

Theoretical-Empirical Article

Effect of Affirmative Action on Access to Academic Grants in Higher Education

Efeito das Ações Afirmativas no Acesso às Bolsas Acadêmicas no Ensino Superior



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ABSTRACT

Objetivos: access to higher education in Brazil, in the context of affirmative action policies, has been extensively debated, focusing mainly on student admission and trajectory. This study broadens this discussion by exploring affirmative action students' access to academic opportunities during undergraduate studies, analyzing the effects of affirmative action on access to academic grants. **Theoretical approach:** the aim is to analyze how socio-economic characteristics and the mode of admission (open competition or affirmative action) affect students' access to academic opportunities, with an emphasis on academic grants. **Methods:** using microdata from the 2019 National Student Performance Exam (ENADE), we conducted aggregate econometric analyses using Logit and segmented by academic grant category econometric analyses using multinomial Logit. **Results:** the results show an unequal distribution of academic grants in favor of affirmative action students, but influenced by socioeconomic factors. **Conclusions:** the conclusions of this study contribute to the understanding of the effectiveness of affirmative action policies in the context of academic opportunities, providing insights for the development of more inclusive and equitable policies in Brazilian higher education.

Keywords: higher education; affirmative action; academic grants.

RESUMO

Objetivos: tem-se como objetivo analisar como as características socioeconômicas e a modalidade de ingresso (ampla concorrência ou ações afirmativas) afetam o acesso dos estudantes às oportunidades acadêmicas, com ênfase nas bolsas acadêmicas. **Marco teórico:** o acesso à educação superior no Brasil, no contexto das políticas de ações afirmativas, tem sido extensamente debatido, com foco principalmente na admissão e na trajetória dos estudantes. Este estudo amplia essa discussão, explorando o acesso dos cotistas a oportunidades acadêmicas durante a graduação, analisando os efeitos das cotas no acesso a bolsas acadêmicas. **Métodos:** utilizando microdados do Exame Nacional de Desempenho dos Estudantes (Enade) de 2019, conduziram-se análises econométricas agregadas por meio do logit e segmentadas por categoria de bolsa acadêmica, usando o logit multinomial. **Resultados:** os resultados mostram uma distribuição desigual das bolsas acadêmicas a favor dos cotistas, mas influenciada por fatores socioeconômicos. **Conclusões:** as conclusões deste estudo contribuem para a compreensão da eficácia das políticas de ações afirmativas no contexto das oportunidades acadêmicas, fornecendo insights para o desenvolvimento de políticas mais inclusivas e equitativas no ensino superior brasileiro.

Palavras-chave: ensino superior; ações afirmativas; bolsas acadêmicas.

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Cite as: Santos, F. N. F., Soares, L. S. A., & Silva, M. M. C. (2025). Effect of affirmative action on access to academic grants in higher education. *Revista de Administração Contemporânea*, 29(3), e240289. <https://doi.org/10.1590/1982-7849rac2025240289>

JEL Code: I28, J15, C25

Editor-in-chief: Paula Chimentí (Universidade Federal do Rio de Janeiro, COPPEAD, Brazil)

Associate Editor: Carolina Andion (Universidade do Estado de Santa Catarina, Brazil)

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Peer Review Report: The disclosure of the Peer Review Report was not authorized by its reviewers.

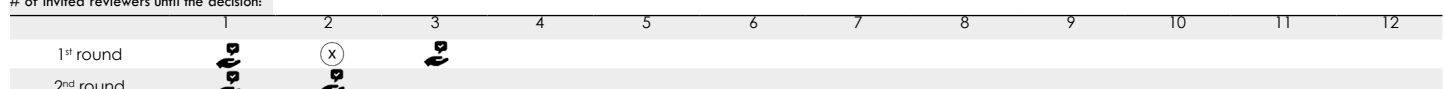
Received: October 11, 2024

Last version received: January 28, 2025

Accepted: March 28, 2025

Published: June 13, 2025

of invited reviewers until the decision:



INTRODUCTION

Access to higher education in Brazil is the subject of debate in various spheres of society, given the potential of increased years of study for the population's human capital and, consequently, for the country's economic development (Neves & Martins, 2016). In this sense, the Affirmative Action Policies created in 2012, known as *cotas*, play an important role in providing opportunities for the country's social minorities, characterized by high educational inequalities. There is an emerging literature on the impact of affirmative action on the country's economic development (Gaspar & Barbosa, 2013). However, the lack of consensus on the policy, which at first is palliative, opens up room for further discussion about its effectiveness (Lima, 2010; Piovesan, 2005; Silva & Silvério, 2003).

