Gender, entrepreneurial behaviour and firm performance of Brazilian students: integrating economic and behavioral perspectives

Serje Schmidt*, Maria Cristina Bohnenberger, Cristine Hermann Nodari, Mayla Drielle Joiner Santos Da Silva

Feevale University, ERS-239, 2755. 93525-075 – Novo Hamburgo, RS, Brazil

ARTICLE INFO

Keywords:
Entrepreneurship
Entrepreneurial behaviour
Gender
Performance
Higher education

ABSTRACT

Gender differences in entrepreneurship behaviour have been extensively studied. This study adopts an intersection between the behavioural and the economic approaches to understand gender differences among students. It has the objective to identify the gender differences in both the entrepreneurial behaviour and entrepreneurial performance of Brazilian higher education students. A quantitative survey was conducted among 1,550 students from two universities. Data was analysed using multi-group structural equations modelling. Results identified gender differences both among entrepreneurial characteristics and in their relationship with performance. This study contributes theoretically and empirically to a better understanding on gender differences within the context of higher education students.

1. Introduction

Historically, women and men have played different roles in society. While men had their social trajectory focused on external jobs, such as politics, war, and science, women held occupations within the scope of family management. In the context of entrepreneurship, women held strong ties in their relationships with the purpose of family planning. Men, in turn, preserved skills in the commercial area, managing to keep in touch with several people for a shorter time. Women, therefore, were usually considered as providing only supplementary family income. In this perspective, it would not be necessary for women to have a salary similar to that of men, since they did not have the function of supporting a large part of family economic issues. Today, women are still seen less frequently in the labour market than men, commonly receiving inferior treatment, exposed to sexist and discriminatory stereotypes (Carreira et al., 2001; Vale et al., 2011).

In Brazil, the first feminist movements emerged in mid-1964, when women's struggle for the demand of better social, civil, and economic rights stood out. It was only after the military dictatorship (second quarter of 1985), however, that there was a prospect of more gender equality, with the growth and diversification of female employability. This scenario resulted from a reduction in the purchase and salary of families at the time, in addition to behavioural changes arising from the feminist movement, making women crave an independent life and professional ful\text{\textperiodcentered}llment (Pinsky and Pedro, 2012).

Observing Brazil's economic growth in the last decades, entrepreneurship has been perceived as an important ally in the struggle against unemployment, constituting itself a solid socioeconomic driver (Almeida et al., 2013). Recent cultural changes have also led more women to the labour market, including to entrepreneurial activity. Initial entrepreneurship between men and women tends to be very similar, as both usually have experience in the area they want to work for, seek good schooling and generally want to continue family businesses (Hisrich et al., 2014; Vale et al., 2011). In fact, GEM (2018) statistics indicate that the initial entrepreneurship rate for men is similar to that for women, with a difference of only 1.2 percentage points. The rate for established entrepreneurship shows a more significant difference (6.1 percentage points), suggesting greater longevity of companies started by men. These data suggest that certain dimensions of entrepreneurial behaviour of women are different from those of men in Brazil.

In Brazil, a recent literature review conducted by Gimenez et al. (2017) found that the first publications about women entrepreneurship appeared in the Balas Proceedings 1998, and later a research thesis in the Federal University of Santa Catarina in 2002. It is, therefore, a relatively recent research topic in this country. They also suggest that the research on gender and entrepreneurship in Brazil is mostly qualitative. Among

* Corresponding author.
E-mail address: serje@feevale.br (S. Schmidt).

https://doi.org/10.1016/j.heliyon.2022.e08750
Received 14 September 2021; Received in revised form 22 November 2021; Accepted 10 January 2022
2405-8440/© 2022 Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).
the few quantitative studies, sophisticated statistical techniques are not common, unlike what is observed in other countries.

Naturally, in addition to the gender issue, the entrepreneurial behaviour is subject to significant influence by genetics, family, professional experience, and economic environment. Education, as much as the social context, can influence people’s entrepreneurial behaviour. In the university environment, entrepreneurship has received attention. It might be mainly because – without ignoring other antecedents – it is a phase of entrepreneurial preparation that is closer to the actual exercise of this activity (Nordqvist and Melin, 2010; Nowinski et al., 2019; Stolze et al., 2018).

Entrepreneurship can be understood basically under two theoretical lines: the economic and the behavioural. The economic perspective involves understanding the importance and the impact on the economic development that entrepreneurship brings to society. The behaviouralist focuses on human behaviour and its essences (Baggio and Baggio, 2015). The supply of entrepreneurs is multiple and wide, and there are several dimensions of entrepreneurial behaviour to consider (Birley and Muzyka, 2001; Dornelas, 2018). However, there is no unanimity regarding the literature related to entrepreneurial behaviour and gender, as detailed later in this study. Likewise, the understanding of economic development from an entrepreneurial gender perspective is also limited (Sirec and Mocnik, 2014). Among the few studies involving gender, entrepreneurial orientation and performance, Fellnhofer et al. (2016) suggest that, in Austria, women have lower entrepreneurial orientation but similar work performance than men. On the other hand, in Bosnia and Herzegovina, Palalic et al. (2017) found higher entrepreneurial orientation (except proactiveness) in women and also higher performance in their businesses.

