https://bar.anpad.org.br
BAR – Brazilian Administration Review
Vol. 19, No. 4, Art. 5, e220005, 2022
https://doi.org/10.1590/1807-7692bar2022220005


Research Article

# A Chip off the Old Block? Effects of Gender Homophily on Intergenerational Transmission of Entrepreneurial Behavior

Felipe Luiz Neves Bezerra de Melo[1]
Ana Maria Jerônimo Soares[2]

[1] Instituto Federal de Educação, Ciência e Tecnologia do Rio Grande do Norte, Nova Cruz, RN, Brazil
[2] Universidade Federal do Rio Grande do Norte, Natal, RN, Brazil

**Received January 17, 2022. This paper was with the authors for two revisions. Accepted October 13, 2022.**
**First published online November 10, 2022.**
**Editor-in-Chief:** Ivan Lapuente Garrido (Universidade do Vale do Rio dos Sinos, Brazil).
**Associate Editor:** Gustavo Barrera Verdugo (Universidad de Las Américas, Chile).
**Reviewers:** Alex Fernando Borges (Universidade Federal de Uberlândia, Brazil), Haedar Akib (Universitas Negeri Makassar, Indonesia) and two anonymous reviewers.
**Editorial assistants:** Kler Godoy and Simone Rafael (ANPAD, Maringá, Brazil).

## ABSTRACT

The intergenerational transmission is one of the key variables that shape entrepreneurship as an occupational choice. However, the role of gender is still a gap in the literature on intergenerational transmission of entrepreneurial behavior. Thus, this study aims to assess the effect of gender homophily in the intergenerational transmission of entrepreneurial behavior. The sample was composed of 10,889 students from the Federal Institute of Technology of Rio Grande do Norte. The probit regression method was applied to measure the probability of an individual becoming an entrepreneur if they are born of an entrepreneurial father or mother. The results show that being an offspring of an entrepreneurial father or entrepreneurial mother is associated with an increase in the probability of an individual becoming an entrepreneur. Moreover, the transmission is increased when the entrepreneurial parent and the offspring share the same gender.



**Keywords:** intergenerational transmission; entrepreneurial behavior; gender homophily

**JEL Code:** J010

# INTRODUCTION

Individuals develop occupational expectations using their social networks as a reference, particularly with people they consider close and similar (Kilic & Kuzey, 2016; Mugwati & Bakunda, 2019). Regarding the intergenerational transmission of entrepreneurial behavior, the family represents a source of information and inspiration (Staniewski & Awruk, 2021), since parents are important socializing agents that influence the interests of their children's entrepreneurial career (Mishkin, 2021; Moreno-Gómez et al., 2019). The literature shows that having entrepreneurial parents is positively related to an increase in the probability of subjects becoming entrepreneurs (Mishkin, 2021). Thus, this transmission of entrepreneurial behavior, according to the social learning theory (Bandura, 1986), is mediated not only by observation but also by social interaction with parents (Mishkin, 2021; Staniewski & Awruk, 2021). Previous studies have explored several factors that explain these results. This includes genetic factors (Nicolaou & Shane, 2009; 2010; Nofal et al., 2018), financial support (Welsh & Kaciak, 2019), transmission of values related to entrepreneurship (Colombier & Masclet, 2008; Wyrwich, 2015), the role of parents as role models for their children (Hoffmann et al., 2015; Laspita et al., 2012; Lindquist et al., 2015; Staniewski & Awruk, 2021), and how gender moderates such an effect (Mishkin, 2021; Moreno-Gómez et al., 2019).

Despite intergenerational transmission being widely recognized as a key variable in choosing entrepreneurship as a career (Hopp et al., 2019; Mishkin, 2021; Sahinidis et al., 2019; Staniewski & Awruk, 2021), few studies, however, have investigated this process, emphasizing the importance of verifying heterogeneous effects according to the gender of parents and children (Moreno-Gómez et al., 2019) and the literature has referred to this attraction for similarity as gender homophily, indicating that the enterprising father exerts greater influence on sons than on daughters and, in turn, the mother exerts greater influence on daughters (Laspita et al., 2012; Hoffmann et al., 2015; Mishkin, 2021; Moreno-Gómez et al., 2019). Thus, knowledge about this mechanism can increase the understanding of gender dynamics in the transmission of entrepreneurship, which, more generally, is an issue still little explored (Mishkin, 2021; Moreno-Gómez et al., 2019).

Given this gap, the aim of this article is to assess whether gender is associated with the intergenerational transmission of entrepreneurial behavior. Thus, the main hypothesis of this study is that the intergenerational transmission of entrepreneurial behavior is influenced by gender homophily, that is, the effect is potentiated if parents and children share the same gender (Chlosta et al., 2012; Hoffmann et al., 2015; Laspita et al., 2012; Lindquist et al., 2015). This study therefore highlights the importance of two determinants of entrepreneurial behavior: the influence of entrepreneurial parents and gender homophily, highlighting how they work together to support aspirations for entrepreneurship as a career.

To achieve the proposed objective, we selected the probit regression method as an identification strategy. The sample is composed of 10,889 students from the Federal Institute of Rio Grande do Norte — IFRN, Brazilian institution that is a member of the Federal Network of Professional, Scientific and Technological Education, established by Law No. 11,892/2008 (Lei n. 11.892, 2008). The main areas of activity of the institutions of the Federal Network are professional and

technological education, but its scope extends from elementary school to the *stricto sensu* doctorate.

The results show that being the child of an entrepreneurial father or mother is associated with an increase in the probability of an individual becoming an entrepreneur. In addition to the fact that the intergenerational transmission of entrepreneurial behavior is a substantial variable that explains entrepreneurship, gender homophily can potentiate this effect, which means that the probability of opening a business is greater in the cases of father-son and mother-daughter dyads. It is noteworthy that much evidence on the subject in question encompasses contexts in developed countries (Chlosta et al., 2012; Laspita et al., 2012). However, as will be presented in the literature review section, evidence for developing countries is scarce, especially in Latin American countries (Moreno-Gómez et al., 2019; Romaní et al., 2021; Urbano & Alvarez, 2014). Therefore, the present research sheds light on intergenerational transmission in Brazil, a country in Latin America, in which the strengthening of entrepreneurship is vital for socioeconomic development and the generation of employment and income. Thus, knowing these particularities will also contribute to the design of public policies aimed at the reality of each country (Romaní et al., 2021).

Therefore, although the literature on gender and entrepreneurship is well established, the main contribution of this research is to shed light on the association between intergenerational transmission by gender homophily and the entrepreneurial behavior of the individual — which, although it is discussed, still has a substantial part of factors that have not been explained. In addition, from a methodological point of view, these findings allow us to use parents' occupational choice as an instrumental variable of their children's entrepreneurial occupational choice in econometric and quantitative models.

The rest of the article proceeds as follows: Section 2 makes a brief review of the empirical literature. Section 3 describes the data, sample selection, variables, analysis strategy, and descriptive statistics. Section 4 examines and discusses the results. Finally, Section 5 presents the conclusions of the article.

## THEORETICAL FRAMEWORK

### Intergenerational transmission of entrepreneurial behavior

There is no single definition of 'entrepreneur' that is uniformly accepted in the literature (Filion, 2021; Gartner, 1988). The term is widely used to refer to one who executes new ideas and creates new businesses, through the congruence between innovation, recognition of opportunities, risk management, action, use of resources, and added value (Filion, 2021). Thus, the entrepreneurial individual is an economic actor of change (Boutillier, 2021) and, as such, is able to identify an opportunity to start their own business and take the risk of executing such an idea, in order to create/produce a new good or even something that already exists in an innovative way (Filion, 2021; Gartner, 1988).

The decision to become an entrepreneur involves deliberate and conscious cognitive processing (Krueger et al., 2000). In summary, the willingness/desire that an individual has to get involved with opening a new business represents their entrepreneurial intent (EI) and provides the basis for the execution of a business idea, through attitudes and characteristics such as seeking information and recognizing opportunities, persistence, propensity to take calculated risks, initiative, networking, planning, among other attributes (Anwar et al., 2022; Krueger et al., 2000). This set of characteristics and attitudes is associated with entrepreneurial behavior (EB) (Kumar & Shukla, 2022; McClelland, 1987). However, the relationship between entrepreneurial intention and behavior becomes a complex process, given the influence of social and contextual/environmental factors on such conceptions (Kumar & Shukla, 2022).

Entrepreneurial intent (EI) can be defined as a conscious state of mind and spirit, which reflects an individual's willingness and/or desire to start a business (Liñán & Chen, 2009), preceding, therefore, the action/decision to undertake a business venture (Fini et al., 2012; Liñán & Fayolle, 2015). In other words, EI involves situational and personal characteristics, representing the individual's predisposition to perform a certain behavior and, in this case, their tendency to become an entrepreneur (Fayolle & Gailly, 2015; Liñán & Chen, 2009; Liñán & Fayolle, 2015). Entrepreneurial behavior (EB) encompasses a set of behavioral characteristics that may be more linked to successful entrepreneurs (McClelland, 1987). Thereby, McClelland (1987) was one of the first scholars to argue that the motivation to undertake a business venture is associated with three types of needs: (a) achievement (relates to success); (b) power (leadership and influence to others); and (c) affiliation (association and interpersonal relationships). Additionally, entrepreneurial behavior brings together personality traits and attributes such as: innovation, leadership, creativity, initiative, learning ability, optimism, results orientation, self-confidence, flexibility, among other profiles (Filion, 2021; Gartner, 1988).

Thus, entrepreneurial behavior can be predicted by entrepreneurial intention (Kumar & Shukla, 2022), that is, EI becomes the prerequisite for carrying out EB (Filion, 2021; Gartner, 1988). Previous literature strengthens this argument, assuming that entrepreneurial intentions are a predictor of entrepreneurial behavior, so that the will to undertake a business venture leads the individual to have attitudes and behavioral characteristics to carry out such activity (Anwar et al., 2022; Fayolle & Gailly, 2015; Krueger et al., 2000).

Recent studies have pointed out that the entrepreneurial intention of an individual is influenced by different personal, emotional, cognition, and contextual/institutional factors, being an exhausting task for researchers to predict and explain how entrepreneurial intention can be transformed into real attitude, that is, entrepreneurial behavior (Fayolle & Gailly, 2015; Krueger et al., 2000), since by affecting the intention to start a new business, one therefore affects actual entrepreneurial behavior (Anwar et al., 2022; Kumar & Shukla, 2022).

Throughout life, individuals are influenced by different sources of learning, which can guide them to pursue an entrepreneurial career (Hopp et al., 2019; Sahinidis et al., 2019) and, in this perspective, the family is a factor of great importance, due to the social proximity (Criaco et al., 2017; Hoffmann et al., 2015; Lindquist et al., 2015). In this way, the family environment is an important vector for entrepreneurial cognitions and intentions (Wyrwich, 2015) and, especially,

the figure of the parents represents the biggest influence in the decisions of the children to become entrepreneurs (Chlosta et al., 2012; Hopp et al., 2019; Moreno-Gómez et al., 2019; Staniewski & Awruk, 2021).