Moehlecke (2002) investigated the development of affirmative action in Brazil, highlighting how the country's re-democratization process led social movements to demand a more proactive stance from the government concerning structural issues such as race, gender, and ethnicity. These pressures culminated in the adoption of specific policies, such as affirmative action, to promote inclusion in higher education and combat historical inequalities. Guarnieri and Silva (2017) analyzed the evolution of academic publications on the subject and identified marked trends in different periods. Between 2003 and 2008, the debates were predominantly dichotomous, strongly emphasizing defending or opposing university affirmative action, considering their constitutionality and implementation criteria. The polarization of opinions among various segments of society and the raising of expectations about the potential impacts of affirmative action characterized this period.

Between 2009 and 2013, discussions shifted toward more robust evaluations of the positive effects of affirmative action. The analyses highlighted how the inclusion of historically marginalized groups contributed to fostering greater diversity in higher education institutions. When categorizing the publications, the authors observed that in the first period (P1, N = 48), themes such as 'theoretical and legal clashes' dominated 81.2% (n = 39) of the publications, followed by 'impacts of affirmative action' at 58.3% (n = 28) and 'perspectives' at 50% (n = 24). In the second period (P2, N = 61), discussions on the 'impact of university quotas' were prevalent in 80.3% (n = 49) of the texts, while 'theoretical and legal clashes' decreased to 62.3% (n = 38) and 'perspectives' to 26.2% (n = 16).

This evolution evidences the maturation of discussions on affirmative action in Brazil, transitioning

from initial clashes over its legitimacy to a more analytical assessment of its results, reinforcing the importance of these policies in reducing educational and social inequalities.

Part of this discourse on the effectiveness of affirmative action stems from the fact that they are policies aimed at greater equity of access, as they mitigate the negative effects of gender, ethnicity, income, and disability on entry (Felicetti & Morosini, 2009). For example, Senkevics and Mello (2019) found an increase of 7.8 percentage points (p.p.) in students from public schools accessing federal public institutions between 2012 and 2016. However, given the significant educational deficit in the basic education of minority groups, the implementation of quotas alone is insufficient to ensure equity in higher education among different social groups (Silva et al., 2021). Thus, given that socioeconomic characteristics influence the trajectory of students in higher education (Bourdieu & Passeron, 2014), it is clear that, in addition to the admission policy, the inclusion process for affirmative action students within educational institutions must be implemented.

The literature on this subject has focused more on the disparities in academic performance between affirmative action students and non-affirmative action students, with some results being unfavorable to the latter (Mendes, 2014; Peixoto et al., 2016; Silva et al., 2021; Silva, 2014; Zylberstajn, 2010), favorable (Cavalcanti et al., 2019) or inconclusive (Queiroz et al., 2015). However, the inclusion of minorities in higher education can occur in various ways, as the experience in academia is not limited to aspects directly related to academicism (Almeida et al., 1999; Pachane, 2003; Polydoro et al., 2001). In this sense, the feeling of belonging to the academic environment for affirmative action students could develop through access to extracurricular activities, such as participation in sports, cultural, and leisure activities on the university campus.

With regard to strictly academic trajectories, research and extension activities are particularly relevant. This is because there are international and national studies that analyze the impact of access to these activities on student performance and their subsequent entry into the job market (Bridi, 2004; Massi & Queiroz, 2010). It is also necessary to consider the existence of a significant group of academic activities that require a selection process, which is more common in paid opportunities. This is because accessing activities with some form of grant tends to be challenging due to their competitive nature, necessitating the use of strict selection criteria.

Pinto and Hilu (2005) point out that both in the press and in academic debates, the academic trajectories

of students entering through affirmative action are viewed as deterministic. This perception arises from the oscillation between ‘underperformance’ and ‘overachievement,’ both shaped by preconceived notions about the student’s merit, which deny the potential for success resulting from their entry path. In this context, admission via affirmative action is stigmatized, signaling the possession of less knowledge and fewer qualifications, with repercussions throughout their academic and professional training. Thus, it is important to question whether these selections take into account only the meritocratic component (academic performance, scores in interviews, among others) or whether they consider the student’s background in some way (Bourdieu & Passeron, 2014; Coleman, 1988).

For Bourdieu and Passeron (2014), among all the differentiating factors, social origin undoubtedly exerts the strongest influence on the student environment. From this perspective, given the significance of this area of study, it is essential to discuss the possibility that higher education institutions are perpetuating social inequalities, either through discrimination or the lack of academic inclusion for social minorities. In this sense, it is important to study the inclusion of minority students in academia by examining their opportunities to participate in extracurricular activities, such as scientific initiations (CIs)¹, monitoring/tutoring², extension projects³, and similar endeavors.

Furthermore, most of the studies focusing on academic opportunities during undergraduate studies concentrate on research, especially access to scientific initiation grants. However, according to Canaan (2012), most of these studies are qualitative and only look at CI in public institutions and for specific courses. Furthermore, in terms of methodology, few have used random probabilistic samples, and their samples are made up of voluntary participation, making them of little empirical validity.

