DOI http://dx.doi.org/10.20947/S0102-3098a0300

ORIGINAL ARTICLE

Influence of family composition on academic performance*

Miriã Rodrigues Garcia**
Eduardo Tillmann***

This study aims to investigate the causal influence of family structure on the academic performance of 5th-grade elementary students in Brazil, while exploring additional factors that could impact this relationship. This is achieved using propensity score matching based on data from the Brazilian Basic Education Assessment System (Saeb) for 2019. The results indicate a significant positive difference in academic performance among students residing in biparental households compared to those living with a single parent. Regardless of contextual backgrounds, the positive impact on academic performance of having both parents remains consistent. An exception is observed when grandparents also live with the students. This highlights potential resource competition and socioeconomic disadvantages often associated with multigenerational households. Therefore, this study underscores the critical role of family composition in shaping school performance, emphasizing the importance of implementing strategies to mitigate the adverse effects of single-parent household structures on learning, given their potential to affect a broad spectrum of future socioeconomic outcomes.

Keywords: Elementary education. Academic achievement. Single parent households. Biparental households.

* This article is based on the Master's dissertation by Miriã Rodrigues, titled *Influência da composição familiar no desempenho acadêmico*, developed within the Graduate Program in Applied Economics at the Federal University of Rio Grande (FURG), 2023.

** Universidade Federal de Pelotas (UFPel), Pelotas-RS, Brazil (rodriguesmiria98@gmail.com; https://orcid.org/0000-0002-6606-7684).

*** Universidade Federal do Rio Grande (FURG), Rio Grande-RS, Brazil (etillmann@gmail.com; https://orcid.org/0000-0003-1990-407X).

Introduction

Family structure plays an important role in promoting and transmitting values, norms and skills essential for personal development and future opportunities. More specifically, family dynamics can influence behavior (Carlson; Corcoran, 2001) and the educational environment (Jeynes, 2017; Koepp *et al.*, 2022), and provide emotional support (Bzostek; Berger, 2017) and vital resources that expand learning opportunities (Osborne; Berger; Magnuson, 2012; Hastings; Schneider, 2021).

Thus, family characteristics and composition can directly impact children's chances for progress and development. From a very young age, individuals differently develop a wide range of skills responsible for much of the variation in socioeconomic outcomes (Cunha *et al.*, 2006). The family is therefore fundamental in a child's upbringing, influencing both the transmission of genes and the pre- and post-natal environments which interact to shape children's skills, behavior and talents (Heckman, 2008).

Consequently, this study aims to investigate the influence of family structure on school learning, seeking to identify causality in this relationship. To achieve this goal, the study employs the Propensity Score Matching method to explore differences in academic performance among 5th-grade students in Brazilian public schools, comparing those from two-parent households with those from single-parent households.

Several studies, including McLanahan and Sandefur (1994), Downey (1994), Ginther and Pollak (2003), Jeynes (2012) and McLanahan and Percheski (2008) highlight that changes in family structure, whether due to divorce or the loss of a parent, negatively affect children's school performance. However, an important debate in the literature concerns whether the unfavorable outcomes identified for children experiencing such ruptures result from causal effects of family structure, or reflect pre-existing problems among families (Li, 2007; Amato; Anthony, 2015; Umberson; Thomeer, 2020). That is, as parents decide to divorce, the unobservable factors that lead to the end of the marriage can also negatively affect the children, such that the influence of divorce on children's outcomes may be spurious.

To address this criticism, our study, like Frisco *et al.* (2007), Hussey *et al.* (2016) and Peñaloza *et al.* (2022), uses matching techniques to address endogeneity and self-selection. This method allows the identification of students from single- and two-parent households who are similar in observable characteristics, thus avoiding concerns regarding selection bias, and enabling more accurate and precise results for the phenomenon under investigation.