Parent entrepreneurship can serve as a source of information and inspiration to pass on entrepreneurial behavior between generations (Hopp et al., 2019). In this way, intergenerational transmission is one of the main variables that explain an individual's decision to start a business (Criaco et al., 2017; Laspita et al., 2012; Lindquist et al., 2015). Some studies indicate that having entrepreneurial parents plays an important role in an individual's decision to become an entrepreneur, with this parental influence being greater than in other types of social interactions (Mishkin, 2021; Sahinidis et al., 2019; Staniewski & Awruk, 2021). Thus, if at least one of the parents (father or mother or both) of an individual has or had a business, the probability of this individual becoming an entrepreneur can increase from 1.25 to 3 times (Arum & Mueller, 2004; Colombier & Masclet, 2008; Criaco et al., 2017; Dunn & Holtz-Eakin, 2000; Hoffmann et al., 2015; Lindquist et al., 2015; Nanda & Sørensen, 2010).

According to Staniewski and Awruk (2021), entrepreneurial behavior is conditioned by the family of origin, so it can be exercised through role models (parents as references for children), good communication, and parental interaction, as well as different attitudes and supports (financial/material or emotional) of the parents.

Overall, the main arguments for parents to influence an individual's decision to start a business are: material support, with capital and resources (Dunn & Holtz-Eakin, 2000; Parker, 2009; Staniewski & Awruk, 2021); social transmission of entrepreneurial behavior through teachings, beliefs, and values (Colombier & Masclet, 2008; Moreno-Gómez et al., 2019; Wyrwich, 2015); genetic and hereditary factors (Nicolaou et al., 2008; Nicolaou & Shane, 2009; 2010; Nofal et al., 2018); and, finally, the fact that parents are references and models of entrepreneurs for their children (Chlosta et al., 2012; Hoffmann et al., 2015; Laspita et al., 2012; Lindquist et al., 2015).

Genetic inheritance as a factor that increases the tendency of individuals to seek entrepreneurship was part of the studies by Nicolaou et al. (2008) and Nicolaou and Shane (2009; 2010). These researchers have identified, in the US context, that the intergenerational transmission of entrepreneurial behavior and the decision to become an entrepreneur are related to genetic factors, as they involve psychological behaviors and chemical reactions in the brain. In addition, genes are responsible for the development of extraversion traits (Nofal et al., 2018), which can facilitate engagement, communication, and the predisposition to start a business, as well as develop people's sensitivity to environmental interactions and influence experiences in entrepreneurial ecosystems.

Colombier and Masclet (2008) also sought to investigate factors that increase the propensity to entrepreneurship of people who have entrepreneurial parents. With a French sample, they identified that having entrepreneurial parents increases the likelihood of an individual becoming an entrepreneur. Additionally, the effect of having an entrepreneurial father is 2.40, while that of having an entrepreneurial mother is 1.35. Furthermore, the authors verified whether this influence was caused by the transmission of financial capital or by the transmission of

entrepreneurial skills. Thus, the parameters of financial inheritances were not statistically significant. This suggests that the intergenerational transmission of entrepreneurial behavior is influenced by occupational heritage.

A survey carried out by Laspita et al. (2012) identified that the transmission of behaviors related to entrepreneurship involves more than one generation, that is, they are transmitted through parent-child relationships as well as grandparents-grandchildren, so such effects differ across regions, given that they are influenced by cultural factors. In summary, the results pointed to a positive and statistically significant effect of the transmission of entrepreneurial intention, by both parents and grandparents. Thus, complementing other studies, the authors argue that in many social contexts, grandparents can have a direct participation both in the coexistence and in the education of the individuals, considering factors such as parents with long working hours and rising divorce rates, which would increase the presence of grandparents in an individual's life. In this sense, grandparents can also be likely role models in the lives of young people with regard to the tendency toward entrepreneurship.

Numerous studies test the role models hypothesis in the transmission of entrepreneurial behavior (Chlosta et al., 2012; Hoffmann et al., 2015; Laspita et al., 2012; Lindquist et al., 2015; Moreno-Gómez et al., 2019; Staniewski & Awruk, 2021). Contributing to this literature, Chlosta et al. (2012) show that both maternal and paternal references exert a direct and statistically significant influence on their children's decision to start a business. They used as theoretical support the social learning theory (Bandura, 1986), assuming that individuals can learn by observation and social interaction, especially with their parents.

Wyrwich (2015) argues that individuals can be influenced in different ways according to their parents' business expertise and their ability to challenge economic and institutional conditions unfavorable to entrepreneurship. The author sought to evaluate the intergenerational transmission of entrepreneurship through a perspective of inheritance of business values. These values were measured through the ability of parents to challenge the existing environment (mastery), an important characteristic of entrepreneurs. Unlike other studies, the author did not consider only the intergenerational transmission of entrepreneurship, but sought to understand the transmission mechanisms of the entrepreneurial perspective.

The results of the study by Wyrwich (2015) indicated that those individuals whose parents grew up in unfavorable environments for entrepreneurship attributed greater value to entrepreneurial skills and a sense of overcoming challenges (mastery) as the main reason that led them to open their own business. Thus, the author does not attribute the transmission of entrepreneurial behavior to direct intergenerational issues, but as a consequence of the entrepreneurial environment that the parents lived, different from previous studies such as those by Lindquist et al. (2015) and Hoffmann et al. (2015).

Although some studies point to different factors to explain the transmission of entrepreneurial behavior between generations, the branches that defend genetic factors stand out, as is the case of Nicolaou et al. (2008), Nicolaou and Shane (2009; 2010), and, more recently, Lindquist et al. (2015). The study carried out by Lindquist et al. (2015), conducted in Sweden with adopted and

biological children, presents interesting results. The effect of entrepreneurial parents on the transmission of entrepreneurial behavior is statistically significant for both biological parents and adoptive parents. Furthermore, the impact of factors produced by the adoptive parents is approximately twice the impact of factors produced by the biological parents (Staniewski & Awruk, 2021).

From this perspective, the family can influence a career plan and the choice of entrepreneurial activity, as well as offer support to the children, such as information, knowledge, and resources for setting up and running their own businesses (Staniewski & Awruk, 2021). In addition, Lindquist et al. (2015) argue that factors related to social coexistence stand out in comparison with genetic factors in the intergenerational transmission of entrepreneurial behavior, contrary to studies by Nicolaou et al. (2008), Nicolaou and Shane (2009; 2010).

The performance of parents in entrepreneurship can offer interesting results for the theoretical body on determinants of entrepreneurial behavior. Criaco et al. (2017) evaluated whether children's perception of their parents' entrepreneurial performance would affect the likelihood of these children becoming entrepreneurs. Social comparison theory was used as a conceptual framework. The authors pointed out that there could be a duality of results, that is, individuals with high-performing parents may carry out negative self-assessments regarding their entrepreneurial capacity, reducing the likelihood of opening a business. On the other hand, individuals with low-performing parents may feel challenged and able to outperform their parents.

Overall, the results identified by Criaco et al. (2017) point out that the parents' business performance perceived by their children positively affects the probability of individuals opening businesses in the future, with the parameters being statistically significant. In addition, business performance positively affects the self-assessment of entrepreneurial ability, as well as the desire to be an entrepreneur.

More recent research has contributed to the literature on the intergenerational transmission of entrepreneurial behavior (Hopp et al., 2019; Mishkin, 2021; Moreno-Gómez et al., 2019; Staniewski & Awruk, 2021). Overall, new business creation is a complex phenomenon (Giménez-Nadal et al., 2022), therefore, the transmission of entrepreneurial characteristics and behaviors from parents to children can be driven by multiple and complementary factors, which can change between countries (Giménez-Nadal et al., 2022; Vladasel et al., 2021). Furthermore, the intergenerational transmission of entrepreneurship seems to be more significant for sons than for daughters (Giménez-Nadal et al., 2022).

It is also highlighted that socialization in the entrepreneurial learning process between generations is an important factor and was addressed in the work by Hopp et al. (2019). The authors suggest that the greater the quality of the process of social interaction between parents and children, the greater the intensity of the effect of the parental model on the transmission of entrepreneurial behavior. Thus, if the individual grew up in an environment with a good social relationship with their parents and had a father and/or mother involved in entrepreneurial activity, they are therefore more likely to start a business. Strengthening the evidence from this

study, Staniewski and Awruk (2021) reinforce that the way communication is established between the members of the family of origin and the degree of satisfaction with family life are important factors for the transmission and business success.

With theoretical support from theory of planned behavior (Ajzen, 1991), Sahinidis et al. (2019) analyzed the extent to which students' perceptions of parental models and their occupations affect the formation of entrepreneurial behavior. The research was carried out with higher education students in five Greek institutions, between the years 2014 and 2015, and identified that the positive effect of parental models was statistically significant when the father or the father and the mother had occupations linked to entrepreneurship. The maternal influence alone was not confirmed in the aforementioned study.

For Giménez-Nadal et al. (2022), the situation of having some involvement in the entrepreneurial activity of both parents is correlated with the tendency of sons and daughters to open businesses in a positive and statistically significant way. Additionally, the father seems to be more important in determining the entrepreneurial behavior of the children, while the mother is more important than the father for the daughters.

In summary, the studies cited in this section showed the effect of the intergenerational transmission of entrepreneurial behavior. The main arguments for such transmission were the inspiring role of parents; social learning theory; and occupational and genetic inheritance (the latter being considerably challenging when operationally testing).

## Influence of parental gender homiphilia on entrepreneurship intention

Defining 'gender' is a complex task for many researchers (Lindqvist et al., 2021), given that, due to historical and sociocultural factors, it is a concept subject to change (Hegarty et al., 2018). Regarding quantitative research, given the characteristics of certain databases, gender is treated as a binary category or dichotomous variable (Lindqvist et al., 2021; Morgenroth & Ryan, 2018), that is, a condition in which a person can identify as male or female (mutually exclusive), this being an accepted operationalization, because this type of research requires answers that can be categorized (Lindqvist et al., 2021).

While the term 'gender' represents a social construct that is not dichotomous (male or female), 'sex' is considered mainly a biological characteristic (Muehlenhard & Peterson, 2011). Thus, there are criticisms about the lack of consistent use of these two terms in academic works, especially in quantitative research (Garvey et al., 2019). However, many researchers when using secondary data need to deal with this methodological barrier, since many data collection instruments are based on binary variables and, for this reason, the analysis of these data will be identifying a result for the biological dimension (sex) and not for the social/cultural construction (gender) (Glasser & Smith, 2008; Muehlenhard & Peterson, 2011).

According to Lindqvist et al. (2021), as in surveys, the subject usually declares themselves to be of a certain gender/sex, female/male response categories are more open and may represent an individual's self-defined gender identity, regardless of their body attributes and gender assigned

at birth (male/female). Some studies in the social science literature suggest the construction of the concept of gender in a broader sense, which is not necessarily linked to biological sex, having a greater relationship with social norms and identity (Morgenroth & Ryan, 2018).

Glasser and Smith (2008) argue that the use of gender and/or sex needs to be clearly differentiated by researchers. It is noteworthy that for the purposes of this research, the database was secondary and considered the gender category (female/male). Thus, it is necessary to bring up this discussion to reinforce that in this study the binary categorization is not an intentional result and it is not intended to generate ambiguity. The analyses and implications will be made, therefore, considering the only two options available in the database, that is, the variables of sex, 'male' and 'female,' so that, as a limitation, the word 'gender' in a broader sense, as a social construct, loses some of its meaning as well as analytical and theoretical potential (Garvey et al., 2019).