The ambiguity of results regarding gender and entrepreneurship, the scarcity of studies relating the behavioural and economic dimensions under a gender perspective, the recentness of entrepreneurial gender research in Brazil, the importance of education for the entrepreneurial behaviour, and the paucity of quantitative approaches in this empirical environment enhance the importance of this study. Although not meant to be exhaustive in both behavioural and economic approaches, this article addresses an intersection of these perspectives, seeking to understand the gender differences on entrepreneurial behaviour and its relationship with performance within the education environment. Therefore, this article aims to identify gender differences in both the entrepreneurial behaviour and entrepreneurial performance of Brazilian higher education students.

A quantitative research was conducted with 1,550 undergraduate students of two universities in southern Brazil. An analysis using structural equations modelling was carried out to reach the results, inspiring reflexions, fostering the debate, and implying actions regarding entrepreneurial education in a social context. This research may also support government agencies and public policy makers who, in association with higher education institutions, can direct efforts in project development, training and support to promote entrepreneurship while also considering gender differences.

This article is structured as follows: after this introductory perspective, the literature that supports this study is presented, both in terms of entrepreneurial behaviour (Section 2) and gender (Section 3). The method is detailed on Section 4, followed by the study results (Section 5) and its discussion (Section 6). A conclusion and closing remarks are presented on Section 7.

2. Dimensions of the entrepreneurial behaviour

The study of entrepreneurship derives from the seminal Theory of Economic Development (Schumpeter, 1934). A recent definition of the entrepreneur is proposed by Zhao et al. (2010, p. 383): the “founder, owner, and manager of a small business”. Since Schumpeter, the scope of discussions about the entrepreneurial behaviour increased significantly. The subject has evolved into different approaches and its complexity increased. In the literature, it is possible to find several authors addressing the dimensions of the entrepreneurial behaviour. Dornelas (2018), for example, classified entrepreneurial behaviour in three areas: technical skills, personal and managerial characteristics. Technical skills can be described as those involving the skills of writing, speaking, listening, and processing information. Personal characteristics include several personality factors such as being innovative, persistent, prone to change, willing to take risks and visionary. Management characteristics are those that involve areas of creation such as marketing, management, and company development such as administration, finance, and operations.

In a recent literature review, Schmidt et al. (2018) identified eight entrepreneurial behaviour dimensions. Table 1 presents each of the behaviour dimensions and their proposed definitions.

The authors validated these dimensions in universities in the international context, resulting in seven dimensions. These dimensions were used here, exploring them from a gender approach.

3. Entrepreneurship and gender

In general, women perceive themselves as less capable of becoming entrepreneurs than men, possibly because they understand that they need a much higher educational level than men to pursue a similar career (Thébaud, 2010). It is possible to find distinctions between men and women regarding the dimensions of entrepreneurial behaviour proposed by the Schmidt et al. (2018).

Regarding creativity, Hisrich et al. (2014) suggest that women are more creative and realistic, while men are more innovative and idealistic. Vale et al. (2011) also understand that women are relatively less concerned with innovation, being observed in more traditional entrepreneurial activities.

As for leadership, some authors take ambiguous positions. Hisrich et al. (2014) state that both women and men are enthusiastic and energetic, but men are more satisfied when they are in charge of the organization. Frankel (2007) believes that women have a better ability to inspire and motivate people, although Hisrich et al. (2014) suggest that men are more persuasive. In a study involving students in the United States, India and Turkey (Gupta et al., 2009), the entrepreneurial stereotype was perceived as predominantly male, including leadership. Lechner et al. (2018) identified that work values play a central role in entrepreneurial intentions and leadership. This research indicated that women place a lower value on uncertainty, independence and risk and a higher value on security. In many cases, when in leadership positions, women assume a dual role to meet the male standards that dominate leadership and entrepreneurship (Patterner et al., 2012). Despite this, the ‘business case’ narrative, in which organizations with women at the top

### Table 1. Entrepreneurial behaviour dimensions.

| Dimension       | Definition                                                                 |
|-----------------|---------------------------------------------------------------------------|
| Self-efficacy   | The belief on his or her own capacity to control the internal and external necessary resources for the success of his or her project. |
| Opportunity     | An alertness to market opportunities that may arise for new products and services. |
| Sociable        | The easiness to effectively interact with other people.                    |
| Creative        | One who relates ideas, facts, necessities, demands and resources, producing new concepts for products, services, and processes. |
| Planner         | The person that gets prepared for the future, trying to foresee the necessary steps to reach his or her goals. |
| Risk taker      | The willingness to commit significant resources to a project in the face of uncertainty. |
| Leader          | The ability to inspire or influence the behaviour of others.               |

Note: The Persistent dimension was not included here from their original table because it was not validated in the empirical environment.

Source: based on Schmidt et al. (2018).
of their hierarchy are more likely to succeed, has been increasingly emphasized (Engly and Heilman, 2016).

