

# RELAÇÃO ENTRE ORIGEM SOCIAL E DESEMPENHO ACADÊMICO NA EDUCAÇÃO SUPERIOR NO BRASIL ENTRE OS ANOS DE 2008 E 2013

## RELATIONSHIP BETWEEN SOCIAL ORIGIN AND ACADEMIC PERFORMANCE IN BRAZILIAN HIGHER EDUCATION BETWEEN THE YEARS 2008-2013

### RELACIÓN ENTRE ORIGEN SOCIAL Y DESEMPEÑO ACADÉMICO EN EDUCACIÓN SUPERIOR EN BRASIL ENTRE 2008 Y 2013

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#### RESUMO

Este artigo analisa a influência de variáveis individuais, socioeconômicas e institucionais sobre o desempenho de uma amostra de 513.164 estudantes do ensino superior no Brasil que realizaram o Exame Nacional de Desempenho de Estudantes (ENADE) entre os anos de 2008 e 2013. Os dados foram analisados por meio de regressão hierárquica. Os resultados apontam diferenças entre estudantes de instituições pública e privada e para uma relação significativa entre desempenho e os fatores socioeconômicos (medidos pelo capital cultural e econômico), o nível de escolaridade da mãe e o tipo de escola secundária frequentada. Número de doutores e percepção de melhor qualidade do projeto pedagógico influenciaram positivamente o desempenho dos alunos. Os achados reforçam a tese da reprodução social já identificada para os níveis de ensino básico e secundário no Brasil e sugerem a necessidade de repensar políticas públicas que corrijam as diferenças de origem social dos indivíduos mesmo no ensino superior.

**Palavras-chave:** Capital cultural; Origem social; Desempenho de estudantes; Educação superior; Reprodução social.

#### RESUMEN

Este trabajo analiza la influencia de variables individuales, socioeconómicas e institucionales sobre el desempeño de una muestra de 513.164 estudiantes de nivel superior en Brasil que realizaron el Examen Nacional de Desempeño de Estudiantes (ENADE) entre los años de 2008 y 2013. Los datos fueron analizados por medio de una regresión Jerárquica. Los resultados apuntan diferencias entre estudiantes de instituciones públicas y privadas y para una relación significativa entre el desempeño y los factores socioeconómicos (medidos por el capital cultural y económico), el nivel de escolaridad de la madre y el tipo de escuela secundaria frequentada. Número de doctores y percepción de mejor calidad del proyecto pedagógico influenciaron positivamente el desempeño de los alumnos. Los resultados refuerzan la tesis de la reproducción social identificada para los niveles de enseñanza básica y media en Brasil y sugieren la necesidad de repensar políticas públicas que corrijan las diferencias de origen social de los individuos en la enseñanza universitaria.

**Palabras clave:** Capital cultural; Origen social; Desempenho de estudantes; Educación superior; Reproducción social.



## ABSTRACT

This paper analyses the influence of individual, socioeconomic and institutional variables on the performance of a sample of 513,164 higher education (HE) students in Brazil who completed the National Student Performance Examination (ENADE) between the years 2008 and 2013. The data, broken down by public and private HE centres, were analysed using hierarchical regression. The results point to differences between students in public and private HE centres and to a significant relationship between grades and socioeconomic factors (as measured by cultural and economic capital), mother's education level and the type of secondary school attended. More instructors with PhDs and better quality pedagogical aspects positively influenced student performance. The findings reinforce the thesis of social reproduction already identified for basic and secondary levels of education in Brazil and suggest the need to rethink public policies that correct the differences of social origin of individuals even in higher education.

**Keywords:** Cultural capital; Social origin; Student performance; Higher education; Social reproduction.

## 1 INTRODUCTION

One factor that explains student performance is social origin, associated with the possession of cultural, social and economic capital (Bourdieu, 1986; Coleman, 1988). According to Bourdieu (1986), irrespective of personal and individual efforts invested in achieving success, certain factors outside the direct control of students affect their academic performance, some of which are related to social origin (BOURDIEU, 1986; COLEMAN, 1988; DIMAGGIO, 1982; FINNIE, 2012; BAHNA, 2017). Several studies — including those by Laros, Marciano and Andrade (2012), Chiu (2007), Finnie (2012) and Tomul and Çelik (2009) — confirm this relationship between the social origin of students and their performance at different education levels. Other areas of the trajectory of individuals have been analysed in light of their cultural capital; Turley, Santos and Ceja (2007), for instance, analysed the impact of social origin on expectations regarding opportunities to enter higher education (HE), while Friedman, Laurison and Miles (2015) identified differences — in cultural capital, income and capital accumulation — between socially mobile individuals in similar positions according to whether they were from less or more privileged classes.