Understanding gender and/or sex dynamics is relevant to the study of entrepreneurship. Decisions in the field of intergenerational entrepreneurship are influenced by shared experiences, especially in father-son and mother-daughter dyads (Mishkin, 2021; Moreno-Gómez et al., 2019; 2022). It should be noted that the academic debate on this topic in the field of entrepreneurship brings together studies that used secondary data sets and, for this reason, also used binary variables (Criaco et al., 2017; Laspita et al., 2012; Mishkin, 2021; Moreno-Gómez et al., 2019; 2022).

This principle of interaction between individuals and building bonds based on gender similarities is called gender homophily (Mehta & Strough, 2009). Previous studies cite the theory that the main way in which parents transmit entrepreneurship to their children is for the children to look to their parents as role models. To support this hypothesis, homophily was used as an instrumental variable of reference models, since inspiring admiration is twice as high among people of the same gender (McPherson et al., 2001).

In this sense, the literature points out the relevance of parental support in the probability of the individual becoming a businessman. The hypothesis of transmission of entrepreneurial behavior through role models is the most discussed in the literature and, based on it, the theoretical and empirical development of homophily stands out, in which individuals are more likely to find inspiration in parents of the same gender as their own, as mentioned in Hoffmann et al. (2015) and Lindquist et al. (2015).

Hopp et al. (2019) and Mishkin (2021) corroborate these arguments, highlighting that intergenerational transmission depends on the intensity of socialization between parents and children and that the sharing of experiences and attitudes related to the entrepreneurial career occurs especially between similar genres, that is, in father-son and mother-daughter dyads. Additionally, Moreno-Gómez et al. (2019) also identified that the effect of the transmission of entrepreneurial behavior is moderated by gender, which suggests the potential of gender homophily as a field to be explored in the explanation of the determinants of entrepreneurship.

Corroborating the works by Laspita et al. (2012) and Chlosta et al. (2012), Hoffmann, et al. (2015) analyzed the intergenerational transmission of entrepreneurial behavior through the role models hypothesis for Danish students. As in Chlosta et al. (2012), social learning theory was the basis to support the main study hypotheses. In summary, the results showed that male individuals who have an entrepreneurial father are twice as likely to become entrepreneurs compared to female individuals with an entrepreneurial father. Similarly, the effect of having an entrepreneurial mother is greater for daughters than for sons. The authors attribute such results to role models, in which individuals mirror their parents and learn entrepreneurial behavior, this effect being moderated by gender homophily.

The dynamics of gender homophily was emphasized in some of these studies, as is the case by Moreno-Gómez et al. (2019), which sought to analyze, in the Colombian context, the effect of parental models on the individual's decision to become an entrepreneur and the moderating role of gender in this process.

Moreno-Gómez et al. (2019) argue that the influence of parents as a reference for entrepreneurs for their children is moderated by gender, that is, the father model is more significant for men than for women, demonstrating the influence of homophilic gender networks in the family context as a determinant of entrepreneurial behavior. The study is in line with research by Hoffmann et al. (2015).

As in the study by Moreno-Gómez et al. (2019), gender dynamics in the context of the transmission of entrepreneurial behavior between generations was the focus of research carried out by Mishkin (2021). The aforementioned study demonstrated that having siblings (men) can reduce the effect of intergenerational transmission between fathers and daughters, that is, women with sisters are significantly more likely to be stimulated by parental experiences than women with brothers. Thus, it is suggested that the relationship between father and daughter, in the field of entrepreneurial activity, varies according to the gender of the siblings.

Table 1 summarizes the main articles and findings, in order to guide readers in a better understanding of the identified approaches.

Table 1

**Main approaches to intergenerational transmission in the literature review**

| Transmission factors | Authors/Year | Methods | Main results |
|---|---|---|---|
| Occupational and/or genetic inheritance | Nicolaou et al. (2008) | Structural equation modeling. They studied 870 pairs of homozygous twins and 857 pairs of dizygotic same-sex twins in the UK. | The authors found evidence that genetics is one of the factors that may contribute to the inheritance of entrepreneurial behavior. |
| | Colombier and Masclet (2008) | Probit regression with random effects. French sample of 50,579 individuals, employees, and entrepreneurs, between the years 1994 and 2001. | Having entrepreneurial parents increases the likelihood that an individual will become an entrepreneur, where the effect of having an entrepreneurial father is 2.40, while that of having an entrepreneurial mother is 1.35. |

**Continues**

**Table 1 (continued)**

| Transmission factors | Authors/Year | Methods | Main results |
|---|---|---|---|
| Occupational and/or genetic inheritance | Nicolaou and Shane (2010) | Structural equation modeling, for a sample of 347 homozygous and 303 dizygotic twins in the United States. | Evidence similar to that of Nicolaou et al. (2008) on the transmission of entrepreneurship between generations. However, they also found similar results for other professions, such as teachers, administrators, or salespeople. |
| | Lindquist et al. (2015) | Probit regression. Swedish database composed of 412,183 non-adopted people and 3,941 adopted people who lived in the country from the year 1961. | The influence of adoptive parents was twice that of biological parents in the case of adopted people. |
| Social learning | Chlosta et al. (2012) | Probit regression, with a sample of 461 students from eight German universities. | Individuals who have entrepreneurial parents are more likely to engage in entrepreneurial activity, especially if the father is an entrepreneur or both parents are entrepreneurs. The influence of the mother is a little less. |
| | Wyrwich (2015) | OLS, logistic and probit regressions with 974 entrepreneurs, 479 of whom grew up in East Germany and 495 in West Germany. | Individuals born to parents who grew up in unfavorable environments for entrepreneurship attributed greater value to entrepreneurial skills and a sense of overcoming challenges (mastery) as the main reason that led them to open their own business. |
| | Criaco et al. (2017) | Factor analysis and probit regression. Data is from 33 countries, and was collected in the Global University Entrepreneurial Spirit Students Survey — GUESSS in the years 2013 and 2014. The sample consisted of 21,895 observations. | The results indicate that the parents' business performance perceived by their children positively affects the probability of individuals opening businesses in the future, with the parameter being statistically significant at 1%, and ranging between 0.25 and 0.28. |
| The inspirational role of parents (role models) and gender homophily | Laspita et al. (2012) | Probit regression. Based on the GUESSS database, the sample included 43,764 students from 261 universities in 15 countries. | The results point to a positive and statistically significant influence on 1% of both parents and grandparents. However, when adding both variables, the grandparent effect decreases considerably. |
| | Hoffmann et al. (2015) | Probit regression. The sample ranged from 343,571 individuals (in 1995) to 507,218 (in 2007). | The results indicate a twice-greater probability of a male individual who has an entrepreneurial father in relation to a woman with an entrepreneurial father. The same is true for women daughters of entrepreneurs. |
| | Moreno-Gómez et al. (2019) | Logit model with a sample of 3,703 Colombian university students from GUESSS data. | The influence of parental models on children's entrepreneurial behavior is moderated by gender, that is, the father's model is more significant for men than for women, demonstrating the influence of homophilic gender networks in the family context. |
| | Hopp et al. (2019) | Regression models, with over 2,500 parent-child pairs. | The greater the quality of the process of social interaction between parents and children, the greater the intensity of the parental model's effect on the transmission of entrepreneurial intention. |
| | Staniewski and Awruk (2021) | Multiple regression and a sample of 64 entrepreneurs running successful businesses in Poland. | A potential determinant is the way in which parents convey information and principles to their children, as well as express their views and opinions, without judging or offering non-constructive criticism. |

**Continues**

**Table 1 (continued)**

| Transmission factors | Authors/Year | Methods | Main results |
|---|---|---|---|
| The inspirational role of parents (role models) and gender homophily | Moreno-Gómez et al. (2022) | Logit model in a sample of 15,424 university students in Colombia. | The parental model impacts the decision to become a nascent entrepreneur, so the effect of this impact is moderated by gender. This effect is significant only in the case of the paternal model. |
| | Giménez-Nadal et al. (2022) | OLS regressions, with 64,294 respondents (parents and offspring). | Transmission is mediated by the gender of the parental model and is especially important between parents and children. The transmission is partially explained by a country's legal context for entrepreneurship and its entrepreneurial culture. |

**Note**. Authors' own elaboration.

In summary, Table 1 summarizes the two topics of this literature review section and demonstrates that the studies identified presented different approaches to the family influence on the choice of entrepreneurship as a career and how gender homophily can moderate this relationship.

# MATERIALS AND METHODS

## Methodological design

For Frees (2010), in cases where the dependent variable is binary, probit regression allows the prediction of whether an event of interest may occur or if a research subject presents a characteristic of interest. Due to the binary nature of the dependent variable, we chose to use a probit regression model, which allowed us to obtain a probabilistic and predictive model from the data collected.

For the author, in a regression with dependent variables, if the probability of the response is equal to 1, it can be denoted as $\pi_i = \Pr(y_i = 1)$ and it is a random binary variable, it follows a Bernoulli distribution of expected value $E(y_i) = 0 \times \Pr(y_i = 0) + 1 \Pr(y_i = 1) = \pi_i$ and the variance $Var(y_i) = \pi_i(1 - \pi_i)$.

Therefore, given the linear regression model $Y_i^* = x_i'\beta + u_i$ (linear probability model) where $\beta$ is the parameter to be estimated and Y a dichotomous variable, it can be inferred that:

$$Y_i = \begin{matrix} 1, with\ probability\ F(x_i'\beta) \\ 0, with\ probability\ 1 - F(x_i'\beta) \end{matrix}$$

As a functional form of F(.), Gelman and Hill (2006) claim that the probit model can be described as $\Pr(y_i = 1) = \Phi(X_i\beta)$ where $\Phi$ is the normal cumulative distribution with a distribution function given by:

$$\phi(x) = \int_{-\infty}^{x} \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}t^2} dt$$

and associated probability density described by:

$$\phi(x) = \frac{d\phi(x)}{dx} = \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}x^2}$$

Given that $F(x_i'\beta)$ is not a linear function of $\beta$, the estimation of probit models is usually done by maximum likelihood, which is the estimation method used for the present research.

Corrar, Paulo, and Dias (2012) clarify that the objective of probit regression is to find a probit function formed by weighting the variables (attributes), whose answer allows establishing the probability of occurrence of a certain event and the importance of the variables for this occurrence. Due to the nature of the categorical dependent variable (which will be presented below), we used the probit regression method. We emphasize that the average marginal effects will be used in the presentation of the results, since the functional transformations of the probit coefficients will already be counted from this data presentation format.

## Dependent variable

As an explained variable, a dichotomous metric was used that represents whether an individual did not carry out a business activity in time $t$ – 1, but became a formal entrepreneur at time $t$. This variable was called 'entrepreneur.' This variable represented an objective measure of the profession exercised by an individual. As it is a dummy variable, the value 1 was assigned to those individuals who did not engage in entrepreneurial activity in time $t$ – 1, subject to the restriction that he/she was not an entrepreneur before joining the IFRN, but that he/she became an entrepreneur at a time $t$. We consider entrepreneurs to be those individuals who were registered in the Individual Microentrepreneur program — MEI or with equity interest in any enterprise with the National Registry of Legal Entities — CNPJ in the range of admission as an IFRN student up to a maximum period of five years after leaving the institution, as suggested by Markussen and Røed (2017). The main advantage of this way of estimating entrepreneurial activity is that it allowed to objectively measure whether an individual has become an entrepreneur (Hoffman et al., 2015; Wyrwich, 2015). However, one of the limitations of this estimate is that it only captures the formal character of entrepreneurial activity.