It is important to note that, even almost a decade after the publication of Canaan (2012), there are still gaps, as confirmed by Marques and Cunha (2021), regarding the scarcity of research that seeks a quantitative approach based on statistical inference, going beyond basic descriptive statistics with regard to access to scientific initiation, the only ones found being those by Canaan and Nogueira (2015) and the Center for Management and Strategic Studies (CGEE, 2017).

Marques and Cunha (2021) evaluated the impact of access to CI grants on the academic performance of grant students by employing the propensity score matching technique. Overall, the results were robust concerning the pairing method used, allowing for the conclusion that CI grants positively affect grant holders in the Enade⁴

test, with an estimated value between 0.2388 and 0.2476 standard deviations. To assess the robustness of the results, the authors examined the outcomes disaggregated by major area, which also remained robust.

Another way of assessing robustness — which makes the work of Marques and Cunha (2021) especially relevant to the discussion in this study — was to compare access to CI with other academic grants offered during undergraduate studies. Thus, by creating a control group made up of students who received grants for extension projects, monitoring/tutoring, and PET grants, the effects found were reduced in magnitude, although they remained positive and statistically significant. However, in the analysis disaggregated by area, some effects were not significant, indicating that students who took part in CI do not perform worse in the Enade.

In this context, it is clear that, despite the lack of attention in the literature, the evidence associated with studies on academic grants in higher education shows positive results. Furthermore, these studies are focused exclusively on CI, based on information for a specific institution, and in years prior to the implementation of the Affirmative Action Policy. From this perspective, there is a gap in the literature regarding the relationship between academic opportunities, taking into account the diversity between educational institutions, as well as the effects of the implementation of affirmative action policies in 2012.

In light of the above, this study aims to answer the following question: Do students’ socioeconomic characteristics affect the likelihood of accessing academic opportunities within educational institutions? Additionally, as a secondary objective, the study seeks to analyze whether there is any discriminatory effect on the provision of opportunities among students who entered the institution through affirmative action.

In terms of organization, this study is divided into five sections, including this introductory one. The second section addresses the theoretical framework and presents the economic theory of human capital. The third section details the data and the empirical strategy used in the study. The results and discussions are then outlined, followed by the conclusion.

THEORETICAL AND EMPIRICAL BACKGROUND

In an attempt to assess what was ‘human’ about the economy’s growth and productivity, various theories emerged regarding what would be called human capital. Mincer (1958), for example, correlated professional training and personal income with labor productivity and,

consequently, with the country's economic growth. As a result, a debate arose about the factors that enhance the human capacity to produce more qualified jobs. In short, these theories are based on the premise that individuals possess their own capital and establish investment strategies focused on the pursuit of higher incomes (Blaug, 1999).

The theory of human capital spread mainly after the publication of Becker (1993). For Blair (2011), the term capital refers to the skills, knowledge, and resources of the workforce of a given company or population that make them more productive and innovative. In this sense, investment in education becomes a classic example of human capital theory. This is because, by seeking a higher level of education, the individual would be giving up present income to allocate their time to study, aiming to earn higher income in the future.

The issue of unequal opportunities is also discussed by Becker (1993), who analyzes it from an economic perspective. On the supply side, there is an unequal distribution among sectors of society; on the demand side, investment in children's education accounts for the opportunity cost of prolonging schooling. It is important to point out that, despite criticism of the human capital theory, investing in education appears to be an alternative for reducing economic inequalities. Schultz (1973), for example, identified studies that proved a significant association between the level of education and an increase in individual and national income.

The aforementioned studies on human capital and investment in education can be linked to access to academic grants in several ways. Academic grants provide opportunities for students to enhance their skills, acquire additional knowledge, and develop specific competencies in their areas of interest. These experiences and supplementary learning opportunities can contribute to the development of individuals' human capital.

Scientific initiation, for example, is an academic grant that provides students with the opportunity to work on research projects under the guidance of professors and experienced researchers. This experience allows students to deepen their understanding in a specific area, develop research and analytical skills, and gain practical experience in conducting scientific studies. The skills acquired during scientific initiation can enhance students' productivity and qualifications, thereby contributing to their human capital (Massi et al., 2015).

In his study, Canaan (2012) used a logistic probability model to verify the chances of students from the History, Electrical Engineering, and Biology courses at the Federal University of Minas Gerais (UFMG) becoming CI grant holders. The results indicate that socioeconomic

factors differently affect the likelihood of accessing CI across the courses analyzed. For example, gender was only relevant for the History course, as male students were 3.79 times more likely to become grant holders. In terms of color and race, the effects were significant for all three courses but showed different relationships. Thus, while being white increases the chance of receiving a grant in Electrical Engineering by 3.35 times, for the other courses, this chance decreases by 18% for Biology and 64% for History.