Considering the Planner behaviour, the ambiguity remains. Hisrich et al. (2014) suggest that women and men are both goal-oriented. Frankel (2007) states that women have a clearer view of the goals, while Carreia et al. (2001) state that men have greater objectivity, action, and problem-solving. From the male perspective, the emphasis is on the search for business objectives related to status and wealth, which focuses mainly on economic aspects of business growth, such as increased sales, and profitability (Santos et al., 2016; Thébaud, 2016). From the female entrepreneurship perspective, there is also research on business profitability. Still, they also include other aspects of work relationships, such as commitment to employment, quality of service and business operations (Dean et al., 2019; Thébaud, 2015).

Self-efficacy has been more often related to a male behaviour (Díaz and Moreno, 2015; Ladd et al., 2019). Hisrich et al. (2014) attribute a medium level of self-confidence to women and high to men. Camelo-Ordaz et al. (2016) identified that women’s perception of their self-efficacy can restrict their attitudes towards entrepreneurship. Vale et al. (2011) understand that women depend more on other people, usually internal to the company, than men for decision making. Men are also perceived in the literature as having greater determination (Carreia et al., 2001), achievement (Hisrich et al., 2014), perceived controllability (Vamvaka et al., 2020) and entrepreneurial self-efficacy (Nowinski et al., 2019). In opposition to these findings, Mueller and Dato-On (2008, 2013) did not identify gender differences in the dimension of self-efficacy. Chowdhury et al. (2019) identified significantly smaller differences in higher degrees of education. However, there is no unanimity regarding the impact of education on the development of this dimension (Valencia-Arias and Marulanda-Valencia, 2019).

Although Frankel (2007) states that women are more willing to take risks, Carreia et al. (2001) understand that they have difficulty in reconciling their personal and professional lives, and are also responsible for family care. Such facts make the decision to open their own business riskier. In this same reasoning, the differences in investment of resources, adhesion to financing and business risk also reveal differences between genders for risk. In the research conducted by Guzman and Kacperczyk (2019), gender disparities are identified in the trajectory of business development and maintenance, conditioned from the moment of foundation to investors’ prejudices and stereotypes about female entrepreneurship. However, contrary trends in financing and access to credit for female businesses are observed in the literature associated with the characteristics of meeting deadlines and establishing more rigid targets imposed by the market for this gender (Moreira et al., 2019; Rosca et al., 2020).

Social skills for entrepreneurial activity are similar in terms of gender. Men and women are perceived as able to deal with this environment in a flexible, tolerant, sensitive, and intuitive way. The differences occur in relation to the support groups sought. In the case of men, the search for friends, well-known professionals and potential partners is more frequent. In the case of women, the search for close friends, family, professional female groups and trade associations occur more intensely (Hisrich et al., 2014; Vale et al., 2011).

Some studies indicate that social skills tend to influence the difference between genders in the trajectory of the enterprise. At the origin of the enterprise, women tend to socially mobilize interest groups for the main job, to the detriment of more pragmatic aspects that involve, for example, financial planning. With business improvement, women seek to develop social skills based on formal education and knowledge acquisition (García-Palma and Molina, 2016; Rosca et al., 2020).

Apparent differences between genders may be observed in relation to entrepreneurial motivation and opportunity detection. As the entrepreneurial activity is more strongly perceived as masculine, the intention to follow it is more intense among men (Nowinski et al., 2019) or among the people who identify most with that gender (Gupta et al., 2009). Although job dissatisfaction is a motivation for both genders (Hisrich et al., 2014), it is possible to perceive other aspects that influence entrepreneurial motivation. Men, for example, seek to be their own bosses, through an opportunity to acquire another business or due to overwork in their actual job. Women start their own business after identifying an opportunity in the market or planning to change their current situation. Lewis et al. (2016), for example, concluded that women identify opportunities to initiate entrepreneurial activities in the transitional process of motherhood. Camelo-Ordaz et al. (2016) identified that the low ability to recognize opportunities for women negatively affects their entrepreneurial intention.

Studies of entrepreneurial behaviour from a gender perspective indicate some characteristics that are specific to men and others to women. Men tend to be more innovative (Hisrich et al., 2014); manifest willingness to have control and command (Hisrich et al., 2014); are more objective (Carreia et al., 2001); tend to be focused on the economic aspects and profitability of the enterprise (Santos et al., 2016; Thébaud, 2016); perceive themselves with greater self-efficacy (Díaz-García and Jiménez-Moreno, 2010; Ladd et al., 2019); seek support, when necessary, from friends or renowned professionals (Hisrich et al., 2014; Vale et al., 2011) and have strong entrepreneurial motivation (Nowinski et al., 2019).

On the other hand, women are characterized by seeking more traditional businesses (Vale et al., 2011); have a clear vision of the goals they intend to achieve (Frankel, 2007); are concerned with social aspects and labour relations in the growth of the business (Dean et al., 2019; Thébaud, 2015); have difficulty reconciling family and professional life (Carreia et al., 2001); build a support network composed of the family and female entrepreneurship support groups (Hisrich et al., 2014; Vale et al., 2011); have a low ability to recognize opportunities (Camelo-Ordaz et al., 2016); are driven towards entrepreneurship even during motherhood, motivated by a need to manage time or identify an opportunity (Lewis et al., 2016).