The article also seeks to identify heterogeneous effects, that is, to explore whether other factors related to family structure can influence students' academic performance. To accomplish this, the sample of students is refined to assess the influence of residing in biparental families within contexts where students are actively encouraged to study or exhibit study and reading habits. Furthermore, the study examines the impact of family

structure on students who work, perform domestic chores, or reside with siblings or grandparents.

The results indicate that students from two-parent households exhibit superior academic performance, as evidenced by higher grades in both Portuguese and Mathematics. More specifically, students residing with both parents achieve, on average, grades 0.15 standard deviations higher compared to their counterparts in single-parent households in both subjects. The results for the heterogeneous effects show that regardless of the context, the average effect identified for the presence of both parents on academic performance persists. The exception occurs among students who also live with their grandparents, where it is not possible to identify differences in performance between students who live in single- and two-parent households.

One possible explanation is the negative relationship between family size and school performance, which arises from the need to dilute family resources in larger families (Blake, 1989; Becker, 1991). Furthermore, although some studies highlight the potential benefits of grandparental involvement in grandchildren's outcomes, co-residence in three-generational households has been associated with socioeconomic disadvantages (Kreidl; Hubatková, 2014; Tanskanen; Danielsbacka; Erola, 2016).

This work, in addition to this introduction, is divided into four further sections. Section 2 covers the literature review. Section 3 describes the data and methodology used in the research. Section 4 contains the results and the discussion. Section 5 offers the final considerations.

Literature review

The literature addressing the relationship between education and the development of human capital emphasizes that skill formation is composed of a dynamic process with synergistic elements, whereby investments made during childhood can promote additional investments in the future (Heckman; Lochner; Taber, 1998). This view highlights the importance of the family in shaping individuals, whether through genetic transmission, parental investments during upbringing, or the family environment itself (Heckman, 2008).

In this context, family structure plays an essential role in raising children, as it is linked to factors such as the availability of time and the level of family resources (Jeynes, 2005). Experiences within the family also have important consequences for adult life, as characteristics such as human capital, marital stability and income tend to be passed on over time (Conlisk, 1974; Amato; DeBoer, 2001; Hofferth; Goldscheider, 2010; Holmlund; Nybom, 2023).

Family composition, therefore, plays a fundamental role, as children who grow up with continuously married parents are less likely to experience a wide range of cognitive, emotional and social problems throughout life (Amato, 2005). Ruptures in

the family structure, whether due to divorce or death, negatively affect children's school performance, educational attainment, health and the behavior (Carlson; Corcoran, 2001; Bachman; Coley; Carrano, 2009; Rasmussen, 2009; Bai, 2012; Cid; Stokes, 2013; Peñaloza *et al.*, 2022).

One reason for this is that biparental families are more likely to meet children's needs, as parents can alternate tasks and thus dedicate more time to their children (Leibowitz, 1974; Hsin; Felfe, 2014; Del Bono *et al.*, 2016). Involvement in school tasks, as well as monitoring study, attention, and overall interaction with children are lower in single-parent families, which can lead children to feel overwhelmed, perform worse at school and, consequently, drop out (Astone; Maclanahan, 1991; Hetherington; Lingempeel, 1992; Simons, 1996; Thomson *et al.*, 1992).

In addition to the time devoted to children, Becker and Tomes (1976, 1979) emphasize the importance of family resources. According to the authors, families with more resources have a greater capacity to invest in education, health and other factors that influence child development. Due to the greater availability of resources, Entwisle and Alexander (1995, 1996) argue it would be preferable for children to live in biparental families, as household income would be higher than in families with separated parents, thus providing greater support.

In this context, Biblarz and Gottainer (2000) identify that the children of single mothers have significantly lower educational attainment levels, occupational status, and happiness in adulthood. According to the authors, this is due to the fact that divorced single mothers often hold lower occupational positions, experience more financial stress, and participate more actively in the labor market. Machado and Gonzaga (2007) support this finding, noting that children from more advantages social backgrounds tend to stay remain in school longer. Conversely, children whose parents have lower income and educational attainment levels show a greater predisposition to falling behind academically.