Still on the racial issue, Canaan (2012) states that this disparity may be related to the effects of the proliferation of affirmative action policies at the institution. Furthermore, these disparate effects between courses are not random and are in line with the characteristics of the entrants as well as the other opportunities offered in each course. For example, for students in Electrical Engineering, the CI, although it favors the student's academic career, does not benefit them as much in terms of their professional future compared to internships.

CGEE (2017), assessed the impact of participation in Pibic (Institutional Program for Scientific Initiation Grants) on various aspects of students' academic and professional careers, utilizing propensity score matching methods combined with regression techniques. It was found that the chances of Pibic graduates completing a master's degree are 2.2 times higher, while the chances of completing a doctorate are 1.51 times higher compared to those who did not participate in the program. This trend contrasts with the scenario of entering the job market, since the chance of program graduates entering the formal market is 20% lower than that of the control group made up of graduates who chose to work. However, it is important to note that, despite this discrepancy, participants not only experience a short-term impact, but also enjoy, on average, an increase of 5% in their income, controlling for other variables such as age, major field of knowledge, and gender.

Similarly, tutoring and mentoring grants provide students with the opportunity to assist their peers in the learning process, thereby reinforcing their own knowledge and skills. By taking on the roles of tutor or mentor, students develop communication, leadership, and organizational skills, while simultaneously consolidating their understanding in the specific areas in which they work. These additional skills can enhance students' productivity and qualifications, increasing their human capital (Fior, 2017; Frison, 2016; Gonçalves et al., 2021).

The Tutorial Education Program (PET) is another academic grant that seeks to develop specific skills in students. PET groups carry out teaching, research, and extension activities aimed at the academic and professional

improvement of participants. This participation in teaching and extension projects gives students the opportunity to apply their theoretical knowledge in practical contexts, develop teamwork, leadership, and project management skills. These additional skills can strengthen students' human capital and make them more productive and innovative (Caldas et al., 2012; Feitosa & Dias, 2019).

Extension projects can also offer academic grants that allow students to apply their knowledge and skills to community-oriented projects. These projects can address social, environmental, or economic issues, aiming to promote positive change and impact the surrounding reality. By participating in outreach projects, students gain practical experience, develop problem-solving and teamwork skills, and broaden their understanding of the complexities of the real world. These acquired skills can contribute to students' human capital and increase their ability to produce more qualified work (Brêtas & Pereira, 2007; Lins et al., 2014; Moura et al., 2012; Santana et al., 2021).

In summary, access to academic grants, such as scientific initiation, tutoring/mentoring, PET, and extension projects, can provide students with valuable opportunities to develop their human capital. These complementary learning experiences, combined with traditional academic training, can contribute to increasing student productivity, qualifications, and innovation, positively impacting both the individual and the country's economic growth.

METHODOLOGY

In order to estimate the factors that influence the likelihood of higher education students receiving academic grants, the answers to the following question from the Enade questionnaire were used as a proxy for receipt: "Throughout your academic career, have you received any kind of academic grant? If there is more than one option, mark only the grant with the longest duration."

It should be noted that the construction of the question does not allow us to determine with certainty whether the student received only a specific grant, which represents an important limitation of this study, although it does not invalidate it. To devise empirical strategies to address this issue, two econometric methods were employed: logit and multinomial logit.

The first method was chosen due to the possibility of segmenting students into two groups: those who indicated that they had received some type of grant during their academic career and those who had not; while the second method analyzes each of the types of academic grants categorized by Enade separately.

The possibilities categorized are: none; CI; extension; monitoring/tutoring; PET and another type of academic grant.

Initially, the event considered in this analysis will be the receipt of an academic grant. Thus, the probability of this event occurring will be estimated ($\gamma_i = 1$) based on the socioeconomic characteristics of the students, family background, level of effort, type of admission to the institution, and other specific characteristics of the course and/or institution expressed by (x_i).

$$\Pr(\gamma_i=1|x_i) = \frac{\exp[x_i'\beta]}{1+\exp[x_i'\beta]} = \Lambda[x_i'] \quad (1)$$

In Equation (1), the notation $\Lambda[.]$ indicates the cumulative logistic distribution function. The results will be interpreted by the marginal effect on the mean, expressed by the equation:

$$\frac{\partial E(\gamma_i)}{\partial x_k} = \frac{\exp[x_i'\beta]}{[1+\exp[x_i'\beta]]^2} * \beta \quad (2)$$

For the second case, the event considered is receiving one of the academic grants classified by Enade. In this case, as there are more than two possibilities, assuming that it is an event whose possibilities are not ordered and are mutually exclusive, the method indicated is the multinomial logit (Cameron & Trivedi, 2005)¹. In Equation (3), the probability of student i accessing a given academic grant, given by $\gamma(i)$, is expressed as one of the six possibilities of academic grants, indicated by h . Thus, student i 's probability of accessing h is given by p_{ih} .