There is no unanimity in the literature regarding the influence of gender on leadership and planning characteristics in entrepreneurial behaviour. Both men and women lead and plan their endeavours. Regarding leadership, it is observed that women have a better ability to inspire and motivate people, while men are more persuasive (Hisrich et al., 2014). In planning, it is clear that women have a broader view, contemplating social and relationship aspects (Dean et al., 2019; Thébaud, 2015) in addition to the profitability aspects that, in general, are men’s focus (Santos et al., 2016; Thébaud, 2016).

4. Method

A quantitative survey was used to achieve the objective of this research. The data were collected using a questionnaire applied at random and probabilistically among students of various courses offered by both universities, resulting in 1,550 student respondents. According to the Article 1 of Resolution n. 510 of April 7th, 2016, edited by the Brazilian National Health Council, the Research Ethics Council or the National Health Council systems will not register or evaluate public opinion polls with unidentified participants, research based on aggregated databases without the possibility to identify its participants, or research that aims to deepen theoretically situations that emerge spontaneously and contingently in professional practice when revealing no data that can identify its participants. This research was, therefore, not submitted to the Research Ethics Committee. The measurement items are represented in Table 2.

Table 2

| Items of entrepreneurial behaviour dimensions were measured by a seven-point Likert scale, ranging from 1 = ‘completely agree’ to 7 = ‘completely disagree’. Performance was measured by a single item stated |
|---|

1. “Resolução nº510 do Conselho Nacional de Saúde do Brasil” (our translation), available in [https://www.in.gov.br/materia/-/asset_publisher/Kujrw0TZc2NB/content/id/22917581](https://www.in.gov.br/materia/-/asset_publisher/Kujrw0TZc2NB/content/id/22917581).
As mentioned in the introduction, the literature is incipient and does not provide support for the association between entrepreneurial behaviour and performance. For this reason, an exploratory approach was adopted in this study, testing all possible associations between behaviour and performance. The analysis followed these steps: 1) exploratory factor analysis (EFA) to verify whether the original measurement instrument resulted in a similar theoretical structure; 2) confirmatory factor analysis (CFA) to calculate convergent and discriminant validity of the measurement model; 3) estimation of the structural equation model (SEM) to identify the relations between constructs; 4) multigroup SEM analysis with independent samples to compare the entrepreneurial behaviour dimensions with performance between genders (Anderson and Gerbing, 1988; Byrne, 2016; Hair et al., 2014). Step 1 was executed using IBM SPSS Statistics version 26 and steps 2 to 4 using IBM SPSS Amos version 22.

5. Results

The sample profile was characterized by a relatively homogeneous distribution of students concerning the percentage of the course completed, with 26.6% of students in the 1st quartile (with up to 25% of the course completed), 24.4% of students in the 2nd quartile, 18.2% in the 3rd quartile and 30.8% in the 4th quartile. As expected, most respondents (77.4%) are 30 years of age or less. Regarding gender, 59.3% of respondents consider themselves to be female and 40.7% male.

5.1. Exploratory factor analysis

Exploratory factor analysis (EFA) was performed using extraction by principal components and varimax rotation. The questions about the entrepreneurial behaviour were first tested for their communalities. Each item with communalities less than 0.5 was individually removed from the study due to their lower contribution to the data's subjacent structure (Hair et al., 2014). Each removal was followed by a new analysis until no item had communalities below 0.5 was left. The excluded items were: 16, 43, 23, 11, 15, 47 and 31. The resulting EFA returned KMO sample adequacy test of 0.948 and Bartlett sphericity test of 21114,921, with 528 degrees of freedom and significance of p < 0.001, indicating adequate adherence between the study sample and the EFA structure. The rotated matrix is presented in Table 3.

Only the three items with the most significant factor estimates for each construct were further considered to simplify the measurement model. The data structure in the rotated matrix resulted in seven components, but as the seventh one was composed of only two items, it was discarded (Hair et al., 2014). All items converged to their original construct, except item 40, originally associated to the Planner construct. However, the idea of having clear objectives may also be related to Self-efficacy. The final six components were: 1) detection of opportunities, 2) self-efficacy, 3) leadership, 4) planner, 5) sociable and 6) risk-taker.

5.2. Confirmatory factor analysis

EFA's component structure was translated into a confirmatory factor analysis (CFA) represented in Figure 1 that was performed using SPSS AMOS software.

The measurement model presented adequate model fit ($\chi^2$/df = 6,134; CFI = 0.939; RMSEA = 0.058), convergent validity (average variance extracted (AVE) for all constructs ≥0.672; construct reliability (CR) for all constructs ≥0.712) and discriminant validity (AVE for any two constructs greater than the squared correlation estimate between these two constructs) (Hair et al., 2014).