## Variable of interest

Due to the possibility of intergenerational transmission of entrepreneurial behavior (Chlosta et al., 2012; Colombier & Masclet, 2008; Hoffmann et al., 2015; Laspita et al., 2012; Lindquist et al., 2015; Wyrwich, 2015), this study used as variables of interest the parameters 'entrepreneurial father' and 'entrepreneurial mother.' Furthermore, to test the hypothesis of gender homophily in the transmission of entrepreneurial behavior, we used the interaction terms for 'father and son entrepreneurs' and 'mother and daughter entrepreneurs.' The use of these last two interaction terms was motivated to identify the variation between the transmission of entrepreneurial behavior between parents and children of the same sex.

## Control variables

The model was composed of control variables associated with socio-demographic, school, and institutional characteristics. We included as controls the variables 'gender,' 'age,' 'family income,' and 'number of children,' 'academic achievement' (proxy to represent the individual's cognitive ability, being composed of the normalized academic achievement per class in the IFRN), 'management,' 'school attendance,' and 'class shift.' Table 2 summarizes the main controls used and their expected effect.

Table 2

**Control variables**

| Variable | Description | Expected effect | Authors |
|---|---|---|---|
| Sex | Categorical variable, being assigned the value 1 for the male gender, and 0 for the female gender. | Male individuals will be more prone to entrepreneurship | Giannetti and Simonov (2009), Falck et al. (2012), Lerner and Malmendier (2013), and Andersson and Larson (2014). |
| Age | Discrete variable, measured in years. | Non-linear, inverted U-shaped effect | Kautonen et al. (2014), Minola et al. (2016), and Laspita et al. (2012). |
| Family income | Discrete variable, estimated in six distinct income brackets. | Positive effect | |
| Marital status | Categorical variable, with a value of 1 being assigned to married individuals and 0 to other marital statuses. | Positive effect | Colombier and Masclet (2008), Chlosta et al. (2012), Lerner and Malmendier (2013), and Hoffmann et al. (2015) |
| Cognitive abilities | Continuous variable, measured by the IFRN entry grade. | Positive effect | Baron (2003), Caliendo et al. (2012), and Hartog et al. (2010). |
| Management | Categorical variable, with a value of 1 being assigned to courses in the management and business axis, and 0 to other training courses. | Positive effect | Laspita et al. (2012), Peterman and Kennedy (2003), and Souitaris et al. (2007). |
| Natal | Categorical variable, with the value 1 being assigned to individuals from the campuses of the capital of Rio Grande do Norte. | Positive effect | - |
| Frequency | Continuous variable, measured in percentage, representing the absolute frequency of each student. | Positive effect | - |
| Shift | Categorical variable, with the value 1 being assigned to individuals who study during the day shifts. | Positive effect | - |

**Note**. Source: Authors' own elaboration.

## Descriptive statistics

The database is secondary and annual, composed of individuals trained in the IFRN's technical and technologist courses. As inclusion criteria, we considered all graduates who joined the institution between 2001 and 2010. We excluded individuals who dropped out of the course or who underwent voluntary withdrawal. The average age of admission to the institution is 16 years

for students of technical courses, and 18 years for students of technologist and higher education courses.

The technical courses in the integrated modality1 have an average duration of four years, those of the subsequent modality of two years, and the technologist and higher courses have an average duration of three years. The database presents personal, socio-demographic, and educational characteristics of individuals.

Table 3 presents the descriptive statistics of the secondary data used in the research. The base is composed of data stacked between the years 2001 and 2010, totaling 10,889 observations.

Table 3

**Descriptive statistics with stacked data from 2001 to 2010**

| Variables | Obs. | Mean | Standard deviation | Min. | Max. |
|---|---|---|---|---|---|
| Entrepreneur | 10,889 | 0.133 | 0.340 | 0 | 1 |
| MotherEnt | 10,889 | 0.0818 | 0.274 | 0 | 1 |
| FatherEnt | 10,889 | 0.125 | 0.330 | 0 | 1 |
| Coefficient Yield | 10,889 | 78.14 | 6.99 | 60.05 | 100 |
| Income | 10,889 | 3.360 | 1.384 | 0 | 7 |
| Gender | 10,889 | 0.569 | 0.495 | 0 | 1 |
| City of Natal | 10,889 | 0.746 | 0.435 | 0 | 1 |
| Nocturnal | 10,889 | 0.239 | 0.427 | 0 | 1 |
| Management | 10,889 | 0.0190 | 0.137 | 0 | 1 |
| FatherEntClass | 10,889 | 2.879 | 1.865 | 0 | 9 |
| MotherEntClass | 10,889 | 1.878 | 1.609 | 0 | 12 |
| EntClass | 10,889 | 3.055 | 1.917 | 0 | 9 |
| Studentsclass | 10,889 | 23.01 | 6.728 | 10 | 42 |
| %EntClass | 10,889 | 0.133 | 0.0791 | 0 | 0.500 |
| %MotherEntClass | 10,889 | 0.0818 | 0.0679 | 0 | 0.400 |
| %FatherEntClass | 10,889 | 0.125 | 0.0758 | 0 | 0.500 |

**Note**. Source: Authors' own elaboration.

Among the observations of the analyzed period, 13.3% exercised entrepreneurial activity within five years after completing the course at the IFRN. Regarding the parents' profession, 12.5% of

the students were children of an entrepreneurial father, and 8.18% of the students were children of an entrepreneurial mother. On average, the number of enterprising fathers per class was 2.87, and of mothers 1.88. Of the 522 classes analyzed, 50 did not present individuals who had become entrepreneurs in the first five years after completing the course, which represents 9% of the total.

Regarding the gender of the participants, 56.9% of the students are male (6,195 individuals). Approximately 75% of the students came from the campuses of the Central and North Zones of Natal, with the others belonging to the campuses of Mossoró and Currais Novos.

Regarding the profile of the classes, they are composed of a total that varies between 10 and 42 students, with an average number of 23 students. On average, 3.05 students became entrepreneurs, which represents 13.3% of the total under analysis. With regard to entrepreneurial parents per class, on average, 2.88 fathers and 1.88 mothers were in business, representing 12.5% of fathers and 8% of mothers in entrepreneurship per class.

# ANALYSIS OF RESULTS

## Intergenerational transmission of entrepreneurial behavior

To measure the effects of intergenerational transmission of entrepreneurial behavior, we estimated five probit regression models. For a better presentation of the results, the average marginal effect of the variables will be presented (the probit coefficients can be consulted in Appendix A). Table 4 presents the results of the average marginal effect of having entrepreneurial parents.

Table 4

**Marginal model with data stacked from 2001 to 2010**

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Variables | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
| FatherEnt | 0.189*** | 0.190*** | 0.190*** | 0.190*** | 0.190*** |
| | (0.0104) | (0.0101) | (0.0101) | (0.0101) | (0.0101) |
| MotherEnt | 0.163*** | 0.164*** | 0.164*** | 0.164*** | 0.164*** |
| | (0.0125) | (0.0123) | (0.0122) | (0.0122) | (0.0122) |
| MaleSex | 0.0302*** | 0.0298*** | 0.0282*** | 0.0288*** | 0.0286*** |
| | (0.00920) | (0.00899) | (0.00888) | (0.00887) | (0.00885) |
| City of Natal | -0.00488 | -0.00140 | -0.00102 | -0.00192 | -0.00144 |
| | (0.0198) | (0.0166) | (0.0166) | (0.0166) | (0.0166) |
| Family_income | 0.00193 | 0.00372 | 0.00423 | 0.00425 | 0.00447 |
| | (0.00318) | (0.00312) | (0.00310) | (0.00310) | (0.00310) |
| Nocturnal | -0.00343 | -0.00144 | -0.00297 | -0.00158 | -0.00168 |
| | (0.0106) | (0.0105) | (0.0104) | (0.0103) | (0.0103) |
| Management | 0.0214 | 0.0170 | 0.0188 | 0.0243 | |
| | (0.0271) | (0.0273) | (0.0274) | (0.0270) | |
| N_children | 0.0144 | 0.0144 | 0.0139 | | |
| | (0.00963) | (0.00947) | (0.00950) | | |

**Continues**

**Table 4 (continued)**

| | | | | | |
|---|---|---|---|---|---|
| C_income | 0.00110** | 0.000624 | | | |
| | (0.000512) | (0.000454) | | | |
| P_frequency | -0.000115 | | | | |
| | (0.000646) | | | | |
| Correct Classifications | 86.63% | 86.46% | 86.46% | 86.48% | 87.23% |
| Observations | 10,889 | 10,889 | 10,889 | 10,889 | 10,889 |

**Note**. Standard error in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1. Source: Authors' own elaboration.

The variable of interest FatherEnt — which estimates the effect of being the child of an enterprising father — showed a positive and statistically significant parameter at 1% in all five models, with its parameter remaining stable. Thus, being the child of an entrepreneurial father is associated with an increase of approximately 19 percentage points in the probability of an individual becoming an entrepreneur in the first five years after leaving the IFRN, in the analyzed period.

The categorical variable MotherEnt (being the son of an entrepreneurial mother) presented a positive and statistically significant parameter at 1% in the five models, ranging between 0.163 and 0.164. We highlight that the parameter remained stable in view of the sensitivity analysis performed. Thus, being the child of an entrepreneurial mother is associated with an increase of approximately 16.4 percentage points in the individual's probability of becoming an entrepreneur.

Unlike the findings by Chlosta et al. (2012), the parameters of intergenerational transmission of entrepreneurial behavior were similar, varying by approximately two percentage points. In the case of these authors, the entrepreneur father parameter ranged between 0.337 and 0.394. If the mother is an entrepreneur, the parameter ranged between 0.214 and 0.334. It is also noteworthy that, depending on the location, the parameters can vary considerably, given that the participation of women in entrepreneurial activity varies considerably (Chlosta et al., 2012).

The MaleSex variable (categorical variable for male students) also presented a positive and statistically significant parameter, with the beta value varying between 0.282 and 0.302 among the five models. Thus, males are approximately 30 percentage points more likely than females to become entrepreneurs, being in line with Giménez-Nadal et al. (2022) and Moreno-Gómez et al. (2022), who identified greater effects for sons than for daughters.

The variables City of Natal, Nocturnal, Family Income, Number of Children, and Management did not show statistical significance. Given the sex effects found in the model, the next section will test the hypothesis that gender would also affect the intergenerational transmission of entrepreneurial behavior.

## Gender homophily analysis in the intergenerational transmission of entrepreneurial behavior

Table 5 presents the results of estimating gender homophily in the intergenerational transmission of entrepreneurial behavior.