$$p_{ih} = \Pr(\gamma_i = h) = \frac{\exp(x_i'\beta_h)}{\sum_{j=0}^5 \exp(x_i'\beta_j)}, \text{ onde } 0 < p_{ih} < 1 \quad (3)$$

Also, in Equation (3), there is the row vector x_i' containing the values of the explanatory variables for the i -th student and β_h , the column vectors of parameters for the h categories of academic grants. As $p_{i0} = 1$, a restriction of the type $\beta_j = 0$ is necessary to ensure that the model is identified. Therefore, the alternative 'no grant' is normalized to zero, making it the reference category for interpreting the results. Equation (4) expresses this normalization (Weber & Greene, 2011):

$$p_{ih.} = \Pr(\gamma_i = h) = \frac{\exp(x_i' \beta_h)}{1 + \sum_{j=1}^5 \exp(x_i' \beta_j)} \quad (4)$$

According to [Cameron and Trivedi \(2005\)](#), unlike the results of the logit, those of the multinomial logit are represented in terms of the relative risk ratio (RRR), by means of the exponential of the coefficients $\exp[\hat{\beta}]$. The RRR compares the risks of a given student falling into the grant category compared to the base category, which in the study in question is 'no grant.' Thus, an $RRR > 1$ indicates that a positive variation in the variable analyzed increases the risk of the student acquiring the grant in the category in question compared to receiving no grant.

Database

We used information from the 2019 National Student Performance Exam (Enade) survey, made available by the Anísio Teixeira National Institute for Educational Studies and Research (Inep). This database contains data on the socioeconomic characteristics of the students, the type of admission, and whether the student received any academic

grants during their undergraduate studies, which enables its utilization.

The choice of 2019 for the analysis of this study is justified by the consolidation of the affirmative action policy in Brazilian public higher education, considering that from 2016, with the final phase of implementation of the Affirmative Action Law, at least 50% of the places offered in each course and institution were reserved for students from public schools ([Nogueira et al., 2017](#)). This year marks the period when most students benefiting from affirmative action, who entered after the law was fully implemented, have nearly completed their undergraduate studies. Furthermore, 2019 was the last Enade cycle administered before the COVID-19 pandemic, representing an academic landscape free from the disruptions caused by this event. This makes the data more suitable for assessing the influence of socioeconomic characteristics on access to academic opportunities and potential discriminatory effects within the context of inclusion policies.

Table 1 describes the variables used in this study. Regarding organization, the variables were categorized into groups that reflect the student's socioeconomic status, effort, family background, and controls.

Table 1. Description of the variables used in the econometric model.

Variable	Description
Affirmative action	
shareholder	Binary variable that assumes: 1 if the student entered through the affirmative action; 0 otherwise.
Individual characteristics, income, and family background	
male	Binary variable that assumes: 1 if the student declares himself to be male; 0 otherwise.
white	Binary variable that assumes: 1 if the student declares him/herself to be white; 0 otherwise.
nu_age	Student's age.
single	Binary variable that assumes: 1 if the student is single; 0 otherwise.
alone	Binary variable that assumes: 1 if the student lives alone; 0 otherwise.
income	Dummy variable for the student's total family income. Base category: up to one minimum wage.
Dedication and course characteristics	
purse_per	Binary variable that assumes: 1 if the student receives and/or has already received a permanence grant from the institution (food, housing, permanence, and/or other); 0 otherwise.
t_hours	Dummy variable for hours worked by the student. Base category: not working.
study_hours	Dummy variable that expresses approximately how many hours a week the student devotes to studying, excluding class hours. Base category: none, the student only attends classes.
school_mom	Binary variable that assumes: 1 if the student's mother has completed secondary school; 0 otherwise.
shift	Dummy variable for the student's course shift. Base category: morning.
EF_course	Control variable. Course code.
EF_uf	Control variable. Code of the UF where the course operates.

Note. Own elaboration, based on Inep 2019 data.

RESULTS AND DISCUSSION

Firstly, descriptive statistics were calculated for students based on academic grant category and type of entry, as shown in Table 1. It can be observed that approximately 53.6% of the students benefited from some form of academic grant during their course, with CI being the grant that had the

highest number of participants, totaling 22,907 students, of whom 15,104 (65.9%) were non-affirmative action entrants and 7,803 (34.1%) were affirmative action entrants. This result aligns with existing literature indicating that the Brazilian government's investment in CI grants has increased considerably over the last three decades ([Canaan & Nogueira, 2015](#)).

Table 2. Descriptive statistics of the academic grant categories.

Modality	Wide	%	Shareholder	%	Total	%
PET	1,445	62.3%	874	37.7%	2,319	2.6%
Extension	4,887	60.7%	3,159	39.3%	8,046	9.2%
IC	15,104	65.9%	7,803	34.1%	22,907	26.1%
Monitoring/Tutoring	6,047	65.0%	3,257	35.0%	9,304	10.6%
Other	2,746	60.6%	1,785	39.4%	4,531	5.2%
None	28,158	69.2%	12,546	30.8%	40,704	46.4%
Total	58,387	66.5%	29,424	33.5%	87,811	100.0%

Note. Own elaboration, based on Enade 2019 data provided by Inep.