Regarding school grade performance, Pong, Dronkers and Thompson (2003) examine eleven countries and find that single parenthood is linked to lower performance in Mathematics and Science accross all countries evaluated, except Austria and Iceland. In Brazil, Lima and Santos (2016) and Martins and Teixeira (2021) report a negative effect on academic performance of students experiencing ruptures in family structure, mainly in households headed by the father. Additionally, the literature highlights post-divorce parental conflict among the most common factors behind the harmful effect of single parenthood,as it tends to cause psychological stress in children, thereby damaging their academic performance (Amato; DeBoer, 2001; Amato; Keith, 1991; Dronkers, 1999).

Authors such as Blake (1989) and Becker (1991) draw attention to the fact that available resources, such as money, time, energy and patience, are limited, and shared among all family members. Therefore, in larger family structures, resources are diluted,

which reduces the resources available for each member. This constitutes a trade-off between the quantity and quality of children (Becker; Lewis, 1973; Hanushek, 1992). Furthermore, if parents allocate resources efficiently, children expected to yield higher returns in the long term are likely to receive greater investments. Consequently, the resources received by each child depend on both family size and characteristics.

This issue is particularly concerning in Brazil, where declining fertility rates and an ageing population have contributed to significant shifts in family structure. Traditional two-parent households with children are becoming less common, increasingly replaced by a wider variety of arrangements, including single-parent families, single-person households, and couples without children (IBGE, 2024). Although the reduction in the number of dependent children has contributed to a higher *per capita* income, this benefit has been largely concentrated among higher-income urban populations (Maia; Sakamoto, 2016; Terra; Hermeto, 2024). In contrast, among lower-income families, changes in household composition have negatively impacted income distribution. The rapid expansion of single-headed households, especially those led by single mothers, has been associated with a decline in average *per capita* income (Leone *et al.*, 2010; Maia; Sakamoto, 2016; Terra; Hermeto, 2024). Moreover, the shift toward single-headed family structures has also been associated with poorer educational outcomes and health indicators (Menezes-Filho, 2012; Ayllón; Ferreira-Batista, 2015; Martins; Teixeira, 2021; Lima *et al.*, 2021; Strapazzon *et al.*, 2025).

Family structure, therefore, influences the learning of values, norms and skills essential for personal development and future opportunities (Sen, 1999; Nussbaum, 2011). In education, it plays a critical role in the transmission of educational opportunities, fostering greater accumulation of knowledge and skills, which, in turn, increases productivity, and leads to greater possibilities of future financial gains.

Data and empirical strategy

This study uses data from the Basic Education Assessment System (Saeb), administered by National Institute of Educational Studies and Research Anísio Teixeira (Inep), focusing on 5th-grade students in Brazilian public schools during the 2019 assessment cycle. Saeb is a biennial nationwide survey designed to evaluate students' academic proficiency in Mathematics and Portuguese, and is complemented by socioeconomic questionnaires asnwered by students, teachers, principals and schools. Table 1 below describes the variables used in this study.

TABLE 1
Description of variables

Variable	Description
Biparental	1 if the student lives in biparental households, otherwise 0
Sesz	Student socioeconomic index, created from the number of bathrooms, bedrooms, computers, televisions, and cars in the student's household
White	1 if the student declares to be white, otherwise 0
Siblings	1 if the student lives with siblings, otherwise 0
Grandparents	1 if the student lives with grandparents, otherwise 0
Maxschparents	Highest level of education attained by the parents. 0, indicates completion of up to the 5th grade of Elementary School; 1, completion of primary education; 2, completion of high school; 3, completion of higher education
Housework	1 if the student engages in household chores for more than 1 hour, otherwise 0
Work	1 if the student works, otherwise 0
Urban	1 if the student lives in urban zones otherwise 0
adquacy_ teachers	School index of adequacy of early grades teachers to their training. It assesses the percentage of teachers in the school who hold a bachelor's degree in the same subject they teach, or a bachelor's degree in the same subject with a pedagogical complementation course
Inse	School socioeconomic index. Distributed across seven levels, where 7 is the highest
Preschool	1 if the student attended preschool, otherwise 0
Repeater	1 if the student repeated a school year, otherwise 0
Habstudying	1 if the student has the habit of studying outside of school, otherwise 0
Habreading	1 if the student has the habit of reading, otherwise 0
Incent	1 if the student receives parental incentive with school matters, otherwise 0. Parental school incentive includes discussing school events, encouraging studying, homework completion and school attendance
Mathz	Standardized Math test score
math	Math test score
Portz	Standardized Portuguese test score
port	Portuguese test score