Table 5

**Mean marginal effect of gender homophily**

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Variables | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
| 1.Father#Man | 0.268*** | 0.268*** | 0.269*** | 0.268*** | 0.268*** |
| | (0.0194) | (0.0194) | (0.0194) | (0.0194) | (0.0194) |
| 1.Mother#Woman | 0.220*** | 0.220*** | 0.220*** | 0.220*** | 0.220*** |
| | (0.0216) | (0.0215) | (0.0215) | (0.0216) | (0.0216) |
| Family_income | 0.00210 | 0.00224 | 0.00216 | 0.00206 | 0.00217 |
| | (0.00321) | (0.00321) | (0.00319) | (0.00318) | (0.00318) |
| C_income | 0.00111** | 0.00113** | 0.00114** | 0.00114** | 0.00112** |
| | (0.000512) | (0.000511) | (0.000509) | (0.000508) | (0.000508) |
| P_frequency | -0.00112 | -0.00113* | -0.00112* | -0.00112* | -0.00115* |
| | (0.000680) | (0.000679) | (0.000679) | (0.000679) | (0.000679) |
| N_children | 0.0146 | 0.0153* | 0.0151* | 0.0152* | |
| | (0.00904) | (0.00896) | (0.00893) | (0.00893) | |
| Natal | -0.00555 | -0.00516 | -0.00543 | | |
| | (0.0192) | (0.0192) | (0.0192) | | |
| Nocturnal | -0.00326 | -0.00335 | | | |
| | (0.0105) | (0.0105) | | | |
| Management | 0.0184 | | | | |
| | (0.0287) | | | | |
| Correct Classifications | 86.65% | 86.62% | 86.62% | 86.63% | 86.48% |
| Observations | 10,889 | 10,889 | 10,889 | 10,889 | 10,889 |

**Note.** Standard error in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1. Source: Authors' own elaboration.

When testing the hypothesis of gender homophily, a positive and statistically significant effect on the intergenerational transmission of entrepreneurial behavior is noticed. The first model indicates that being male and the son of an entrepreneurial father is associated with an increase of 26.8 percentage points for this individual to become an entrepreneur. In the case of women being the daughters of an entrepreneurial mother, there is an increase of 22 percentage points in the probability of this woman becoming an entrepreneur.

In this way, we perceive an effect of gender on the intergenerational transmission of entrepreneurial behavior. This transmission can be explained from the perspective of role models (Giménez-Nadal et al., 2022; Lindquist et al., 2015; Moreno-Gómez et al., 2019; 2022). From this point of view, inspirational models have a strong association with the gender, given the sense of similarity and belonging aroused by the gender. Lindquist et al. (2015) still argues that this

transmission could be justified by the way in which the relationship between parents and children of the same sex takes place, indicating, for example, that mothers invest more in the education of their daughters.

Thus, we emphasize that in addition to the intergenerational transmission of entrepreneurial behavior being a considerable explanatory variable of entrepreneurship, we highlight that sex/gender can potentiate this effect through a perspective generated by homophily.

## DISCUSSION OF RESULTS

The results of this study corroborate those by Giménez-Nadal et al. (2022), who identified positive and statistically significant effects for both parents, and additionally by identifying that having entrepreneurial parents (father or mother) is a positive influence on the probability of becoming an entrepreneur. The findings are consistent with previous studies such as those by Criaco et al. (2017) and Moreno-Gómez et al. (2019; 2022), which highlight the increase in men and women's propensity to entrepreneurship, given the role of parental models.

Regarding the results for males, the effects of intergenerational transmission of entrepreneurial behavior were significant for both children with an entrepreneurial mother and children with an entrepreneurial father and do not differ much, although with effects of greater magnitude on the parent-child dyad. These results differ from those presented by Chlosta et al. (2012), who obtained very different effects between father-child and mother-child dyads.

On the other hand, these results are similar to the findings by Criaco et al. (2017), Hoffmann et al. (2015), Lindquist et al. (2015), and Moreno-Gómez et al. (2019; 2022), who also identified positive effects on the intergenerational transmission of entrepreneurial behavior. These results are validated by existing knowledge, that is, according to previous studies, this transmission occurs and can be explained by genetic factors (Nicolaou et al., 2008; Nicolaou & Shane, 2009); inspiration (role models) in the career models exercised by parents (Chlosta et al., 2012; Hoffmann et al., 2015; Laspita et al., 2012; Lindquist et al., 2015; Moreno-Gómez et al., 2019;2022); emotional support from parents and quality of parental interaction/communication (Hopp et al., 2019; Staniewski & Awruk, 2021); financial inheritance and provision of financial and social resources (Dunn & Holtz-Eakin, 2000; Parker, 2009; Welsh & Kaciak, 2019).

Overall, this study provides evidence for the Latin American context, helping to fill the gap pointed out by Moreno-Gómez et al. (2019) and Romaní et al. (2021), who highlight the scarcity of Latin American studies, given that most research has been based on the experience of developed countries. Thus, one implication of this intergenerational transmission of entrepreneurship is that policymakers seeking to foster nascent entrepreneurship among young people can promote parent-focused strategies, since qualifying entrepreneurs and improving their skills generates effects that can 'overflow' to the offspring, increasing the likelihood of sons and daughters entering entrepreneurship. These arguments are consistent with Mishkin (2021), because it points to the fact that investing in parents' entrepreneurial skills can represent a means to encourage their children to choose an entrepreneurial career.

It is worth noting the gender discrepancy identified in the results of this study, which suggests that although there is parental influence in increasing the probability of entrepreneurship, men are more prone than women are. These results also have theoretical and empirical support from previous evaluations such as those by Gupta et al. (2009), Minniti and Nardone (2007), and Shinnar et al. (2012). We emphasize that Brazil is one of the three countries where the rate of female entrepreneurship is higher than the number of male entrepreneurs, as published in a World Bank report (2018).

In this sense, this gender difference can be explained by the historical context of limited participation of women in the Brazilian work environment, country that still has such gender inequality. This argument follows contributions from the previous literature with studies by Gupta et al. (2009) and Thébaud (2010), since these researchers warned that the current scenario of the labor market in general is a consequence of the historical context and past socioeconomic structures. In addition, other factors that may explain this difference are gender stereotypes and behavioral issues such as fear of failure and self-perception of entrepreneurial ability, pointed by Minniti and Nardone (2007) and Shinnar et al. (2012), as well as the difference in risk-taking between genders, cataloged in the literature as women being more averse to the risks involved in entrepreneurial activity, with theoretical and empirical support in Shinnar et al. (2012).

## FINAL CONSIDERATIONS

### Conclusions

The present study aimed to test the hypothesis of intergenerational transmission of entrepreneurial behavior, as well as the effects of gender homophily on this transmission. The results demonstrated a positive and statistically significant association in the inheritance of entrepreneurial behavior. In addition, gender homophily proved to be a potentiator of this transmission. Additionally, men were also more likely to become entrepreneurs.

In summary, the empirical evidence of this study is conclusive on the differences in entrepreneurial activity between men and women (Gupta et al., 2009; Minniti & Nardone, 2007; Shinnar et al., 2012), as well as on gender homophily as a mediating factor in the intergenerational transmission of entrepreneurial behavior. According to the literature, parental models of entrepreneur, given the similarity of sex, influence more strongly on attitudes, contributing to the children's decision to start an entrepreneurial career (Chlosta et al., 2012; Giménez-Nadal et al., 2022; Moreno-Gómez et al., 2019; 2022).

Some points discussed in the literature indicate that the transmission between generations of entrepreneurial behavior can be explained through the social learning theory (inspirational models) (Chlosta et al., 2012; Criaco et al., 2017; Wyrwich, 2015), the development of specific management skills provided through living with parents (Hopp et al., 2019; Staniewski & Awruk, 2021), and the transfer of venture capital obtained by children of entrepreneurs. In relation to gender homophily, the sense of belonging and similarity would be one of the main reasons that would encourage transmission through inspirational models of the same sex (Giménez-Nadal et

al., 2022; Moreno-Gómez et al., 2019; 2022). Although the literature on gender and entrepreneurship is well established, we emphasize that the understanding of intergenerational transmission through gender sheds light on factors associated with entrepreneurial behavior — which, despite being widely debated, still has a considerable portion of unexplained factors.

This work contributes to studies on entrepreneurship, especially in contexts outside of developed countries. As practical implications, understanding the role of parents and their impact on their children's entrepreneurship opens space for policymakers to design policies for the reality of a country like Brazil, in which entrepreneurial activity assumes an important role for socioeconomic development and generation of employment and income, being, sometimes, the only way of accessing sustenance. In addition, another contribution of the work is to present evidence of intergenerational transmission, so that such policies can also be thought with a focus on parents, exploring this factor to stimulate nascent entrepreneurship.

Additionally, the results contribute to the theory, corroborating or not the previous literature, by showing that parental relationships support entrepreneurial intention and behavior and that, even with small differences, these bonds can be stronger according to sex. Thus, fathers (men) can give greater parental support (emotional, affective, verbal, financial/material) to their sons, causing greater influence, given the proximity and biological similarity. The same can happen between mothers and daughters, given that although this study found significant effects of both the role of the father and the mother, the magnitude of the effect was slightly greater when there are similarities in gender.

In summary, although it was not the focus of this work, these results about the role of entrepreneurial parents can be studied as predictors to explain the succession process in family businesses and its determinants. In other words, the findings expand the understanding of the role played by parents and that this transmission consists of a process of 'overflow' of knowledge, attitudes, and preferences in relation to choosing entrepreneurship as a career, whether creating one's own business or continuing a family business. Thus, these discussions also contribute to research in the field of family businesses.

Therefore, this study contributes to this field because (intergenerational) succession in family businesses remains a widely studied topic in the entrepreneurship literature. Despite this attention, little is known about the particularities of succession, in which a father or mother (or both) specifically influence a successor child. Given that, for example, women can often be less involved in the family business as successors because the entrepreneur is the father and not the mother, therefore, it is necessary to understand the process of intergenerational succession in this perspective of the similarity of sex (and even in a broader sense of gender as a social construct) and this research leaves these reflections so that other researchers can explore these questions still open and find new evidence that stronger parental ties (homophily or not) can sustain succession.

## Limitations and future research

As limitations of the study, we highlight that given the nature of the database, it was not possible to estimate the effect of intergenerational transmission of entrepreneurial behavior in the case of

informal entrepreneurial activity, since the data related to entrepreneurship were collected in official records.
Another limitation associated with the data set is that, as it is a secondary base, a broader analysis of gender becomes complex, because the observations consider a binary sex system of individuals (female/male), so that the analysis is limited to how they declare themselves in the biological dimension (sex) and not as a cultural/social product/construction (gender). Thus, further studies are needed to expand this discussion.

Given this limitation, as a suggestion for future studies, we recommend a mixed approach (qualitative and quantitative) that can more adequately capture the gender of individuals through their social/cultural identities. We also emphasize as an avenue for future studies the application of surveys that can capture the informal character of entrepreneurial behavior, as well as to understand objectively which are the transmission channels of this behavior between individuals of the same gender.

## NOTES

1. Students who enter to complete secondary and technical education in an integrated manner.
2. Courses aimed at individuals with secondary education.

## REFERENCES

Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behaviour and Human Decision Processes*, *50*(2), 179-211. https://doi.org/10.1016/0749-5978(91)90020-T

Andersson, M., & Larsson, J. P. (2014). Local entrepreneurship clusters in cities. *Journal of Economic Geography*, 16(1), 39-66. https://doi.org/10.1093/jeg/lbu049

Anwar, I., Thoudam, P., & Saleem, I. (2022). Role of entrepreneurial education in shaping entrepreneurial intention among university students: Testing the hypotheses using mediation and moderation approach. *Journal of Education for Business*, 97(1), 8-20. https://doi.org/10.1080/08832323.2021.1883502

Arum, R., & W. Mueller (Eds.) (2004). *The reemergence of self-employment: A comparative study of self-employment dynamics and social inequality*. Princeton University Press.