Research has also been conducted in relation to higher education (HE) and the concept of capital, especially cultural capital (ROWLANDS, 2013; CALARCO, 2014; CINCINNATO et al., 2016; BAHNA, 2017; GALE; PARKER, 2017). Few Brazilian studies of student performance and socioeconomic variables have focused on individuals and their families, however. Such research is relevant because HE should increase an individual's chances of success in the labour market, most especially for individuals from lower socioeconomic classes whose expectations regarding upward social mobility are typically anchored to HE.

Starting in the 1990s, the number of HE centres in Brazil started to increase, going from 893 in 1993 to 2,391 in 2013 (301 public and 2,090 private) (INEP, 2017). In terms of enrolment in undergraduate courses, the number of students increased from 1,594,668 in 1993 to 7,305,977 in 2013, (1,932,527 public and 5,373,450 private) (INEP, 2017).

Public HE centres in Brazil, which are free to all, are managed by federal, state and municipal authorities. Private institutions, which may be nonprofit or profitmaking, are managed by individuals or legal entities, without any interference by the public authorities, except in relation to penalties if they fail to meet established quality levels.

In 2013, 26.4% of students were enrolled in public HE centres while 73.5% were enrolled in private HE centres. These data are fairly similar to those for 2008 (22.6% public and 77.4% private). The small increase for the public HE centres is due to government programmes, launched in 2003, to increase the number of students in HE. Of the total HE student population in 2013, 44.47% were men and 55.53% were women.

In terms of income, between 2008 and 2013 there was a reduction in participation in public and private HE centres by students from the wealthiest 20% of the population. In 2008, this segment accounted for 48.5% and 56.7% of students in public and private HE centres, respectively, dropping to 39.1% and 42.8%, respectively, in 2013. Students from the poorest 20% of the population accounted for only 2.9% and 1.0% of students in public and private HE centres, respectively, in 2008, rising to 5.9% and 2.7%, respectively, in 2013 (IBGE, 2017). These changes partially reflect government HE access policies to encourage HE participation by poorer population segments, in both public centres (through minimum quotas for specific disadvantaged groups) and private centres (through funding programmes).

In 2013, 55% of students in the 18-24 age bracket attended HE, compared to 45.5% of these students were in the recommended education level for their age group. The adequacy of age in relation to course is still uneven, especially among specific ethnic groups. In the 18-24 age bracket, in 2013, 69.4% of white people attended HE, compared to 60.4% in 2008; the corresponding figures for non-white people were 40.7% and 28.6%, respectively. The relatively greater increase for non-whites (around 42%) compared to whites (around 15%) is explained by public policies for HE access that had a greater impact on the former.

The aim of this study was, using hierarchical regression, to analyse the influence of social origin on Brazilian student performance in HE — as measured by grades obtained in the National Student Performance Examination (ENADE) — between 2008 and 2013. Also explored were differences in grades depending on the kind of HE centre attended and the municipality where the HE centre is located. The article begins with a discussion of Bourdieu's theoretical concepts of cultural and economic capital, then describes the data and the hierarchical regression methodology used and concludes with a discussion and final considerations.

## **2 THEORETICAL BACKGROUND**

Bourdieu's sociology relies heavily on the concepts of capital, habitus, and field. These three concepts are integrated and serve to understand the actions of subjects in society. Despite this connection between these concepts, it is possible to use the concept of capital to understand the process of social reproduction present in societies. And it is in this sense that in this study, the concept of capital is used. Similar studies in different contexts have used the concept of capital to explain different phenomena such as the studies of DiMaggio (1982), Finnie (2012), Møllegaard and Jaeger (2015), Mirador (2014), Kalfa and Taksa (2015) and Jæger and Møllegaard (2017).

Bourdieu amplified the concept of capital by highlighting the existence of other forms of capital besides economic capital (BOURDIEU, 1986). Cultural capital, it is suggested, would explain the difference in academic performance by students from different social classes (COLEMAN, 1988; BOURDIEU, 1986). Capital thus has a dual function in that it defines probabilities of success and also the position of an agent in their field (THOMPSON, 2003; ARCHER ET AL., 2015). This is the sense in which Bourdieu and Wacquant (1992) consider that understanding capital can explain the dynamics of societies, including inequalities.