5.3. Male and female entrepreneurial behaviour

Measurement model in Figure 1 was tested with the same sample divided into two groups: male and female subjects. First, it was tested for measurement invariance across groups. Then, the factor mean structure for each group was compared. AMOS's multigroup analysis was performed and provided evidence that factor loadings are operating similarly across male and female groups. Chi-square statistics for each degree of freedom of the constrained model returned 3.717, with CFI of 0.935 and RMSEA of 0.041. The difference of CFI from the unconstrained model was less than the recommended cut-off of 0.01 ($\Delta$CFI = 0.000). Convergent validity (construct AVE ≥0.655 male and ≥0.674 female and CR ≥ 0.693 male and ≥0.658 female) and discriminant validity for both groups were attested and found adequate.
Test for mean differences implied that one of the group's mean parameters is fixed to zero, while leaving the other group free to be estimated (Byrne, 2016). The resulting mean for the free parameter indicated the difference between the groups. The factor mean of the male group was arbitrarily chosen to be freely estimated, substituting its indicated the difference between the groups. The factor mean of the male mated (Byrne, 2016). The resulting mean for the free parameter indicated good parameters is fixed to zero, while leaving the other group free to be estimated. Model fit again indicated good fit ($\chi^2$/df = 3.599; CFI = 0.932; RMSEA = 0.041), and mean differences are showed on Table 4.

This procedure presented significant ($p < 0.01$) mean differences between male and female groups for three factors: opportunity detection, leadership and risk taking. As the Likert scale attributed lower numbers to greater levels of agreement with the statements, these results indicate that male subjects accredited themselves a significantly better capacity to detect opportunities, to assume the role of leaders within organizations and to take risks, than female subjects did.

5.4. Entrepreneurial behaviour, gender, and performance

The effects of entrepreneurial behaviour on performance were tested using a structural model. First, the structural model represented on Figure 2 was tested considering the whole sample (both groups together). The structural model resulted in an adequate fit ($\chi^2$/df = 5.505; CFI = 0.934; RMSEA = 0.040). Table 5 presents the standardized regression weights and significance tests for both groups. A male and female comparison was also performed regarding the effects of the entrepreneurial behaviour on performance. To interpret these estimates, one must consider that the scale for Performance was 1 = 'much better'; 2 = 'better', 3 = 'similar'; 4 = 'worse' and 5 = 'much worse'. Therefore, positive estimates indicate that the larger the dimension of the behaviour, the greater the performance.

When the multigroup analysis was completed, results indicated that the relation between Social behaviour and Performance presented a
significant relation \( (p = 0.032) \) for the Female group. If the significance criteria is relaxed, Performance may also be associated with Leadership in the Male group \( (p = 0.069) \) and with Opportunity Detection \( (p = 0.06) \) in the Female group.

5.5. Summary of results

A summary of the results can be stated as:

1. The male group presented significantly \( (p < 0.01) \) higher Opportunity detection, Leadership and Risk-Taking behaviours than the female group;
2. In the Male group, Leadership behaviour is significantly \( (p < 0.1) \) associated with performance;
3. In the Female group, Social and Opportunity Detection behaviour are significantly \( (p < 0.05 \text{ and } p < 0.1, \text{ respectively}) \) associated with performance.

These results can be graphically represented in Figure 3.

6. Discussion

The results indicate that some characteristics of entrepreneurial profile are associated with performance and that there are differences between men and women. While men show an association between leadership and performance, women show an association between performance and social skills and the detection of opportunities. Below, the results are explored and discussed in light of the literature. Some behaviour dimensions are more extensively explored than others, considering the relevance of results and the supporting literature.

6.1. Opportunity detection: gender differences and performance

Men’s higher opportunity detection behaviour may indicate that women embark on entrepreneurial activities more out of necessity than men. However, given the historical and still deeply rooted social context, it is difficult to conclude whether women start their own business by opportunity or by necessity. This motive is, however, associated with age and education. In the context of young women with university degrees, entrepreneurship is seen as an opportunity. In contrast, entrepreneurship by necessity is identified in companies with a more traditional and less innovative profile with older women and more limited qualifications (Pablo-Martí et al., 2014). Male entrepreneurs attribute more importance to careers based on the status provided by the ownership of a firm, while female entrepreneurs assign more value to socio-emotional careers, such as those with close relationships with employees and customers (Laguía et al., 2019). This study corroborates the findings of others that also identified women as having more difficulties in detecting opportunities; and when they do, they may be in the midst of a transition process, such as motherhood (Lewis et al., 2016). Similar results were found in Brazil by Bulgacov et al. (2017):

(...) the Brazilian entrepreneurial women is just reacting to the environment in order to care for their needs, and are not yet in a proactive condition, characteristic of entrepreneurial action, which has components of consciousness, imagination, creativity and innovation, constituting the opportunity entrepreneurship (p. 347, freely translated by the authors).

The relationship between performance and the identification of opportunities for women leads us to reflect on whether a positive relationship between them is to be expected. The reasons that indicate this result are the aversion that women have for taking risks (Frankel, 2007) and the need to start their own business when the scenario changes, such as motherhood (Lewis et al., 2016). In this sense, when they identify an opportunity, they realize their potential and possibility for growth.