Bandura, A. (1986). Social foundations of thought and action. Prentice-Hall.

Baron, R. A. (2003). Human resource management and entrepreneurship: Some reciprocal benefits of closer links. *Human Resource Management Review, 13*(2), 253-256. https://doi.org/10.1016/S1053-4822(03)00016-0

Boutillier, S. (2021). Entrepreneur–The innovative entrepreneur as an actor of economic change. *Innovation Economics, Engineering and Management Handbook* 1: Main Themes (pp. 143-149). https://doi.org/10.1002/9781119832492.ch16

Caliendo, M., & Kritikos, A. (2012). Searching for the entrepreneurial personality: New evidence and avenues for further research. *Journal of Economic Psychology, 33*(2), 319-324. http://dx.doi.org/10.1016/j.joep.2011.06.001

Caliendo, M., Fossen, F., & Kritikos, A. S. (2014). Personality characteristics and the decisions to become and stay self-employed. *Small Business Economics, 42*(4), 787-814. https://link.springer.com/article/10.1007/s11187-013-9514-8

Chlosta, S., Patzelt, H., Klein, S. B., & Dormann, C. (2012). Parental role models and the decision to become self-employed: The moderating effect of personality. *Small Business Economics, 38*(1), 121-138. https://link.springer.com/article/10.1007/s11187-010-9270-y

Colombier, N., & Masclet, D. (2008). Intergenerational correlation in self-employment: some further evidence from French ECHP data. *Small Business Economics, 30*(4), 423-437. https://link.springer.com/article/10.1007/s11187-007-9059-9

Corrar, L. J., Paulo E., Dias, J. M. Filho (2012). *Análise multivariada para os cursos de Administração, Ciências Contábeis e Economia*. Atlas.

Criaco, G., Sieger, P., Wennberg, K., Chirico, F., & Minola, T. (2017). Parents' performance in entrepreneurship as a "double-edged sword" for the intergenerational transmission of entrepreneurship. *Small Business Economics, 49*(4), 841-846. https://link.springer.com/article/10.1007/s11187-017-9854-x

Dunn, T. & D. Holtz-Eakin (2000). Financial capital, human capital and the transition to self- employment: Evidence from intergenerational links. *Journal of Labor Economics, 18*(2), 282-305. https://doi.org/10.3386/w5622

Falck, O., Heblich, S., & Luedemann, E. (2012). Identity and entrepreneurship: do school peers shape entrepreneurial intentions? *Small Business Economics*, 39(1), 39-59. http://doi.org/10.1007/s11187-010-9292-5

Fayolle, A., & Gailly, B. (2015). The impact of entrepreneurship education on entrepreneurial attitudes and intention: Hysteresis and persistence. Journal Of Small Business Management, *53*(1), 75-93. https://doi.org/10.1111/jsbm.12065.

Filion, L. J. (2021). *Defining the entrepreneur.* In World encyclopedia of entrepreneurship. Edward Elgar Publishing. https://doi.org/10.4337/9781839104145.00015

Fini, R., Grimaldi, R., Marzocchi, G. L., & Sobrero, M. (2012). The determinants of corporate entrepreneurial intention within small and newly established firms. Entrepreneurship: *Theory and Practice*, *36*(2), 387–414. https://doi.org/10.1111/j.1540-6520.2010.00411.x

Frees, E. W. (2010). *Regression modeling with actuarial and financial applications*. Cambridge Press.

Gartner, W. B. (1988). "Who is an entrepreneur?" is the wrong question. *American journal of small business*, *12*(4), 11-32. https://doi.org/10.1177%2F104225878801200401

Garvey, J. C., Hart, J., Metcalfe, A. S., & Fellabaum-Toston, J. (2019). Methodological troubles with gender and sex in higher education survey research. *The Review of Higher Education*, *43*(1), 1-24. https://doi.org/10.1353/rhe.2019.0088

Gelman, A., Hill, J. (2006). *Data analysis using regression and multilevel/hierarchical models*. Cambridge ISE.

Giannetti, M., & Simonov, A. (2009). Social interactions and entrepreneurial activity. *Journal of Economics & Management Strategy, 18*(3), 665-709. https://doi.org/10.1111/j.1530-9134.2009.00226.x

Giménez-Nadal, J. I., Molina, J. A., & Velilla, J. (2022). Intergenerational correlation of self-employment in Western Europe. *Economic Modelling, 108*, 105741. https://doi.org/10.1016/j.econmod.2021.105741

Glasser, H. M., & Smith III, J. P. (2008). On the vague meaning of "gender" in education research: The problem, its sources, and recommendations for practice. *Educational Researcher*, *37*(6), 343-350. https://doi.org/10.3102/0013189X08323718

Gupta, V. K., Turban, D. B., Wasti, S. A., & Sikdar, A. (2009). The role of gender stereotypes in perceptions of entrepreneurs and intentions to become an eentrepreneur. *Entrepreneurship theory and practice, 33*(2), 397-417. https://doi.org/10.1111/j.1540-6520.2009.00296.x

Hartog, J., Van Praag, M., & Van Der Sluis, J. (2010). If you are so smart, why aren't you an entrepreneur? Returns to cognitive and social ability: Entrepreneurs versus employees. *Journal of Economics & Management Strategy, 19*(4), 947-989. https://doi.org/10.1111/j.1530-9134.2010.00274.x

Hegarty, P., Ansara, Y. G., & Barker, M. J. (2018). Nonbinary gender identities. Gender, sex, and sexualities: *Psychological perspectives*, 53-76. https://doi.org/10.1093/oso/9780190658540.003.0003

Hoffmann, A., Junge, M., & Malchow-Møller, N. (2015). Running in the family: Parental role models in entrepreneurship. *Small Business Economics, 44*(1), 79-104. https://doi.org/10.1007/s11187-014-9586-0

Hopp, C., Minarikova, D., & Speil, A. (2019). A chip off the old block? How parent-child interactions affect the intergenerational transmission of entrepreneurial intentions. *Journal of Business Venturing Insights*, *11*, e00130. https://doi.org/10.1007/s11187-014-9586-0

Kautonen, T., Down, S., & Minniti, M. (2014). Ageing and entrepreneurial preferences. *Small Business Economics, 42*(3), 579-594. https://doi.org/10.1007/s11187-013-9489-5

Kilic, M. & Kuzey, C. (2016). The effect of board gender diversity on firm performance: evidence from Turkey. *Gender in Management: An International Journal*, *31*(7), 434-455. http://dx.doi.org/10.1108/GM-10-2015-0088

Krueger, N. F., Jr., Reilly, M. D., & Carsrud, A. L. (2000). Competing models of entrepreneurial intentions. *Journal of Business Venturing, 15*, 411-432. https://doi.org/10.1016/S0883-9026(98)00033-0

Kumar, R., & Shukla, S. (2022). Creativity, proactive personality and entrepreneurial intentions: examining the mediating role of entrepreneurial self-efficacy. *Global Business Review, 23*(1), 101-118. https://doi.org/10.1177/0972150919844395

Laspita, S., Breugst, N., Heblich, S., & Patzelt, H. (2012). Intergenerational transmission of entrepreneurial intentions. *Journal of Business Venturing, 27*(4), 414-435. https://doi.org/10.1016/j.jbusvent.2011.11.006

Lei n. 11.892, de 29 de dezembro de 2008. Institui a Rede Federal de Educação Profissional, Científica e Tecnológica, cria os Institutos Federais de Educação, Ciência e Tecnologia, e dá outras providências. https://www.planalto.gov.br/ccivil_03/_ato2007-2010/2008/lei/l11892.htm.

Lerner, J., & Malmendier, U. (2013). With a little help from my (random) friends: Success and failure in post-business school entrepreneurship. *The Review of Financial Studies, 26*(10), 2411-2452. https://doi.org/10.1093/rfs/hht024

Liñán, F., & Fayolle, A. (2015). A systematic literature review on entrepreneurial intentions: citation, thematic analyses, and research agenda. *International Entrepreneurship and Management Journal*, *11*(4), 907-933. https://doi.org/10.1007/s11365-015-0356-5.

Liñán, F., &, Chen, Y. (2009). Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions. *Entrepreneurship Theory and Practice*, 33(3), 593–617. https://doi.org/10.1111%2Fj.1540-6520.2009.00318.x

Lindqvist, A., Sendén, M. G., & Renström, E. A. (2021). What is gender, anyway: a review of the options for operationalising gender. *Psychology & sexuality*, *12*(4), 332-344. https://doi.org/10.1080/19419899.2020.1729844.

Lindquist, M. J., Sol, J., & Van Praag, M. (2015). Why do entrepreneurial parents have entrepreneurial children? *Journal of Labor Economics, 33*(2), 269-296. https://doi.org/10.1086/678493

Markussen, S., & Røed, K. (2017). The gender gap in entrepreneurship-The role of peer effects. *Journal of Economic Behavior & Organization, 134*, 356-373. https://doi.org/10.1016/j.jebo.2016.12.013

McClelland, D. C. (1987). Characteristics of successful entrepreneurs. *The Journal or Creative Behavior*, *21*(3), 219-233. https://psycnet.apa.org/doi/10.1002/j.2162-6057.1987.tb00479.x

McPherson, M., Smith-Lovin, L. & Cook, J. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology*, *27*, 415-444. https://www.proquest.com/docview/199578761#:~:text=By%20interacting%20only%20with%20others,rate%20than%20among%20dissimilar%20people.

Mehta, C. M., & Strough, J. (2009). Sex segregation in friendships and normative contexts across the life span. *Developmental review*, *29*(3), 201-220. https://doi.org/10.1016/j.dr.2009.06.001

Minniti, M., & Nardone, C. (2007). Being in someone else's shoes: the role of gender in nascent entrepreneurship. *Small Business Economics, 28*(2), 223-238. https://doi.org/10.1007/s11187-006-9017-y

Minola, T., Criaco, G., & Obschonka, M. (2016). Age, culture, and self-employment motivation. *Small Business Economics, 46(2),* 187-213. https://doi.org/10.1007/s11187-015-9685-6

Mishkin, E. (2021). Gender and sibling dynamics in the intergenerational transmission of entrepreneurship. *Management Science, 67*(10), 6116-6135. https://doi.org/10.1287/mnsc.2020.3790

Moreno-Gómez, J., Gómez-Araujo, E., & Castillo-De Andreis, R. (2019). Parental role models and entrepreneurial intentions in Colombia. *Journal of Entrepreneurship in Emerging Economies*, *12*(3), 413-429. https://doi.org/10.1108/JEEE-04-2019-0048

Moreno-Gómez, J., Gómez-Araujo, E., Ferrer-Ortíz, D., & Pena-Ruiz, R. (2022). Gender perspective of parental role model influence on nascent entrepreneurs: Evidence from Colombia. *European Research on Management and Business Economics*, *28*(1), 100156. https://doi.org/10.1016/j.iedeen.2021.100156.