Note: Adequacy_teachers and Inse are taken from INEP's website. For more information see: https://www.gov.br/inep/pt-br/acesso-a-informacao/dados-abertos/indicadores-educacionais/.

Beyond examining metrics for academic performance and family composition of the students, i.e. whether they come from two-parent or single-parent households, this study uses student characteristics such as race, guardians' educational level, urban residence, employment status, grade repetition, preschool enrollment, and responsibility for household chores. It also considers households' assets and characteristics, which are used to create an indicator of socioeconomic status using the first component of Principal Component Analysis, as suggested in Jolliffe (2002). School characteristics, such as adequacy of teacher training at the initial grades and the schools' socioeconomic index (Inse) are also used.

Additionally, the Saeb questionnaire provides insights into students' allocation of time to extracurricular activities and parental involvement in assisting their children with these activities. Descriptive statistics of the final sample used in this study are presented in Table 2 below.

TABLE 2
Descriptive statistics of individual, family and school characteristics employed in this study
Brazil – 2019

Variables	Observations	Mean	Std. Dev.	Min	Max
Biparental	523,718	0.6876	0.4634	0	1
Sesz	523,718	0	1	-2.9153	2.8006
White	523,718	0.3513	0.4774	0	1
Siblings	523,718	0.7612	0.4264	0	1
Grandparents	523,718	0.2465	0.4309	0	1
Maxschparents	523,718	1.6564	1.1033	0	3
Housework	523,718	0.3414	0.4742	0	1
Work	523,718	0.1287	0.3348	0	1
Urban	523,718	0.8895	0.3134	0	1
adquacy_teachers	523,718	73.6422	22.5597	0	100
Inse	523,718	4.2915	1.0438	1	7
Preschool	523,718	0.7827	0.4124	0	1
Repeater	523,718	0.1539	0.3608	0	1
Habstudying	523,718	0.2663	0.442	0	1
Habreading	523,718	0.4653	0.4988	0	1
Incent	523,718	0.8583	0.3486	0	1
Mathz	523,718	0.3272	0.9711	-2.4312	2.6873
Math	523,718	239.16	46.8783	105.9985	353.09
Portz	523,718	0.3079	0.9705	-2.3455	2.4997
Port	523,718	225.32	48.4797	92.7901	334.808

Source: Inep. Sistema de Avaliação da Educação Básica (Saeb). Elaboration of the authors.

To examine learning disparities among students living in single-parent or two-parent households, the study employs the Propensity Score Matching (PSM) method to estimate the Average Treatment effect on the Treated (ATT). This approach involves pairing individuals living with only one parent (control) with those living with both parents (treated). The proximity between these two groups, measured by the propensity score, is determined based on observable students' characteristics, enabling the identification of differences between them.

The propensity score method, introduced by Rosenbaum and Rubin (1983), mitigates selection bias by estimating the probabilities of receiving treatment given observable variables, thereby generating a weight ranging from 0 to 1 (Gertler *et al.*, 2011). Thus, the estimation of the probability of being treated, $\Pr(P_i = 1 \mid X_i)$ is referred to as the propensity score. Consequently, as indicated by Caliendo and Kopeinig (2008), grouping individuals with similar probabilities of receiving treatment ensures that the outcome is conditionally independent of whether the student received treatment of not, such that:

$$(Y_0, Y_1) \perp T \mid p(X) \quad (1)$$

Where, Y is the outcome of interest, T denotes the treatment, and $p(X)$ is the propensity score estimated based on the explanatory variables. The purpose is to estimate the average treatment effect on treated individuals, which is defined as:

$$ATT = E[E\{Y_{1i} \mid T=1, p(X_i)\} - E\{Y_{0i} \mid T=0, p(X_i)\} \mid T = 1] \quad (2)$$

Where Y_{1i} and Y_{0i} are the results of the treatment and control groups, with the units defined by the index i.