Economic capital — the most commonly understood capital — is represented as material goods and property. Coleman (1988) refers to financial capital, which includes machines, productive and tangible instruments and equipment, while Bonnewitz (2002) includes money, assets and land in this kind of capital. For Bourdieu (1986), the most important characteristic of economic capital is that it can immediately be converted into money and can be institutionalised in the form of property rights. The possession of economic capital, for instance, enables students to access or acquire resources such as a suitable place to study, textbooks and teaching and other materials that facilitate learning (COLEMAN, 1988). Included is the income of the student's family, as this facilitates access to — and smooths the way to acquiring — cultural capital (FRIEDMAN et al., 2015; BAHNA, 2017).

Cultural capital, less tangible than economic capital and incorporated in the individual, comprises the set of intellectual qualifications transmitted mainly by the family and the education system (BOURDIEU, 1986). In Thiry-Cherques' (2006) view, cultural capital includes knowledge, skills and information as appropriated by the agent. According to Klimczuk (2015, p. 1), cultural capital is 'social characteristics that provide the individual with the possibility of changing his/her hierarchical position in the system, such as wealth, power, prestige, education and health.' For this author, cultural capital therefore encapsulates social origin, education, taste, lifestyle, speech and dress. Coleman (1988) considers cultural capital to include any skills and capabilities that enable the individual to act in new ways.

Cultural capital largely explains unequal educational attainment by children from different classes and class fractions (BOURDIEU, 1986; DIMAGGIO, 1982); it therefore also explains how social classes are reproduced. Children born into more privileged families tend to be more successful at school and in their careers than their underprivileged peers (JOHANSSON; HÖJER, 2012; KALFA; TAKSA, 2015; BAHNA, 2017; FRIEDMAN ET AL., 2015). Cultural capital is sometimes more significant in explaining academic performance and social reproduction than economic and social capitals (BOURDIEU, 2003; FINNIE, 2012; MØLLEGAARD; JÆGER, 2015).

Cultural capital exists in three distinct forms, namely, embodied, objectified and institutionalised cultural capitals. Embodied cultural capital — which encompasses lasting dispositions of mind and body, linguistic competence, manners, customs and cultural knowledge — enables individuals to understand the practices of the group to which they belong. This kind of capital, which develops passively over time, is transmitted from parents to children and is augmented through investments made to speed up and add momentum to this transmission (ANDERSEN; JÆGER, 2015). For Bourdieu (1986), this type of capital cannot be transferred without involving the individual; furthermore, it is governed by the 'arrow effect', which reflects the fact that any increase in the number of instruments for inculcating this capital facilitates its acquisition. Thus, for instance, the more resources a school has — in terms of well trained teachers, laboratories, libraries, etc — the better and the sooner its students acquire cultural capital. A study by Tavakoli, Pahlvannezhad and Ghonsooly (2017) exemplifies this notion: English teachers with more cultural capital were found to be more effective in promoting learning in their students.

Objectified cultural capital refers to the possession of cultural goods in material form, such as paintings, books, dictionaries, instruments, machines, etc (BOURDIEU, 1986). Their possession depends on the economic capital acquired or inherited by the agent. Possession, however, does not guarantee consumption, which will

depend on the person's embodied capital, necessary to be able to decipher the meaning of the objectified cultural good.

Institutionalised cultural capital refers to academic or professional credentials that formally recognise and legitimise a person's cultural capital (BOURDIEU, 1986). As happens with objectified cultural capital, however, actual possession of cultural capital credentials may not be sufficient to guarantee advantages within a field or to ensure upward social mobility; here again, embodied capital plays a role (BOURDIEU, 1986; KLIMCZUK, 2015). Moreover, the prestige of the institution that issues the credential also affects how its meaning is deciphered (BÖRJESSON et al., 2016).

The education system plays a role in the provision of cultural capital when families do not have cultural capital to transmit to their children (BOURDIEU; PASSERON, 1970, 1979). However, according to Bourdieu (1977, p. 494), the education system tends to reinforce differences between individuals rather than equalise chances of success. It is in this sense that DiMaggio (1982, p. 200) affirms that schools reward students on the basis of cultural capital, defined — by Bourdieu (1977) — as 'instruments for the appropriation of symbolic wealth socially designated as worthy of being sought and possessed.' Thus, individuals who already possess large amounts of cultural capital perform better and are rewarded more by the education system. A cycle of reinforcement therefore results in which education is the main driving force (THOMPSON, 2003; JÆGER; MØLLEGAARD, 2017; GALE; PARKER, 2017; JOHANSSON; HÖJER, 2012). More importantly, since educational institutions — up to and including HE centres — are often unable to create instruments that minimise differences in social origin (O'SHEA 2016), they play a central role in reproducing cultural capital across generations (BÖRJESSON et al., 2016).