6.2. Self-efficacy: gender differences and performance

Self-efficacy is characterized by the belief that the individual can control internal and external resources to succeed in his project. When the studies specifically focused on entrepreneurial self-efficacy, the

| Table 4. Factor mean differences between genders. |
|-----------------------------------------------|
| Factor            | Estimate | S.E. | C.R. | P  | Label      |
| OppDetect         | -.390    | .064 | -6.135 | *** | mn_OppDetect |
| SelfEffic         | -.048    | .051 | -.946  | .344 | mn_SelfEffic |
| Leader            | -.170    | .054 | -3.118  | .002 | mn_Leader  |
| Planner           | .112     | .072 | 1.568  | .117 | mn_Planner |
| Social            | .043     | .056 | .769  | .442 | mn_Social |
| RiskTaker         | -.268    | .058 | -4.665 | *** | mn_RiskTaker |

Source: SPSS AMOS output.
results were not unanimous. Most gender studies indicate that self-efficacy is greater in men than in women (Arshad et al., 2016; Chowdhury et al., 2019; Ladd et al., 2019; Shneor et al., 2013; Vamvaka et al., 2020). However, no studies were found demonstrating the opposite: a higher level of self-efficacy in women than in men. This study’s results corroborate those of a third group of studies (Mueller and Dato-On, 2008, 2013), suggesting no differences in the perception of self-efficacy between men and women, contributing to the debate on the topic. In this case, results may be linked to the level of education of the subjects contemplated in the study, all of whom are in a higher education course. Considering that in Brazil only 21% of young people complete higher education (OECD, 2019) it is expected that individuals who are in this situation have a greater perception of self-efficacy, regardless of gender. The relation between self-efficacy with performance, however, was not found.

6.3. Leadership: gender differences and performance

Leadership is a strong characteristic of the entrepreneur. It is interesting to note that the results in relation to leadership, both the difference between genders and its influence on performance, may be related to cultural and social issues. Women are more reticent to embrace workloads that demand greater dedication in the professional field. When women choose entrepreneurship, they are usually influenced by family responsibility, a decision related to their personal and professional life, and a culture which requires them to be still responsible for family care. In this context, it is to be expected that they, as well as others in the professional environment, do not perceive themselves as leaders and even doubt their leadership capacity. According to Pablo-Martí et al. (2014), men become entrepreneurs to be leaders and bosses and women seek personal fulfilment. Women may also be afraid of assuming leadership positions after a predominantly male history in this role (Carreira
et al., 2001; Frankel, 2007). For many years there was a sense that women would not be used to power and that could still interfere with the idea of how they represent their abilities (García-Palma e Molina, 2016). Besides cultural issues, social matters may also influence these results. Because women understand that power isolates contact with other people, they may develop an aversion to leadership (Carreira et al., 2001). As women tend to socialize and, to some extent, avoid conflict, they end up taking on tasks on their own rather than distributing them (Guzman and Kacperczyk, 2019). Hisrich et al. (2014) emphasize that women tend to be more flexible than men and, in turn, men end up being more respected in the hierarchy than women. Also, women face a hard workday and wish to contribute to society to a greater extent than men and, to a certain extent, with less interest in making money than men (García-Palma and Molina, 2016; Pablo-Martí et al., 2014).

The aspects above corroborate with this research in which leadership in the male group is related to business performance. Still, there is a possibility that women have a perception of inferior performance due to the aversion to leadership and power, added to the interests of contributing in a more positive way to the development of society and not only in the results of their enterprise.

6.4. Planner dimension: gender differences and performance

The planner dimension also did not present any gender differences in this study. For women, planning behaviour is associated with clarity regarding their professional objectives (Frankel, 2007). As for men, this behaviour relates to greater objectivity, action and problem solving (Carreira et al., 2001). Our results seem to indicate that these antecedents to the planning behaviour, in spite of their approach differences (Dean et al., 2019), yield similar results for both genders.

6.5. Social dimension: gender differences and performance

The results of this study indicate that there is no significant difference in social skills between men and women. However, it is possible that the network structure between them (Hisrich et al., 2014; Vale et al., 2011). Regardless of gender, the development of social abilities needs to be constantly changing, based on the market dynamic. For this, entrepreneurs build networks of relationships with other actors in their environment, whether with other companies or foreign firms, so that they are able to explore market opportunities (Vale et al., 2011). In Brazil, the social dimension of women entrepreneurship is relatively recent, but evolving to a central research issue (Gimenez et al., 2017).

Ribes-Giner et al. (2018) highlight that the social environment mediates the female learning process. There is a specific configuration in men and women in relation to the role played by knowledge. Women identify more clearly the social skills needed for entrepreneurship and have natural characteristics such as greater commitment, empathy, sensitivity. In this sense, the relationship with performance and social skills of women can be explained.

Hisrich et al. (2014) believe that women can better succeed in companies in the service area, as it welcomes the ease of relating to people, enabling an innovative and differentiated aspect in working relations. Pablo-Martí et al. (2014) also point out that women's personal characteristics, motivation, and management style, especially their commitment to product and service innovation, open the way for the development of policies aimed at innovation.

6.6. Risk-taking: gender differences and performance

Our results show a risk-taking behaviour more developed in men than in women. Men tend to excel in relation to women, as women seem to be more reticent to take financial risks. The start of an enterprise requires great concentration and task orientation, generating difficulties to the entrepreneurial woman, as it means renouncing to some achievements and bringing uncertainties (Dean et al., 2019; Santos et al., 2016). Therefore, entrepreneurial women might be afraid of the financial loss that a new opportunity may generate (Lagúia et al., 2019; Lechner et al., 2018), resulting in women-led ventures 63% less likely to obtain external funding than those led by men (Guzman and Kacperczyk, 2019).
However, women who decide to take risks tend to be successful, as they plan the execution of the entire process and are resilient in the face of difficulties (Frankel, 2007).