This article uses the nearest neighbor (NN) matching approach, one of the most widely utilized matching techniques. In this method, each treatment unit is matched with the comparison unit having the closest propensity score (Khandker; Koolwal; Samad, 2010). The researcher can select the number of nearest neighbors and create n pairings. To ensure robustness and examine consistency, this study considers one (NN = 1), three (NN = 3) and five (NN = 5) nearest neighbors.

As highlighted by DiPrete and Gangl (2004), the results obtained by matching through propensity score may lack consistency if treatment assignment is endogenous, i.e. if unobservable variables affecting the likelihood of treatment also influence the results. In studies of family structure, such endogeneity is a potential concern due to unobserved factors such as family conflict, parenting style, and involvement in school activities. Consequently, assessing the robustness of estimation results requires scrutiny of potential inconsistency arising from omitted variable bias. To address this concern, the study employs the sensitivity test known as Rosenbaum bounds (Rosenbaum, 2002). This test allows the probability of individual treatment participation to be defined using a logistic function, determined by the observable characteristics, X_i, and unobservable characteristics, u_i, such that $P(X) = \Pr(P_{i,0} = 1 \mid X_{i,-1}) = F(\beta X_i + \gamma u_i)$. If the omitted variable is irrelevant, γ will equal zero and treatment assignment will be solely determined by X_i. However, if bias is present, γ will take a nonzero value, resulting in two individuals with identical characteristics having different probabilities of receiving treatment.

Therefore, after pairing two individuals j and i, the odds ratio for both receiving treatment, in case $X_i = X_j$, is given by:

$$\frac{\dfrac{P(X_i)}{1-P(X_i)}}{\dfrac{P(X_j)}{1-P(X_j)}} = \frac{P(X_i)[1-P(X_i)]}{P(X_j)[1-P(X_j)]} = \frac{F(\beta X_i + \gamma u_i)}{F(\beta X_j + \gamma u_j)} = \exp[\gamma(u_i - u_j)] \quad (3)$$

Thus, if there are no differences in unobserved variables ($u_i = u_j$) and if these variables do not influence the probability of participation ($\gamma = 0$), the odds ratio will be equal to 1. This indicates that treatment assignment depends solely on observable characteristics, i.e., X_i. When the odds ratio is different from 1, it indicates selection bias due to omitted variables.

Sensitivity analysis evaluates how much the treatment effect changes with variations in the values of γ and ($u_i = u_j$). In practice, this involves examining the bounds of the participation odds ratio (Becker; Caliendo, 2007), which as suggested by Rosenbaum (2002), is carried out by the following equation, where $\Gamma = e^{\gamma}$:

$$\frac{1}{\Gamma} \leq \frac{P(X_i)[1-P(X_i)]}{P(X_j)[1-P(X_j)]} \leq \Gamma \quad (4)$$

Both paired individuals have equal probabilities of receiving treatment only if $\Gamma = 1$. Otherwise, individuals deemed similar based on observable characteristics may differ in their chances of receiving treatment. As emphasized by DiPrete and Gangl (2004), the critical value of the test (Γ) evaluates the influence that omitted variables must exert for the treatment effect identified through propensity score matching to result from non-randomness in treatment allocation. Simply put, the critical value indicates the magnitude of influence required for unobservable variables to violate the hypothesis of conditional treatment independence, as outlined in equation (1).

Results and discussion

Influence of family structure on students' academic performance

The results of evaluating the effects of residing in biparental households compared to living with only the mother of the father, for 5th-grade students in Brazilian public schools, are presented in Table 3 below.