The ENADE is one of the components of the National System for Evaluation of Higher Education (SINAES), implemented since 2004. Its objectives are to evaluate student performance according to National Curricular Guidelines for undergraduate courses, to develop the skills and abilities necessary for particular professions and to assess student knowledge regarding both current Brazilian and worldwide issues (INEP, 2017). The ENADE is a compulsory component in undergraduate courses and compliance is recorded in the student's academic history. It is also a condition for the issuance of diplomas by HE centres. The ENADE is taken by those students who expect to completion of the course in the year of ENADE, as well as those who have completed more than 80% (eighty percent) of the minimum workload of the course curriculum of the HE centres. (INEP, 2017).

The ENADE consists of 40 discursive and multiple choice questions, 10 on general knowledge (common to all courses) and 30 on material specific to the specialism (INEP, 2017). The maximum score is 100 points, with 25% corresponding to the general knowledge questions and 75% corresponding to the specialist questions.

FIRJAN<sup>1</sup> is a private nonprofit association of some 7,500 companies whose mission is to promote competitiveness, education and quality of life for workers and society in general. The FIRJAN Municipal Development Index (IFDM) monitors annual socioeconomic development in some 5,000 Brazilian municipalities in three areas of activity: employment and income, education, and health (FIRJAN, 2016). In addition, a general IFDM indicator reflects scores for all three areas combined. The three dimensions measure variables as follows:

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1 Federation of Industries of the state of Rio de Janeiro.

**Employment and income:** formal employment generation, absorption of local labour, generation of income from formal employment, average wages from formal employment, and inequality.

**Education:** enrolment rate in early childhood education, dropout rate, age-series distortion rate, percentage of teachers with HE, average daily class hours, and the Basic Education Development Index (IDEB) score.

**Health:** number of prenatal consultations, deaths from ill-defined causes, preventable infant deaths, and hospital admissions due to care-sensitive conditions.

The dimensions are scored between 0 and 1, with municipal development classified in one of four categories as follows: low (0-0.4); fair (0.4-0.6); moderate (0.6-0.8); and high (0.8-1.0) (FIRJAN 2016). The indexes are built exclusively from official data published by the Ministries of Health, Education and Labour.

### 3 MATERIALS AND METHODS

Data for six timepoints representing the years 2008-2013 — sourced from the Brazilian National Institute of Studies and Research (INEP) — were used to analyse the determinants of ENADE grades obtained by Brazilian HE students. These data were used in a hierarchical regression model with three levels: student, HE centre, and municipality. The sample contained 513,164 observations from the population of 2.021.388 individuals who performed the ENADE between the years 2008 and 2013: 308,567 and 132,597 observations referring to students attending private and public HE centres, respectively. The years 2008 to 2013 were chosen because, in this period, the fact that two years for each area were evaluated for the ENADE meant that it was possible to obtain data for all courses being offered in Brazil in that period. Furthermore, FIRJAN income, employment and health variables for municipalities were only available up to 2013.

To be able to account for the impact of local variables on student grades, these were nested by university campus, i.e., if a HE centre had a campus in five different municipalities, then this was counted as five HE centres. Table 1 describes the variables used for the model.

Table 1 - Description of the model variables

Variable	Description	Definition
<b>Dependent variable (sourced from INEP)</b>		
N_ENADE	ENADE grade	Grade received in the ENADE exam
<b>Explanatory variables of interest: municipal (sourced from FIRJAN)</b>		
FIRJ_employment(+)	FIRJAN employment and income index	Index that reflects transformations in Brazilian municipalities based on employment and income evaluations
FIRJ_health(+)	FIRJAN health index	Index that reflects transformations in Brazilian municipalities based on health evaluations
LN_ENEM(+)	ENEM grade for the municipality	Average National Secondary Education Examination (ENEM) grade for each municipality (proxy for local education)
<b>Explanatory variables of interest: HE centre (sourced from INEP)</b>		
N_infra(+)	Infrastructure grade	Grade reflecting quality of physical installations as assessed in a socioeconomic survey of students
N_pedag(+)	Pedagogical grade	Grade reflecting quality of pedagogical organisation as assessed in a socioeconomic

