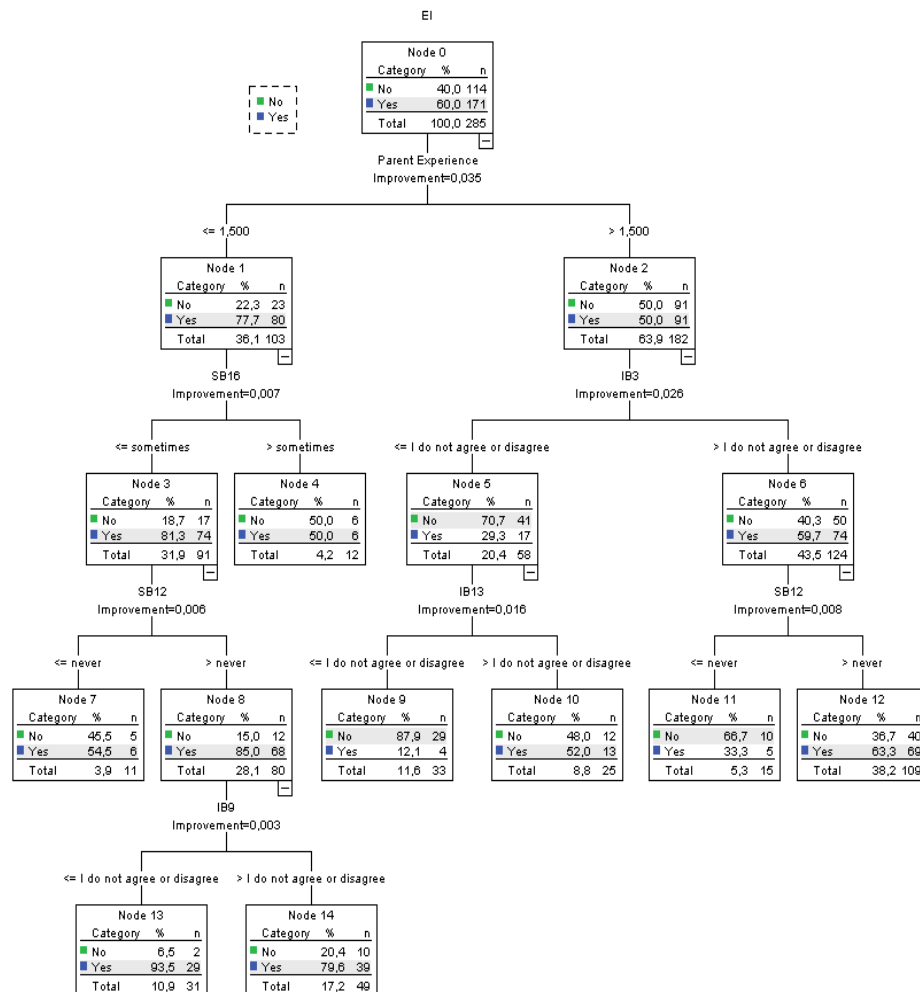
About innovative behavior, there were influences of the variable's adequacy to originality (p-value of 0.001, B of 0.657) and preference for change (p-value of 0.007, B of 0.434) in EI. Thus, the most original university students, with new perspectives on problems, had a 92.8% chance of having EI (Exp (B) = 1.928); and those who preferred constant changes had a 54.3% chance of having EI (Exp (B) = 1.543), urging acceptance of **H₃**: Innovative behavior exerts an influence on the entrepreneurial intention of university students, corroborating Marcati et al. (2008), Ahmed et al. (2010), Wurthmann (2014), Soomro and Shah (2015) and Kollmann et al. (2017).

The influence of family entrepreneurs on the university students' EI was evident, with the variable experience of parents (at least one is an entrepreneur), p-value of <0.001 , B of

1.483 and $\text{Exp (B)} = 4.406$, emphasizing that individuals with entrepreneurial parents in the sample were four times more likely to have EI than those who did not have entrepreneurial parents, also supporting **H₁**: The existence of family entrepreneurs influences the entrepreneurial intention of university students, in line with Randerson et al. (2015), Wang et al. (2018), Sieger and Minola, 2017 and Zampetakis et al. (2017). In addition, men were 98.8% more likely to have EI than women ($\text{Exp (B)} = 1.989$), p-value of 0.025 and B of 0.688, showing, then, that the female respondents were less prone to be entrepreneurial.

Another method adopted was the CART, which is based on the execution of successive binary partitions of a sample, therefore based on the sampled results of the covariates, aiming to constitute homogeneous internal subsamples (Taconeli, Zocchi, & Dias, 2008). The nodes are subsets of the application of the data division rules in relation to the dependent variable. The root of the classification tree is the first node, corresponding to the dataset; and the leaves are considered the terminal nodes, as shown in Figure 1.

Figure 1 - Classification and regression trees - CART



Source: Research data.