7. Conclusion

The objective of this study was to identify the gender differences that exist in the entrepreneurial behaviour and business performance of undergraduate students of two universities from the south region of Brazil. The results presented here offer the opportunity to identify differences in the entrepreneurial profile among students in three of the six dimensions contemplated in the study. The male group presented higher Opportunity detection, Leadership and Risk-Taking than the female group. No gender differences were found in the Self-efficacy, Social and Planning dimensions. Even with the increased number of women in universities and the social advances contemporaneously conquered, women entrepreneurs still suffer from a culture that significantly affects their entrepreneurial development and confidence in their skills. For men group, the study found that the performance of their own business is associated with their behaviour as a leader, while for women performance is associated with the detection of opportunities and social skills. It is important to highlight that, although women have greater difficulty than men in identifying opportunities, this behaviour is positively related to performance. For men, the question of power linked to leadership, may partly explain the relationship with the perception of business performance. This research sought to show the extent to which these differences can be evidenced in relation to behaviour dimensions of men and women and their relationship with the perception of company's performance.

As these results are relative to the university environment, some considerations about this context may be fruitful. Entrepreneurship education may at least partly offset the negative impact of cultural stereotypes which hold that women are less fit for entrepreneurial careers, and the earliest this education comes in our lives, the more effective it will be (Wilson et al., 2009). Therefore, entrepreneurship training in higher education has been gaining space on the academic debate agenda. The actions developed by higher education institutions, such as individual incentives for students (Morris et al., 2013), the development of hands-on educational programs (Pluzhnik et al., 2018) and the interaction with the resource availability available at universities (Mutilturk and Mardikyan, 2018) stimulate entrepreneurial initiative. Higher education generally improves women's self-perception of their entrepreneurial skills, thus contributing to their entrepreneurial intentions (Chowdhury et al., 2019; Thébaut, 2010). However, it is understood that responses between entrepreneurial genders may also be different (Nowinski et al., 2019; Wilson et al., 2007). In that context, universities can develop the entrepreneurial training of men and women more precisely considering the differences found here.

The results of this study also contribute to public policymakers to promote processes that minimize gender differences or work towards their complementarity. After all, even with all the efforts and work already done, it is still necessary to create techniques to address these issues. Through the literature, it is possible to notice advances. However, there is still a way to go since, in this study, women presented higher levels than men in none of the dimensions of entrepreneurial behaviour. For example, due to the characteristics of the female context, it would be expected that women had a higher score in the development of social skills. Emphasizing the historical context is also necessary for women to be aware that what they face today is something that was built in the past. In this way, they can motivate themselves to develop entrepreneurial skills.

Limitations are not absent in this study. Despite the large sample, the findings of this study are limited to the selected empirical environment. Additional studies on gender, especially outside the university context and in other regions of Brazil are suggested, so that it is possible to widen the discussions on these topics.

Declarations

Author contribution statement

Serie Schmidt: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.
Maria Cristina Bohnenberger: Conceived and designed the experiments; Performed the experiments; Wrote the paper.
Christine Hermann Nodari: Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.
Mayla Drielle Joiner Santos Silva: Analyzed and interpreted the data; Wrote the paper.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data availability statement

The authors do not have permission to share data.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

References

Almeida, J.G., Santos, E.J., Ferreira, J.A., Albuquerque, C.P., 2013. Desemprego e empreendedorismo: da ambiguidade da relação conceitual à eficácia das práticas de intervenção social. Pravda-Revista de Ciências Sociais 20 (1), 31-56.
Andersen, J.C., Gerbing, D.W., 1988. Structural equation modeling in practice: a review and recommended two-step approach. Psychol. Bull. 103 (3), 411–423. http://management.uta.edu/Casper/6314/Start%20%20SEM%20-%20Anderson%20&%20Ger
bing.pdf.
Ashby, M., Farooq, O., Sultana, N., Farooq, M., 2016. Determinants of Individuals’ Entrepreneurial Intentions: A Gender-Comparative Study. Career Development International.
Baggio, A.F., Baggio, D.K., 2015. Empreendedorismo: conceitos e definições. Revista de Empreendedorismo, Inovação e Tecnologia 1 (1), 25–38.
Birley, S., Muyza, D.F., 2001. Dominando Os Desafios Do Empreendedor. Makron Books.
Bulgacov, Y.L.M., de Camargo, D., da Cunha, S.K., Meza, M.L., Souza, R.M.B., da Rosa Tofoi, S., 2017. Atividade empreendedora da mulher brasileira: trabalho precário ou trabalho decente? Psicologia Argomento 28 (63).
Byrne, B.M., 2016. In: Francis, T.a. (Ed.), Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming, third ed. ed. Routledge.
Cameo-Ordaz, C., Díaz-Gonzáles, J.P., Ruiz-Navarro, J., 2016. The influence of gender on entrepreneurial intention: the mediating role of perceptual factors. BBQ Bus. Res. Q. 19 (4), 261–277.
Carreira, D., Ajamil, M., Moreira, T., 2001. Mudando O Mundo: a Liderança Feminina No Século 21. Cortez.
Chowdhury, S., Endres, M.L., Frye, C., 2019. The influence of knowledge, experience, and education on gender disparity in entrepreneurial self-efficacy. J. Small Bus. Enterpren. 31 (5), 371–389.
Dean, H., Larsen, G., Ford, J., Abram, M., 2019. Female entrepreneurship and the metanarrative of economic growth: a critical review of underlying assumptions. Int. J. Manag. Rev. 21 (1), 24–49.
Díaz-García, M.C., Jiménez-Moreno, J., 2010. Entrepreneurial intention: the role of gender. Int. J. Entrepreneur Manag. J. 6 (3), 261–283.
Dornelas, J., 2018. Empreendedorismo No Brasil 2018. https://databsebrae.com.br/wp-content/uploads/2018/02/Rel%2C%20Rio-Executivo-Brasil-2018-c3-web.pdf.