		survey of students
N_doctor (+)	Percentage of doctors	Grade reflecting number of instructors with a PhD
N_master(+)	Percentage of masters	Grade reflecting number of instructors with a master's degree
N_contract (+)	Percentage of full- or part-time instructors	Grade reflecting number of instructors with full-time or part-time employment contracts
<b>Explanatory variables of interest: individual (sourced from INEP)</b>		
Age	Age of student	In years
Sex	Sex of student	1 = man; 0 = woman
Race	Race of student	1 = Caucasian; 0 = other
Employment	Indicator of whether the student is employed	1 = does not work; 0 = other situations
Funding	Indicator of whether the student receives funding	1 = yes; 0 = no
Secondary education	Indicates type of secondary education	1 = all public
Family income	Family income bracket, times the minimum wage	1 = up to 1.5 times 2 = 1.5-4.5 times 3 = 4.5-10 times 4 = over 10 times
Mother's education	Education level of the student's mother	1 = no schooling 2 = basic education 1 <sup>st</sup> -5 <sup>th</sup> year 3 = basic education 6 <sup>th</sup> -9 <sup>th</sup> year 4 = secondary 5 = third-level 6 = post-graduate

Note: Authors' elaboration.

Taking into account the student's municipality aims to determine whether a student's grade is influenced by the socioeconomic context of their municipality. The aim was to disentangle this possible influence from both individual characteristics and the characteristics of the HE centre, bearing in mind that students within a specific group or context (in this case, HE centre or municipality) are likely to be similar. Disregarding this fact would result in inadequate variance and standard error. Multilevel models have the advantage of permitting the effects of higher-level variables to be explored while simultaneously allowing the dependent variable to be influenced by individual factors (GOLDSTEIN, 2003).

Described is a model with three levels: individual and HE centre levels, embedded, in turn, in a municipality level. Thus, the simplest model is of the type:

$$y_{jkl} = \beta_0 + f_l + v_{kl} + u_{jkl}$$

so that:

$$f_l \sim N(0, \sigma_f^2)$$

$$v_{kl} \sim N(0, \sigma_v^2)$$

$$u_{jkl} \sim N(0, \sigma_u^2)$$

and where  $y_{jkl}$  represents the ENADE grade of student  $j$  studying at HE centre  $k$  in municipality  $l$  and  $\beta_0$  is the average response for all municipalities. Since there are no explanatory variables, we have an analysis of variance (ANOVA) model in which:

$f_l$  is the effect of the municipality  $l$

$v_{kl}$  is the effect of HE centre  $k$  within municipality  $l$

$u_{jkl}$  is the error term.

This model allows variance to be decomposed before controlling for explanatory variables. The next step is to include controls associated with the different levels. Suppose, by hypothesis, that the random intercept model includes an explanatory variable at each level. In this case, the model is as follows:

$$y_{jkl} = \beta_0 + \beta_1 x_{1jkl} + \beta_2 x_{2kl} + \beta_3 x_{3l} + f_l + v_{kl} + u_{jkl}$$

so that:

$$f_l \sim N(0, \sigma_f^2)$$

$$v_{kl} \sim N(0, \sigma_v^2)$$

$$u_{jkl} \sim N(0, \sigma_u^2)$$

and where, in the fixed part of the model, the variable  $x_{3l}$  is the only variable related to the municipalities, with a slope coefficient of  $\beta_3$ . In the same way,  $x_{2kl}$  is a control variable for the HE centre, whose slope coefficient is  $\beta_2$ . Recall that the sample was divided between public and private HE centres in order to be able to compare results.

## 6 RESULTS AND DISCUSSION

The aim was to investigate the influence of economic and cultural capitals on ENADE grade for 513,164 students at public and private HE centres between 2008 and 2013. The individual characteristics of the students were controlled for the characteristics of the HE centre and the municipality where the HE centre is located. The main results are summarised in Table 2.

Table 2 - Analysis of variance (ANOVA) and hierarchical linear model (HLM) regression results

Dependent variable: ENADE grade	ANOVA	HLM	ANOVA	HLM
	Public HE		Private HE	
Constant	42.6***	30.25***	38.76***	-43.8***
Year_2009		3.04***		1.07***
Year_2010		3.45***		0.17
Year_2011		2.78***		2.74***
Year_2012		-0.80***		-1.45***
Year_2013		8.57***		4.43***
Mother's education_2		1.81***		1.64***
Mother's education_3		1.95***		2.05***
Mother's education_4		2.22***		2.50***
Mother's education_5		2.61***		3.21***
Mother's education_6		3.63***		4.02***
Family income_2		0.98***		1.38***
Family income_3		2.81***		3.20***
Family income_4		4.30***		5.05***
Funding		-0.03		3.21***
Employment		0.92***		1.11***
Race		-1.41***		-0.73***
Sex		-1.26***		-1.37***
Age		0.78***		0.93***
Age <sup>2</sup>		-0.01***		-0.01***
Secondary education		-0.35***		-0.12**