In view of the first group formed by CART, there was an influence of the sustainable behavioral constructs - mobilization and domestic environment; innovative - efficiency in details; and family entrepreneurs (normalized importance of 100%) in the EI of university students. The results here indicated that university students with EI were more efficient in details, with habits of mobilizing others regarding environmental importance, with the custom of worrying about the domestic environment, who try not to leave the lights on when they are not at home; and have entrepreneurial parents.

Another group formed, also considering university students with EI, was denoted by the variable's mobilization of people regarding the public space, adequacy to originality, and parents who were once entrepreneurs, but no more. Therefore, the university students with EI were concentrated in the innovative cognitive style, capable of proposing creative, original and innovative solutions, coinciding with the theory of adaptation-innovation proposed by Kirton (1979). This corroborates the findings of Marcati et al. (2008), Wurthmann (2014) and Soomro and Shah (2015). However, the group of university students who did not prefer changes, did not consider themselves original, and did not have entrepreneurial parents; did not have EI.

When considering these analyses, it is pertinent to note the influence of the family context in the formation of individuals with EI, which is in line with Ajzen's theory of planned behavior (1991), referring to the influence of the social context (family members) on the formation of EI. This corroborates the empirical results of the studies of Carvalho and González (2006), Teixeira and Davey (2010), Steinmetz et al. (2016) and Sieger and Minola (2017). In general, the influences of sustainable behavioral constructs (Kuckertz & Wagner, 2010); innovators (Marcati et al., 2008); and family entrepreneurs (Paiva et al., 2019; Wang et al., 2018) were found in entrepreneurial intent (Liñán & Chen, 2009). According to the results of the logistic regression and the CART, sufficient evidence was found to accept the three hypotheses, as shown in Table 8, a summary of the values observed and expected hypotheses.

Table 8. Summary of hypotheses

Hypotheses	Construct	Expected value of the hypothesis	Observed value of the hypothesis
H₁	Family Entrepreneurs	Positive influence on EI	Positive influence
H₂	Sustainable Behavior	Positive influence on EI	Positive influence
H₃	Innovative Behavior	Positive influence on EI	Positive influence

Source: Prepared by the authors.

This study is pertinent because it provides an overview of the influence of family entrepreneurs and sustainable and innovative behavioral constructs on the EI of Brazilian

university students, expanding the empirical literature regarding the alignment of entrepreneurship, innovation and sustainability.

5 CONCLUSIONS

This study analyzed the influence of family entrepreneurs and sustainable and innovative behavioral constructs on the entrepreneurial intention of university students. The applied method was suitable to meet the proposed objective, focusing mainly on the logistic regression model and the CART method. The results showed there was an influence of the family context on the entrepreneurial intention of the university students - that is, with at least one entrepreneurial parent were more likely to have EI than those who did not have any entrepreneurial parent. This result jibes with the perspective of the theory of planned behavior of by Ajzen (1991), used as the dominant theoretical model to understand and explain entrepreneurship, as emphasized by Liñán and Chen (2009), Schlaegel and Koenig (2014), Kautonen et al. (2015) and Zampetakis et al. (2017).

We also found that sustainable behavior had an influence on the university students' EI, mainly due to the mobilization construct, indicating that the more the individual mobilizes others about environmental importance and conservation, the greater the possibility of having EI; and those who had obvious concerns about the home environment, such as energy consumption, were also more likely to have EI. This analysis demonstrated the relevance of environmental concerns in entrepreneurship, such that entrepreneur, since they impact the economy, society and the environment, should be aware of the importance of their actions and attitudes towards environmental issues.

When considering the theory of adaptation-innovation developed by Kirton (1976), used to predict potential entrepreneurs, we found that the university students in the sample with EI presented behaviors more focused on innovation. This suggests that entrepreneurs tend to be innovative and capable of proposing creative and original solutions for the market. Wurthmann (2014) and Soomro and Shah (2015), when carrying out empirical research on the identification of potential entrepreneurs and innovation in the intention to start new businesses, found that Ajzen's (1991) theory of planned behavior and Kirton's adaptation-innovation theory (1976) are pertinent to identify potential entrepreneurs. This was evidenced in this study, which analyzed, in addition to sustainability, the influence of the family context and innovation on EI.

Considering the current difficulties, such as economic, social and environmental crises, entrepreneurship is an alternative for people to contribute to society. Since EI has growing

relevance, the main contribution of this study is to encourage policies and practices aimed at higher education institutions to prompt them to incorporate environmental, innovative and social studies and practices aligned with entrepreneurship in order to enhance social benefits and environmental impacts generated by the entrepreneurs, who provide jobs and income for society. Although the literature on entrepreneurial intention is broad, both in national and international databases, we did not find any studies regarding the alignment of innovation and sustainability in the entrepreneurial intention of university students. Hence, this study can be classified as groundbreaking.

This study has some limitations, such as the sample composed of students with a single major (business administration) at one university in a single country, without considering longitudinal aspects. Therefore, we recommend for future research to align sustainability and innovation in EI between different degree programs, with other universities, and carry out comparisons with countries, to further expand sustainability and innovation in the context of entrepreneurship.

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