GEM, 2018. Empreendedorismo No Brasil 2018. https://databsebrae.com.br/wp-content/uploads/2018/02/Rel%2C%20Rio-Executivo-Brasil-2018-c3-web.pdf.

García-Palma, M.B., Molina, M.I.S.-M., 2016. Knowledge and female entrepreneurship: a comparison of social and cultural dimensions. Suma de Negocios 7 (15), 32

Díaz-García, M.C., Jiménez-Moreno, J., 2010. Entrepreneurial intention: the role of gender. Int. J. Manag. Rev. 21 (1), 24–49.

Díaz-García, M.C., Jiménez-Moreno, J., 2010. Entrepreneurial intention: the role of gender. Int. J. Manag. Rev. 21 (1), 24–49.

Fellnhofer, K., Puumalainen, K., Sjögren, H., 2016. Entrepreneurial orientation and performance – are sexes equal? [Article]. Int. J. Entrepreneurial Behav. Res. 22 (3), 346–374.

Frankiel, L.P., 2007. Mujeres Lideran Mejor Que Hombres. Editora Gente.

Frankiel, L.P., 2007. Mujeres Lideran Mejor Que Hombres. Editora Gente.

Frankiel, L.P., 2007. Mujeres Lideran Mejor Que Hombres. Editora Gente.

Frankiel, L.P., 2007. Mujeres Lideran Mejor Que Hombres. Editora Gente.
Morris, M.H., Webb, J.W., Fu, J., Singhal, S., 2013. A competency-based perspective on entrepreneurship education: conceptual and empirical insights. J. Small Bus. Manag. 54 (1), 49–66.

Schmidt, S., Bohnenberger, M.C., Panizzon, M., Silvana Regina Ampessan, M., Toivonen, E., Lampinen, M., 2018. Students entrepreneurial behaviour: an eight-construct scale validation. Int. J. Enterpren. 22 (2), 1–20. https://www.abacademies.org/articles/students-entrepreneurial-behaviour-an-eight-construct-scale-validation-7254.html

Schumpeter, J.A., 1934. The Theory of Economic Development: an Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle, 55. Transaction publishers.

Sirec, K., Mocnik, D., 2014. Gender-based differences in the performance of Slovenian high-growth companies. In: Women’s Entrepreneurship in the 21st Century: an International Multi-Level Research Analysis, pp. 165–185.

Stolte, A., Sailer, K., Gillig, H., 2018. Entrepreneurial mindset as a driver for digital transformation - a novel educational approach from university-industry interactions. In: Proceedings of the European Conference on Innovation and Entrepreneurship. ECIE.

Thebaud, S., 2010. Gender and entrepreneurship: a career choice: do self-assessments of ability matter? Soc. Psychol. Q. 73 (3), 288–304.

Thebaud, S., 2015. Business as plan B: institutional foundations of gender inequality in entrepreneurship across 24 industrialized countries. Adm. Sci. Q. 60 (4), 671–711.

Thebaud, S., 2016. Passing up the job: the role of gendered organizations and families in the entrepreneurial career process. Enterpren. Theor. Pract. 40 (2), 269–287.

Vale, G.M.V., Serafim, A.C.F., Teodosio, A.d.S.d.S., 2011. Gênero, imersão e empreendedorismo: sexo frágil, laços fortes? Revista de Administração Contemporânea 15 (4), 631–649. http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1413-65522011000400005&tlng=pt.

Vañaca-Arias, J.A., Marulanda-Valencia, F.A., 2019. Evolution and research trends in entrepreneurial self-efficacy: a bibliometric analysis. Estud. Gerenciales 35 (151), 219–232.

Vazquez, V., Stofors, C., Palasaks, T., Botarsa, C., 2020. Attitude toward entrepreneurship, perceived behavioral control, and entrepreneurial intention: dimensionality, structural relationships, and gender differences. J. Innovat. Enterpren. 9 (1), 5.

Wilson, F., Kickul, J., Marlin, D., 2007. Gender, entrepreneurial self-efficacy, and entrepreneurial career intentions: implications for entrepreneurship education. Enterpren. Theor. Pract. 31 (3), 387–406.