N_infra		-0.15***		-0.04
N_pedag		0.55***		0.76***
N_master		-0.04		0.17***
N_doctor		0.81***		0.45***
N_contract		0.06		-0.004
FIRJ_employment		2.57***		0.53
FIRJ_health		3.45***		1.99**
Ln_ENEM		-1.81		8.86***
Constant variable (municipality)	10.01***	1.76***	1.46***	0.75***
Constant variable (HE centre)	28.25***	24.4***	18.27***	16.45***
Residual variable	215***	207***	197***	194***
LR test	15270***	7243***	22777***	11976***
Obs				

Note: Authors' elaboration.

The ANOVA model indicates that the average grade for students from public HE centres was higher than for students from private HE centres (42.6 vs 38.7). Of the unexplained variance in grades, almost 85% originated at the individual level for students from public centres, compared to 91% for students from private centres. The lowest portion of unexplained variance in grades arose at the municipal level: 0.7% for private centres and 4% for public centres. Finally, 11% of the unexplained variance in grades originated in public HE centres and 8.3% in private HE centres. Note that ENADE grades for students from both public and private HE centres were lower in 2012 than in 2008 and also that age, up to a certain point, had a positive effect on grades.

The mother's education variable — which reflects the cultural capital accumulated by the family and transmitted to the individual — affected student performance in a positive way; furthermore, performance was also increasingly better for higher levels of education of the mother. The example of a mother, along with her knowledge, experience of education and support for study tends to create an environment conducive to learning (O'SHEA, 2016; FINNIE, 2012; JOHANSSON; HÖGER, 2012). The mother is significant also in that she plays a more fundamental role than the father, since, as a general rule, she spends more time with her children (DIMAGGIO, 1982; COLEMAN, 1988; BOURDIEU, 1986).

The kind of secondary school attended by the student is another aspect reflecting cultural capital. It was observed that individuals who attended public secondary schools performed worse in public ( $\beta = -0.35$ ) than in private ( $\beta = -0.12$ ) HE centres. This difference between public and private HE students may be due to the fact that some students accessed public HE through affirmative policies, and so required lower grades in the selection process than students from private secondary schools, who obtained their place through an open competition.

Since public secondary schools in Brazil have been reported to perform worse than private secondary schools (INEP, 2017), this would suggest that they transmit less cultural capital to their students. This, in turn, is reflected in poorer HE grades and lower probabilities of academic success — a cycle that reinforces the thesis of social reproduction (BOURDIEU; PASSERON, 1970; BONNEVITZ, 2002; BÖRJESSON et al., 2016; O'SHEA, 2016; TURLAY; SANTOS; CEJA, 2007). Private secondary schools, in contrast, reinforce the arrow effect (BOURDIEU, 1986) in the transmission of cultural capital by offering better learning conditions. Private-school students thus enter HE with more cultural capital and so have more guarantees of success (MIRADOR, 2014; FINNIE, 2012).

In relation to race and sex, in both private and public HE centres, black people and women obtained lower grades, probably because of historical social conditions for these two groups. DiMaggio (1982) and, more

recently, Laros, Marciano and Andrade (2012) and Artes and Ricoldi (2015) have reported significant differences in the academic performance of these two groups. In the case of black people in Brazil, this disadvantage is acknowledged and reflected in affirmative policies regarding admission to public HE. As for women, despite their improved access to HE, it is recognised that their acquisition of cultural capital is affected by demands on their time that limit their possibilities for study (ARTES; RICOLDI, 2016). The situation was noticeably more difficult for women attending private HE centres, as these women mostly also worked.

It was observed that students who did not work received better grades, as, logically, the work-study burden results in less time for study and greater fatigue. The assimilation of embodied cultural capital, in particular, is affected, given that acquisition depends on a time investment by the agent (BORDIEU, 1986, p. 1977). A student who holds down a job while studying — presumably due to economic necessity — has limited time for study and, consequently, for the acquisition of further cultural capital than an individual who does not need to work out of economic necessity. Employed students, for instance, are restricted in their acquisition of cultural capital due to non-participation in student bodies and not having time to study alone or in groups (ZAGO, 2006).