Morgenroth, T., & Ryan, M. K. (2018). Gender trouble in social psychology: How can Butler's work inform experimental social psychologists' conceptualization of gender? *Frontiers in Psychology*, 1320. https://doi.org/10.3389/fpsyg.2018.01320

Muehlenhard, C. L., & Peterson, Z. D. (2011). Distinguishing between sex and gender: History, current conceptualizations, and implications. *Sex Roles*, *64*(11), 791-803. https://doi.org/10.1007/s11199-011-9932-5

Mugwati, M., & Bakunda, G. (2019). Board gender composition and marketing effectiveness in the female consumer Market in Zimbabwe. *Gender in Management: An International Journal.* 34(2), 94-120. https://www.emerald.com/insight/content/doi/10.1108/GM-01-2018-0001/full/html

Nanda, R., & Sørensen, J. B. (2010). Workplace peers and entrepreneurship. *Management Science,* 56(7), 1116-1126. https://www.jstor.org/stable/40785246

Nicolaou, N., & Shane, S. (2009). Can genetic factors influence the likelihood of engaging in entrepreneurial activity? *Journal of Business Venturing, 24*(1), 1-22. sciencedirect.com/science/article/abs/pii/S0883902608000025

Nicolaou, N., & Shane, S. (2010). Entrepreneurship and occupational choice: Genetic and environmental influences. *Journal of Economic Behavior & Organization, 76(1),* 314. https://doi.org/10.1016/j.jebo.2010.02.009

Nicolaou, N., Shane, S., Hunkin, J., Cherkas, L., & Spector, T. (2008). Is the tendency to engage in entrepreneurship genetic? *Management Science*, *54*, 167-179. https://doi.org/10.1287/mnsc.1070.0761

Nofal, A. M., Nicolaou, N., Symeonidou, N., & Shane, S. (2018). Biology and management: A review, critique, and research agenda. *Journal of Management*, *44*(1), 7–31. https://doi.org/10.1177/0149206317720723

Parker, S. (2009). *The Economics of entrepreneurship.* Cambridge University Press.

Peterman, N. E., & Kennedy, J. (2003). Enterprise education: Influencing students' perceptions of entrepreneurship. *Entrepreneurship Theory and Practice*, *28*(2), 129144. https://doi.org/10.1046/j.1540-6520.2003.00035.x

Romaní, G., Martins, I., Varela, R. and Pombo, C. (2021). New trends on entrepreneurship research in Latin America and Caribbean countries: Evidence from GEM and GUESSS projects – an analytical editorial. *Academia Revista Latinoamericana de Administración*, *34*(3), 329-342. https://www.emerald.com/insight/content/doi/10.1108/ARLA-09-2021-364/full/html

Sahinidis, A, Stavroulakis, D., Kossieri, E., & Varelas, S. (2019). Entrepreneurial intention determinants among female students. The influence of role models, parents' occupation and perceived behavioral control on forming the desire to become a business owner. In *Strategic Innovative Marketing and Tourism* (pp. 173-178). Springer.

Shinnar, R. S., Giacomin, O., & Janssen, F. (2012). Entrepreneurial perceptions and intentions: The role of gender and culture. *Entrepreneurship Theory and Practice, 36*(3), 465-493. https://doi.org/10.1111/j.1540-6520.2012.00509.x

Souitaris, V., Zerbinati, S., & Al-Laham, A. (2007). Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources. *Journal of Business Venturing, 22*(4), 566-591. https://doi.org/10.1016/j.jbusvent.2006.05.002

Staniewski, M. W., & Awruk K. (2021). Parental attitudes and entrepreneurship success. *Journal of Business Research*, *123*, 538-546. https://doi.org/10.1016/j.jbusres.2020.10.039

Thébaud, S. (2010). Gender and entrepreneurship as a career choice: do self assessments of ability matter? *Social Psychology Quarterly, 73*(3), 288-304. https://doi.org/10.1177/0190272510377882

Urbano, D., & Alvarez, C. (2014). Institutional dimensions and entrepreneurial activity: an international study, *Small Business Economics*, *42*(4), 703-716. https://doi.org/10.1007/s11187-013-9523-7.

Vladasel, T., Lindquist, M. J., Sol, J., & Van Praag, M. (2021). On the origins of entrepreneurship: Evidence from sibling correlations. *Journal of business venturing*, *36*(5), 106017. https://doi.org/10.1016/j.jbusvent.2020.106017

Welsh, D. H., & Kaciak, E. (2019). Family enrichment and women entrepreneurial success: The mediating effect of family interference. *International Entrepreneurship and Management Journal*, *15*(4), 1045–1075. https://doi.org/10.1007/s11365-019-00587-4

World Bank. (2018). *Doing business 2018*: Reforming to create jobs. The World Bank. https://doi.org/10.1596/978-1-4648-1146-3

Wyrwich, M. (2015). Entrepreneurship and the intergenerational transmission of values. *Small Business Economics, 45*(1), 191-213. https://doi.org/10.1007/s11187-015-9649-x

## Authors' contributions

**1st author:** conceptualization (lead), data curation (lead), formal analysis (lead), investigation (equal), methodology (lead), project administration (lead), software (equal), supervision (equal), validation (equal), visualization (lead), writing – original draft (lead), writing – review & editing (equal).

**2nd author:** conceptualization (supporting), data curation (supporting), formal analysis (supporting), investigation (supporting), methodology (supporting), project administration (supporting), software (supporting), validation (supporting), visualization (supporting), writing – original draft (supporting), writing – review & editing (supporting).

## Authors

**Felipe Luiz Neves Bezerra de Melo***
Instituto Federal de Educação, Ciência e Tecnologia do Rio Grande do Norte
Av. José Rodrigues de Aquino Filho, n. 640, Alto de Santa Luzia, CEP 59215-000, Nova Cruz, RN, Brazil
felipe.neves@ifrn.edu.br
https://orcid.org/0000-0001-5579-3763

**Ana Maria Jeronimo Soares**
Universidade Federal do Rio Grande do Norte
Campus Universitário, Lagoa Nova, 59078-970, Natal, RN, Brazil
amaria.soa@gmail.com
https://orcid.org/0000-0002-5250-3529

* Corresponding author

Peer review is responsible for acknowledging an article's potential contribution to the frontiers of scholarly knowledge on business or public administration. The authors are the ultimate responsible for the consistency of the theoretical references, the accurate report of empirical data, the personal perspectives, and the use of copyrighted material.
This content was evaluated using the double-blind peer review process. The disclosure of the reviewers' information on the first page is made only after concluding the evaluation process, and with the voluntary consent of the respective reviewers.

# Appendix A

Table 1A

**Model with probit coefficients (referring to Table 3)**

| Variables | (1) Model 1 | (2) Model 2 | (3) Model 3 | (4) Model 4 | (5) Model 5 |
|---|---|---|---|---|---|
| Father | 0.973*** | 0.972*** | 0.972*** | 0.969*** | 0.970*** |
| | (0.0558) | (0.0544) | (0.0543) | (0.0543) | (0.0543) |
| Mother | 0.837*** | 0.841*** | 0.840*** | 0.840*** | 0.840*** |
| | (0.0653) | (0.0640) | (0.0639) | (0.0638) | (0.0638) |
| Sex | 0.155*** | 0.153*** | 0.144*** | 0.147*** | 0.145*** |
| | (0.0472) | (0.0459) | (0.0453) | (0.0452) | (0.0450) |
| Natal | -0.0251 | -0.00717 | -0.00523 | -0.00980 | -0.00800 |
| | (0.102) | (0.0850) | (0.0850) | (0.0850) | (0.0847) |
| Family_income | 0.00995 | 0.0190 | 0.0216 | 0.0217 | 0.0226 |
| | (0.0163) | (0.0160) | (0.0158) | (0.0158) | (0.0158) |
| Nocturnal | -0.0177 | -0.00736 | -0.0152 | -0.00807 | |
| | (0.0547) | (0.0536) | (0.0532) | (0.0529) | |
| Management | 0.110 | 0.0871 | 0.0960 | 0.124 | |
| | (0.139) | (0.140) | (0.140) | (0.138) | |
| N_children | 0.0739 | 0.0739 | 0.0712 | | |
| | (0.0495) | (0.0485) | (0.0486) | | |
| C_income | 0.00566** | 0.00319 | | | |
| | (0.00263) | (0.00232) | | | |
| P_frequency | -0.00590* | | | | |
| | (0.00332) | | | | |
| Constant | -1.360*** | -1.768*** | -1.529*** | -1.523*** | -1.526*** |
| | (0.325) | (0.196) | (0.0942) | (0.0942) | (0.0944) |
| Observations | 10,889 | 10,889 | 10,889 | 10,889 | 10,889 |