Table 2 presents the results of the marginal effects from the logit model. Four different specifications were conducted, each incorporating additional controls to assess the robustness of the results related to the variable representing students' entry method. In the first specification (1), the effect of admission via affirmative action on access to any academic grant was estimated. In the second specification (2), controls

related to students' individual characteristics, income, and family background were added. In the third specification (3), variables reflecting the student's time commitment and the characteristics of the course were included. Finally, in the fourth specification (4), the results of which will be discussed below, fixed effects of the course's federative unit were introduced.

Table 3. Results of marginal effects of logit models for access to academic grants.

Variable	(1)	(2)	(3)	(4)
Entry method				
shareholder	0,056*** (0,004)	0,043*** (0,004)	0,013*** (0,004)	0,016*** (0,004)
Individual characteristics, income, and family background				
male		-0,07*** (0.003)	-0,046*** (0.004)	-0,045*** (0.004)
white		-0,001 ^{NS} (0.004)	0,005 ^{NS} (0.004)	-0,002 ^{NS} (0.004)
nu_age		-0,018*** (0.001)	-0,017*** (0.001)	-0,02*** (0.001)
single		0,094*** (0.007)	0,066*** (0.007)	0,057*** (0.007)
alone		-0,017*** (0.005)	-0,025*** (0.005)	-0,015*** (0.006)
ameio_tres		-0,031*** (0.006)	-0,008 ^{NS} (0.005)	-0,004 ^{NS} (0.006)
three_fourths		-0,044*** (0.006)	-0,005 ^{NS} (0.007)	0,001 ^{NS} (0.007)
four_six		-0,054*** (0.007)	-0,006 ^{NS} (0.007)	-0,001 ^{NS} (0.007)
six_ten		-0,057*** (0.006)	-0,004 ^{NS} (0.007)	-0,001 ^{NS} (0.007)
ten_more		-0,076*** (0.007)	-0,022*** (0.007)	-0,024*** (0.008)
school_mom		0,014*** (0.005)	0,011*** (0.005)	0,011*** (0.005)
Dedication and course characteristics				
maintenance_grant			0,114*** (0.005)	0,113*** (0.005)
t_until20h			0,016** (0.009)	0,011 ^{NS} (0.009)
t_21to39h			-0,036*** (0.007)	-0,039*** (0.007)
t_40ormore			-0,068*** (0.006)	-0,068*** (0.006)
study1to3hrs			0,018 ^{NS} (0.011)	0,018 ^{NS} (0.012)
study4to7hrs			0,083*** (0.011)	0,079*** (0.012)
study8to12hrs			0,116*** (0.012)	0,11*** (0.012)
study_more12hrs			0,158*** (0.012)	0,154*** (0.012)
afternoon			-0,098*** (0.019)	-0,064*** (0.02)
integral			0,009 ^{NS} (0.01)	0,008 ^{NS} (0.01)
night			-0,002 ^{NS} (0.013)	0,004 ^{NS} (0.013)
EF_curso	No	No	Yes	Yes
EF_uf	No	No	No	Yes

Note. Own elaboration, based on Enade 2019 data provided by Inep. (1) Standard error in brackets. (2) Asterisks *, **, and *** represent 10%, 5%, and 1% statistical significance, respectively. (3) NS: Not significant.

According to the results for specification (4), it was found that admission via affirmative action has the opposite effect of what was expected, as it increases the probability of access to some type of academic grant in higher education by

1.6 percentage points. Additionally, income and race were not statistically significant, indicating that the reasons for accessing academic grants generally extend beyond socioeconomic factors. However, other student characteristics were correlated with

access to academic opportunities, though the marginal effects were not very significant.

Canaan (2012) mentions that age makes it possible to see whether the student has experienced failures and dropouts during their school career. The results of this study show that the student's age was statistically significant and had a negative effect, indicating that an increase of one year in age reduces the probability of becoming a grant holder by 2 p.p., in line with the findings of Neder (2001) and Canaan (2012). In addition, according to DesJardins et al. (1999), older people tend to find it more difficult to adapt to academic careers because they are more likely to work full time and/or may be married and therefore have other commitments and priorities.

Regarding the variables related to family background, students whose mothers completed at least secondary school are approximately 1.1 percentage points more likely to access an academic grant during their undergraduate studies, which differs from the findings by Canaan (2012) in the Biological Sciences and Electrical Engineering courses.