A key economic capital variable is family income. It was observed that all income ranges were significant in explaining student performance; moreover, as income increased, its influence on student performance also increased. These findings are consistent with theories that adequate income facilitates access to both capital and sources of capital. With a higher income, for instance, an individual can attend better schools, visit theatres, museums and cinemas, acquire books and learning materials, ensure time and space for studying and pay for tutoring, all of which help in the accumulation of cultural capital (BOURDIEU, 1986; COLEMAN, 1988; TAVAKOLI, PAHLAVANNEZHAD; GHONSOOLY, 2017).

Funding in the form of grants or scholarships — another variable associated with economic capital and linked to the student's family background — was significant only for private HE students. Funds compensate in part for the lack of economic capital among low-income students, as scholarships or grants pay fees for private HE centres or maintenance costs for attendance at public HE centres. Most of these scholarships are offered by the government under the umbrella of public policies aimed at favouring access to HE by individuals with low economic capital. Since individuals must obtain a minimum grade in the selection process in order to receive government funding, they have to invest greater efforts in acquiring knowledge (cultural capital). In this case, the expectation of obtaining a grant or scholarship may lead the individual to the development of appropriate practices that favour the acquisition of more cultural capital (BOURDIEU, 1977, 1984, 1986). Students in receipt of government funding must also consistently perform well, as otherwise they may lose their grant or scholarship. Thus, restrictions imposed regarding funding explains the statistical significance of this variable in the performance of private HE centre students. On the other hand, it is possible that the difference between public and private HE centres is the funding criterion; in other words, whereas in private centres the focus is on results, in public centres the focus is more social in nature.

In the case of the secondary education (ENEM) variable, it was observed that, in public HE centres in which most students were from economically and culturally more privileged families, the education level in the municipality did not affect student performance. Since these families could theoretically afford to send their children to the best private schools, the impact of the environment on the individual's performance was minimised. For students in private HE centres, however, the educational environment of the municipality was of

greater relevance. Thus, the better the educational performance of the municipality, the higher the ENADE grade obtained by students.

The employment-and-income variable, which reflects the economic dynamism of municipalities, only had an impact on the performance of students in public HE centres. It is possible that some families of students at public HE centres from more economically dynamic municipalities had more economic capital due to income inequalities between the more wealthy and the less wealthy sectors (MEDEIROS; SOUZA; CASTRO 2015). In private HE centres, the fact that a significant proportion of students might be from lower social classes would eliminate any effect of this employment-and-income variable. This variable also reflects better or worse conditions in the municipality itself. Thus, municipalities where employment and income levels are better can offer students better and more access to didactic resources, such as public libraries, free internet, public transportation and other resources that can improve student performance (CHIU, 2007; LAROS; MARCIANO; ANDRADE, 2012).

It was also observed that the health variable — reflecting health conditions in the municipality — was positively associated with student grades, indicating that environments that offer better health conditions — basic sanitation, disease control, reduced infant mortality, etc — foster better performance by students. This finding corroborates reports that health promotes mental vigour, favours cognitive ability and fosters learning capacity, all of which enhance the productivity of individuals (BHARGAVA ET AL., 2001; BLOOM; CANNING; SEVILLA, 2004; NEDUZIAK; CORREIA, 2017).

The pedagogy variable was positive and significant for both public and private HE centres, corroborating the view that more appropriate contexts augment possibilities for increasing cultural capital and improving student performance, as asserted by Bourdieu (1986), who proposed that transmission and inculcation of cultural capital is easier when the individual is immersed in an environment favourable to the acquisition of cultural capital.

In the case of the employment contract variable, it was expected that HE centres with a greater proportion of full-time instructors would be able to assist students with research and publication and would bring this knowledge into the classroom and so enhance the transmission of knowledge to students. However, the fact that this was not the case for either public or private HE centres in our study corroborates the findings of Adriola (2009) and Lacerda and Ferri (2015).

A positive relationship between faculty qualifications and student HE performance was reflected by the number of PhDs in the public HE centres and the number of PhDs and masters in the private HE centres. This result corroborates findings by Zonatto et al. (2013), Miranda, Nova and Júnior (2013) and Lacerda and Ferri (2015). Thus, the more elements in a HE centre that transmit cultural capital, the more likely it is that students will absorb them (Bourdieu, 1986). This finding is reinforced by the fact that the coefficient for doctors ( $\beta = 0.45$ ) was higher than that for masters ( $\beta = 0.17$ ), suggesting that student performance was favoured more by the number of PhDs than by the number of masters in HE centres.