**Note**. Standard error in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1. Source: Authors' own elaboration.

# Appendix B — Figures

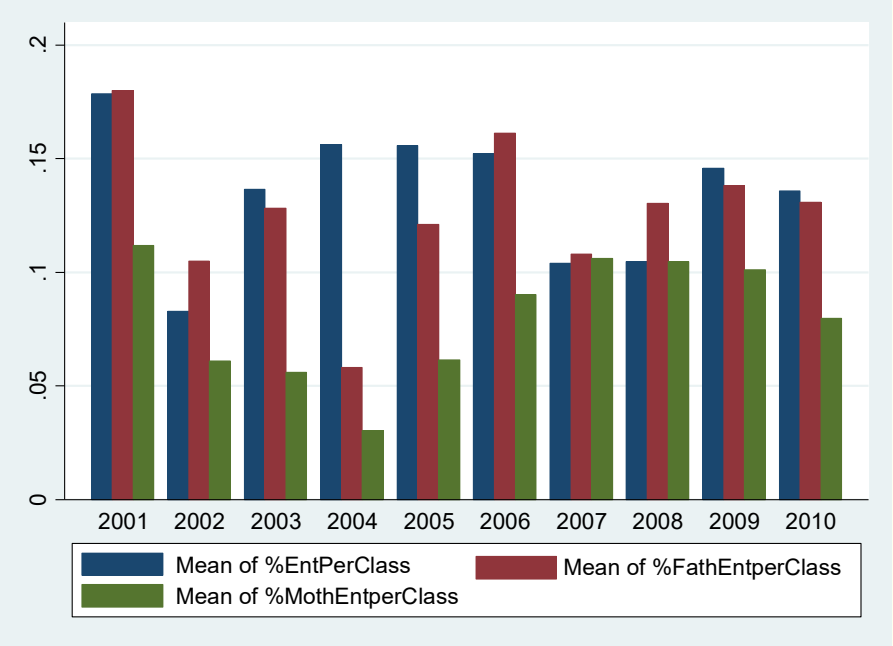


**Figure 1A.** Evolution of the percentage of entrepreneurs by class — 2001 to 2010.

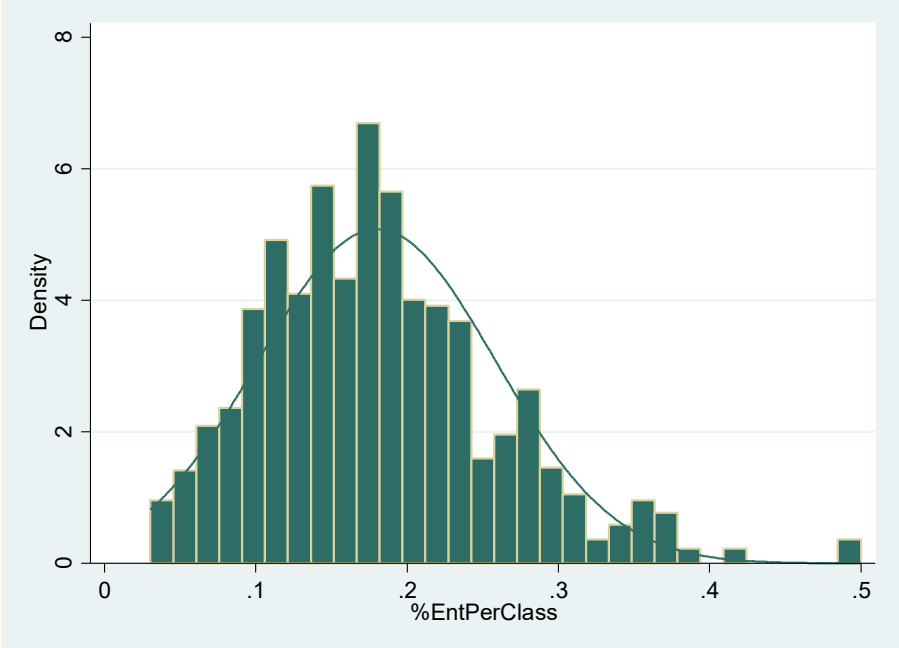


**Figure 2A**. Percentage histogram of entrepreneurs by class.

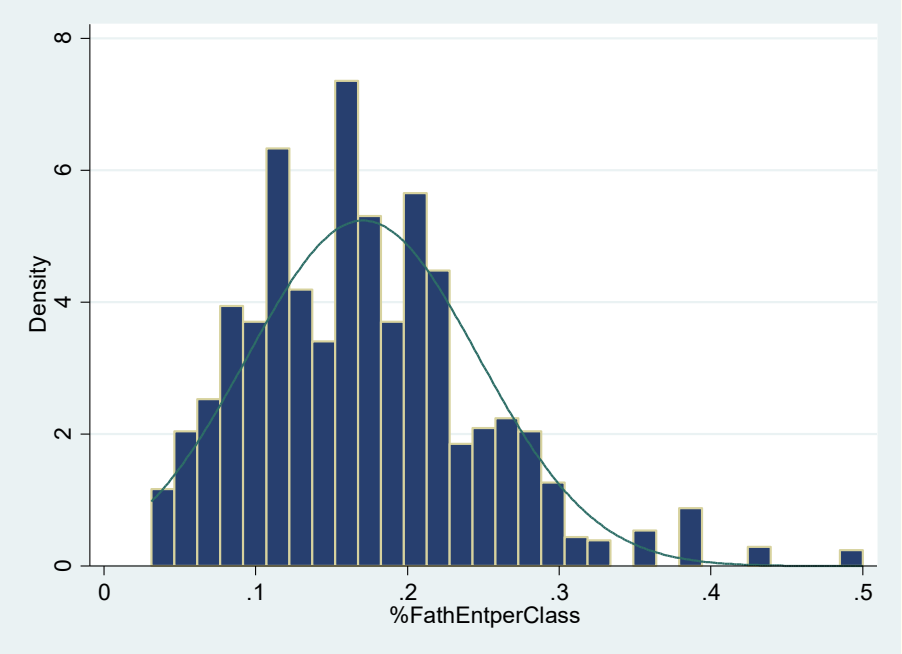


**Figure 3A.** Percentage histogram of parent entrepreneurs by class.

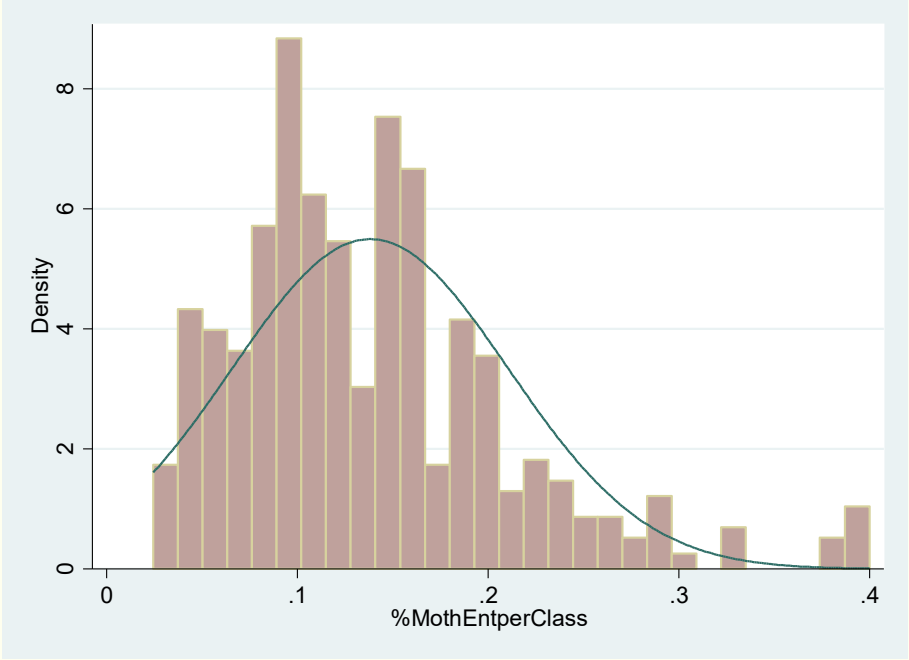


**Figure 4A.** Percentage histogram of entrepreneurial mothers by class.

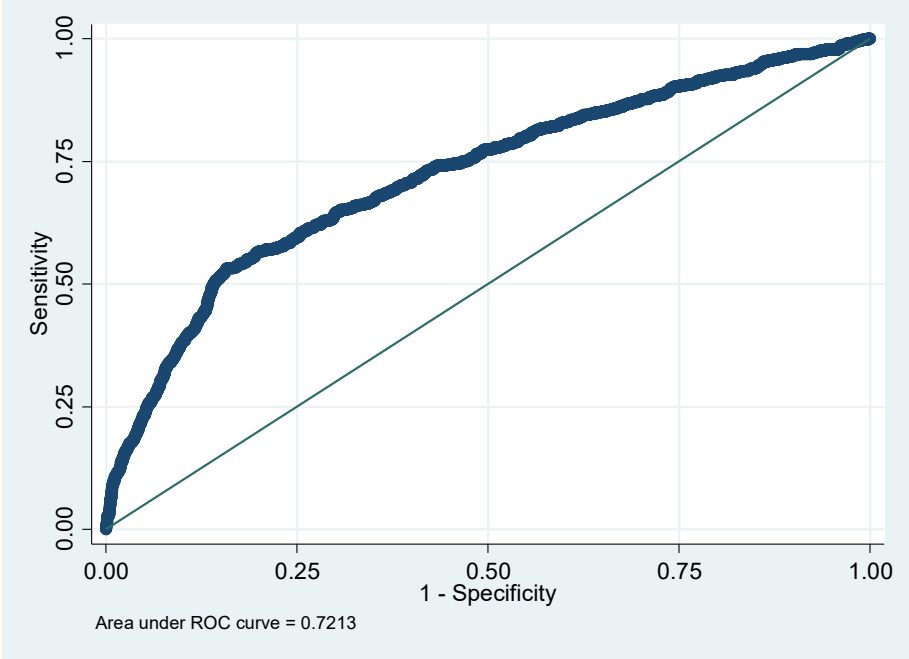


**Figure 5A**. Area graph covered by the ROC curve — Model 1.

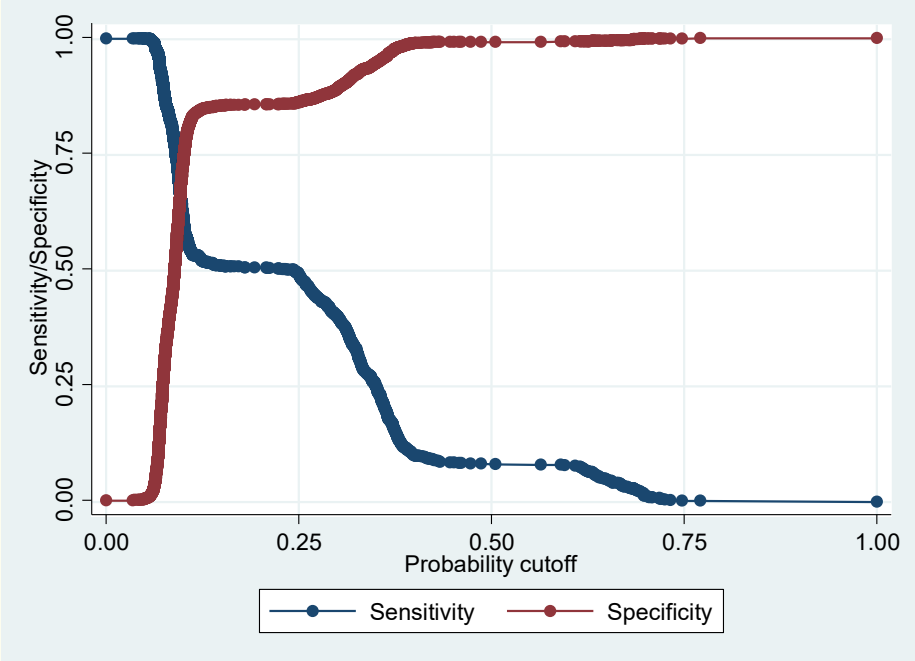


**Figure 6A.** Sensitivity analysis graph versus cutoff point — Model 1.

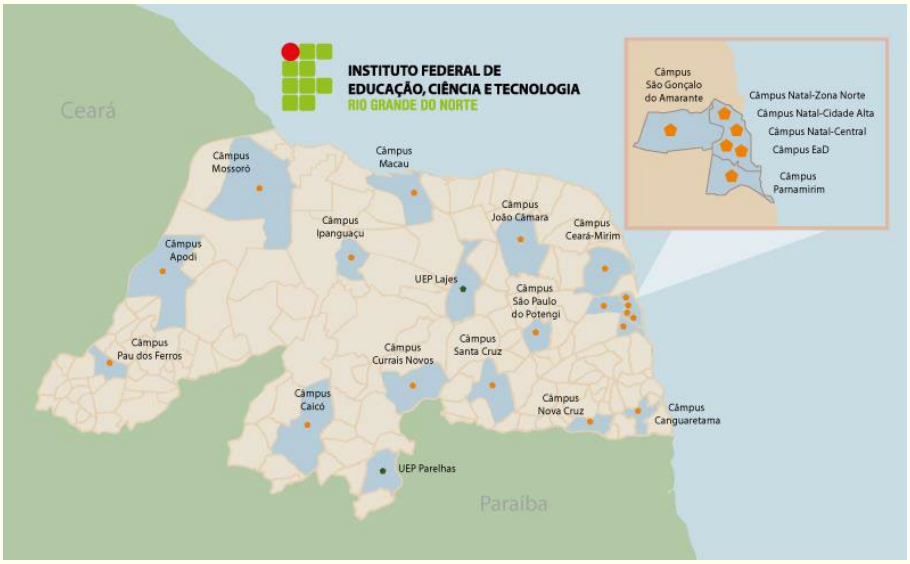


**Figure 7A**. IFRN campuses map in 2019.
Source: IFRN (2018).


**Figure 8A**. Map of the Federal Network of Institutes of Technology.
Source: MEC (2018).