Regarding the amount of time students work, the variable related to the time spent working showed the expected significant sign, except for those who work less than 20 hours. Thus, students who work between 20 and 40 hours, as well as those who work 40 hours or more, are less likely to have access to

academic grants by four percentage points and seven percentage points, respectively. These results are similar to those found by Canaan (2012) regarding the relationship between access to CI grants and the age of History and Biological Sciences students at UFMG. One explanation for this outcome, aside from that related to student dedication, is that if a student is engaged in any paid activity, he or she may be disqualified from certain academic grant calls, as the term of commitment requires exclusive dedication. Additionally, the value of the grant in 2019 was BRL 400.00, representing around 40% of the minimum wage at that time.

Furthermore, a positive and expected result is noted when analyzing the impact of study hours on access to academic grants, particularly for students who dedicate more than three hours per week to studying. For example, students who commit between four and seven hours experienced an increase of eight percentage points in the probability of accessing academic grants, while those who study between 8 and 12 hours had an increase of eleven percentage points. Finally, students who dedicate more than 12 hours show the greatest increase, with a significant rise of 15.4 percentage points in the probability of accessing academic grants compared to those who dedicate less than one hour to studying.

Table 4. Results of the relative risk ratios (RRR) of the multinomial model of academic grant categories.

Variables	PET	Extension	IC	Monitoring/Tutoring	Other
shareholder	1,2*** (0,06)	1,1 (0,03)***	1,05** (0,02)	1,06* (0,03)	1,05 (0,04)
Individual characteristics, income, and family background					
male	0,74*** (0,04)	0,72*** (0,02)	0,83*** (0,02)	0,99 (0,03)	0,86*** (0,03)
white	0,99 (0,05)	0,94** (0,03)	1,02 (0,02)	1,01 (0,03)	0,9*** (0,03)
nu_age	0,89*** (0,01)	0,96*** (0)	0,89*** (0)	0,91*** (0)	0,99*** (0)
single	1,27** (0,13)	1,32*** (0,07)	1,2*** (0,05)	1,29*** (0,07)	1,31*** (0,08)
alone	0,99 (0,07)	0,95 (0,04)	0,94** (0,03)	0,91** (0,03)	0,93 (0,05)
ameio_tres	1,19** (0,09)	0,99 (0,04)	1,05 (0,03)	0,96 (0,04)	0,77*** (0,04)
three_fourths	1,21** (0,1)	0,96 (0,04)	1,09*** (0,04)	1,03 (0,05)	0,69*** (0,04)
four_six	1,41*** (0,13)	0,94 (0,05)	1,08** (0,04)	1,01 (0,05)	0,67*** (0,04)
six_ten	1,31*** (0,12)	0,91* (0,05)	1,11*** (0,04)	0,95 (0,05)	0,7*** (0,04)
ten_more	1,19* (0,12)	0,76*** (0,04)	1,04 (0,04)	0,78*** (0,04)	0,75*** (0,05)
school_mom	1,12** (0,07)	1,1*** (0,04)	1,03 (0,02)	1,07** (0,04)	1 (0,04)
perma-nence_grant	1,59*** (0,09)	1,79*** (0,06)	1,42*** (0,03)	1,43*** (0,05)	2,27*** (0,09)
Dedication and course characteristics					
t_20h	1,11 (0,12)	0,99 (0,06)	1,06 (0,05)	0,98 (0,06)	1,18** (0,09)
t_21to39h	0,98 (0,08)	0,84*** (0,04)	0,87*** (0,03)	0,77*** (0,04)	0,93 (0,06)
t_40ormore	0,75*** (0,06)	0,72*** (0,04)	0,78*** (0,02)	0,77*** (0,03)	0,76*** (0,04)
study1to3hrs	1,03 (0,17)	1,15 (0,1)	1,08 (0,06)	0,99 (0,08)	1,07 (0,11)
study4to7hrs	1,41** (0,23)	1,36*** (0,12)	1,42*** (0,08)	1,37*** (0,11)	1,17 (0,12)
study8to12hrs	1,84*** (0,3)	1,54*** (0,14)	1,62*** (0,1)	1,54*** (0,13)	1,2* (0,13)
study_more12hrs	2,13*** (0,35)	1,66*** (0,15)	2,01*** (0,12)	1,86*** (0,16)	1,36*** (0,15)
afternoon	0,41** (0,18)	0,75** (0,11)	0,74*** (0,08)	0,93 (0,13)	0,86 (0,16)
integral	1,51*** (0,22)	0,99 (0,07)	0,96 (0,05)	1,08 (0,07)	1,28** (0,13)
night	0,83 (0,17)	1 (0,09)	0,94 (0,06)	1,09 (0,1)	1,35** (0,16)
_cons	0,11** (0,08)	0,1*** (0,04)	5,18*** (1,07)	1,44 (0,42)	0,02*** (0,01)

Note. Own elaboration, based on Enade 2019 data provided by Inep. Note: (1) Standard error in brackets. (2) Asterisks *, **, and *** represent 10%, 5%, and 1% statistical significance, respectively. (3) NS: Not significant.