Instructors with PhDs have more institutionalised cultural capital than instructors with masters, as reported by Tavakoli, Pahlavannezhad and Ghonsooly (2017) and Jæger and Møllegaard (2017) in demonstrating the importance of the cultural capital of teachers. For public HE centres, the fact that the number of instructors with masters was not significant may be related to how instructors are selected. Most competitions

are intended for PhDs and, according to Inep (2017) data, in public compared to private HE centres, the number of PhDs is practically double, whereas the number of masters is half.

The infrastructure variable was significant and negative for public HE centres, but not significant for private HE centres. While this contradicts the perception that a better infrastructural context may favour the acquisition of cultural capital, the finding is corroborated by other studies (ADRIOLA, 2009; LACERDA; FERRI, 2015). However, further research in this area is necessary, given that it is difficult to perceive what might be considered a ‘good infrastructure’ by students (it might, for instance, be associated with spaces not directly associated with learning).

It was observed that HE centres were not able to compensate for deficiencies of social origin, since both individual factors and factors associated with the HE centres affected student performance. This would indicate the need to develop strategies aimed at mitigating the impact of social origin (O’ SHEA, 2016; JOHANSSON; HÖJER, 2012; GALE; PARKER, 2017).

However, in spite of the importance of the variables associated with HE centres, so much so that there are metrics evaluated by the Ministry of Education in Brazil on all the organizational variables discussed above, it is important to reinforce that the cultural capital possessed by the individual will allow or not to maximize the use of available resources in the academic environment. It is in this sense that actions in the attempt to minimize the deficiencies of social origin are as important as the strategies to develop the professional competences of the individual. This is because cultural capital plays a relevant role in the performance of individuals. That is, however interesting and relevant the strategies used by HE centres, including the hiring of teachers with higher levels of academic training, such as masters and doctorates, and infrastructure improvement, it is relevant to reflect how these actions can be reconciled with others that to mitigate the deficiencies of cultural capital of individuals of less privileged social origin so that they can take advantage of the resources made available by HE centres.

## 7 CONCLUSIONS

It was verified that social origin continues to impact on student performance even at the HE level and in both public and private HE centres, although with differences according to the kind of centre. The thesis of social reproduction is also reinforced, indicating that class-based positions become entrenched. This would suggest — in the interest of ensuring equal opportunities and promoting social mobility — the need for a rethinking not only of policies for accessing HE but of ways in which the Brazilian education system could minimise the effect of social origin on student performance.

It was observed that centres with more PhDs and a better pedagogical structure significantly influenced student performance in both public and private HE centres. This would point to the important role played by HE centres in improving student performance. On the other hand, while infrastructure and the number of masters had different effects on student performance in public and private HE centres, instructor contract type had no impact. Further studies are needed to explore the underlying reasons for these results.

Regarding environmental factors — evaluated by the employment-and-income, health and secondary school variables — only health had any influence on public and private HE centres.

A more relevant finding refers to perceptions of the different effects of the three dimensions, namely, that of the individual, of the HE centre and of the environment as represented by the municipality. It was the cultural and economic capitals possessed at the individual level which most consistently influenced the performance of students.

Finally, we found that students from lower social classes did not perform as well as students from higher social classes, even in public HE centres. This finding demystifies the idea — especially regarding students who access HE through affirmative policies — that the playing ground is levelled once individuals are within the HE system. In this sense, for the policymakers of access to higher education, these results suggest that there is a need to build other public policies associated with access to higher education as a way to try to correct differences of social origin, since the results indicate that at the end of higher education, individuals of less privileged social origin continue to suffer disadvantages compared to their peers of more privileged social origin, which hinders the social mobility of those individuals.

At the academic level, it is also necessary to reflect on pedagogical actions that also allow the amplification of the cultural capital of the individuals lacking them. This would favor the expansion of their capacities and the equality of the chances of success of the individuals from the less privileged classes, upon completing higher education, since the data indicate that although these individuals complete this level of education, the disadvantages continue to be perpetuated. Thus, pedagogical practices should incorporate actions that minimize the differences brought by individuals from different classes, without neglecting the contents necessary for their professional training. To forget these differences even at the higher level is to contribute to the reproduction of class positions in society

A limitation of this study that could be addressed in future research is the limited number of individual variables used and the non-use of variables at the course level. Another important limitation refers to the time lag since the available data of the environment dimension are only available until the year 2013. New studies may test variables of this dimension that are more recent to verify the persistence of the phenomenon studied here.

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