Table 4, shows the results of the relative risk ratios for each grant category. The analysis shows that all the grant categories analyzed had a positive relationship with admission via affirmative action, with the highest relative risk ratio (RRR) for PET and extension grants.

Contrary to what was observed in the logit model, the race variable was statistically significant in the extension and 'other' grant categories. However, the observed effect was contrary to expectations, as being classified as white reduced the odds of becoming a grant holder in these categories. This result suggests that there is no evidence of racial discrimination in access to academic opportunities, even when the peculiarities of each are taken into account.

Canaan (2012) identified differences in racial effects between courses and indicated that these differences are not random but are related to the characteristics of the students who enter these courses. Based on this perspective, we can consider the possibility that extension projects, being initiatives originating from the demands of the students themselves and managed by them, may be more representative activities and less influenced by racial factors.

However, the situation differs regarding the income variable. In cases like CI and PET, income has proven to be a determining factor in access, with coefficients that gradually increase as students' family income levels rise. For example, in terms of RRR, having a per capita income between six and ten minimum wages increases the chance of being a CI scholar by 10 percentage points compared to not being a scholar for any other type of grant. This may relate to the time dedicated to work. Students with higher family incomes tend to have less need to supplement their finances, which allows them to devote more time to their academic pursuits.

Daflon et al. (2013) highlighted the significant heterogeneity of affirmative action in Brazil, with variations among beneficiaries and insertion mechanisms, demonstrating that different criteria can have varying impacts on the acceptance and outcomes of these policies. Santos (2024) adopted an unconventional approach in the literature by analyzing the different types of quotas instead of grouping them together. According to the author, students in each modality, whether racial, income-based, or both, possess specific characteristics regarding their background. The results identified by the author indicate that the inequality of access to CI was statistically significant only for black quota students and those earning less than 1.5 minimum wages, which corroborates the findings of this article.

FINAL CONSIDERATIONS

This study aimed to analyze whether socioeconomic characteristics and the type of university access (broad competition or affirmative action) affect students' access to academic opportunities. To achieve this, the Enade microdata for 2019, made available by Inep, was used. The results obtained in this study revealed unequal access to academic grants among students, with significant differences based on socioeconomic characteristics and mode of entry.

A limitation of this study is the question in the questionnaire used to create the variable of interest, which limits the analysis to the longest grant in cases where the student received more than one grant. In addition, the grouping of affirmative actions into broad categories, as done in this study, may limit the understanding of their impacts. Future work could address this gap by considering the specificities of the different modalities, contributing to a more precise analysis of the dynamics of academic inclusion.

However, despite the aforementioned limitations, the results of this study provide important input for educational managers and public policymakers in Brazil. The identification that socioeconomic characteristics significantly influence access to academic grants points to the need for affirmative policies that go beyond university admissions. It is essential to implement specific strategies to ensure equity in the distribution of grants, such as criteria that consider socioeconomic vulnerabilities and promote greater inclusion of historically marginalized groups. Additionally, the results can guide the enhancement of student retention programs, such as increasing grant amounts and creating mechanisms that lessen reliance on solely merit-based criteria. These actions would not only improve the effectiveness of affirmative policies but also reinforce the role of higher education in fostering social mobility and addressing the country's structural inequalities.

Furthermore, we suggest that future studies analyze the effects of increasing the value of grants (as in the case of scientific initiation and monitoring), since such an increase could alter the demand for grants, which would imply greater chances of discrimination among students in situations of socioeconomic vulnerability. Finally, it is worth questioning the implementation of specific affirmative action for access to these grants, as socioeconomic conditions have been shown to determine access, regardless of the type of grant being analyzed.

NOTES

1. Undergraduate research program in Brazil that introduces students to academic research, often as part of scholarships or institutional projects.
2. Program where undergraduate students assist professors in teaching activities, helping peers with course content and reinforcing their own learning.
3. University programs connecting academic knowledge with community needs through social, cultural, or educational activities
4. Brazilian exam assessing undergraduate students' knowledge and skills; mandatory for selected students and part of the national higher education evaluation system

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Fast-track

An initial version of this manuscript was presented at the 48th ANPAD Meeting - EnANPAD 2024, under the title “Efeito das ações afirmativas no acesso às bolsas acadêmicas no ensino superior” (APB12801). It was awarded as the best work in Public Administration, as well as being indicated by the event for fast-track submission at RAC.

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1st author: project administration (lead), formal analysis (lead), conceptualization (lead), data curation (lead), methodology (lead), writing-original draft (lead), writing - review & editing (lead), visualization (lead).

2nd author: conceptualization (support), writing - original draft (support), writing - review & editing (equal), visualization (support).

3rd author: conceptualization (support), writing - original draft (support), writing - review and editing (support), visualization (support).

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Conflict of Interests

The authors informed that there is no conflict of interests.

Funding

The authors reported that there was no funding for the research in this article.

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