TABLE 3
Effect of residing on a two-parent family on Mathematics and Portuguese proficiency in 5th grade elementary school students
Brazil – 2019

Disciplines	Number of neighbors	Mean treated	Mean control	ATT	Std. error	T-stat
Mathematics	NN 1	0.4046	0.2452	0.1531	0.0043	37.07
	NN 3	0.4046	0.2454	0.1593	0.0037	42.59
	NN 5	0.4046	0.2450	0.1596	0.0036	43.23
Portuguese	NN 1	0.3784	0.2280	0.1504	0.0043	34.70
	NN 3	0.3784	0.2282	0.1502	0.0037	40.05
	NN 5	0.3784	0.2293	0.1491	0.0036	41.23

Source: Inep. Sistema de Avaliação da Educação Básica (Saeb). Elaboration of the authors.

The results show high levels of statistical significance across all three nearest neighbors specifications, both in Mathematics and Portuguese. Consequently, students living with both parents score, on average, approximately 0.15 standard deviations higher than their counterparts from single-parent families, both in Mathematics and Portuguese.

These findings align with existing literature emphasizing the academic disadvantages associated with single-parent family structures, as documented by Pong, Dronkers and Thompson (2003), Frisco *et al.* (2007), McLanahan *et al.* (2013) and Hussey *et al.* (2016). Among Brazilian national studies, Lima and Santos (2016) conducted two separate analyses on the influence of family structure on academic performance. They found that disruptions in family structure over time significantly impact students' academic outcomes when examining a panel of schools. However, in a cross-sectional analysis using multivariate regressions, they observed only minimal effects of the presence of both parents on academic performance. Similarly, Martins and Teixeira (2021), note that students from single-parent

households, especially in families headed by the fathers, generally underperform compared to those from two-parent families.

The analysis of the average treatment effect on the treated (ATT) in this research relies on the assumption of conditional independence. However, the potential presence of omitted variables raises concerns, as they can bias these estimates. To quantify the extent of this potential bias in estimations and enhance robustness, conducted sensitivity tests using Rosenbaum bounds are shown in Table 4 below.

TABLE 4
Critical values of the Rosenbaum bounds sensitivity tests

Biparental families	Matching		
	NN 1	NN 3	NN 5
Mathematics	1.3	1.3	1.4
Portuguese	1.2	1.3	1.4

Source: Elaboration of the authors.

The sensitivity tests mitigate the impact of omitted variables on the results, as it identifies critical values between 1.2 and 1.4. Notably, the lowest values are observed in pairings involving a smaller number of neighbors. Conversely, pairings with 5 neighbors yielded critical values of 1.4 across both subjects. According to DiPrete and Gangl (2004), this implies that the confidence interval for the effect of living in two-parent families on Mathematics and Portuguese performance includes zero, that is, it is statistically null, only if an unobserved variable causes a difference in the odds ratio of treatment between students from single and two-parent families by a factor of 1.4.

Only with an influence of this magnitude can students who are similar in terms of observable characteristics differ in their likelihood of receiving treatment, thus violating the assumption of conditional independence of the treatment. Consequently, the robustness test suggests that the obtained estimates can be interpreted as reflecting the causal effect of family structure on students' academic performance.

Heterogeneous effects of family structure on school performance

The current study also aims to assess factors associated with family structure that may influence students' academic performance. To achieve this, the sample of students is restricted, resulting in subsamples whose matching outcomes will be compared to the full sample presented in Table 3. The objective is to investigate potential variations in the effect of family structure among students in each of these contexts.

Initially, we investigate the proactive involvement of parents, including the support parents provide to their children regarding school activities. Additionally, we examine whether extracurricular activities related to student learning, such as study and reading habits, have any influence on the effect of family composition on students' academic outcomes. The results of the average effect of belonging to a two-parent family for each of these subsamples are presented in Table 5 below.

TABLE 5
Effect of parental encouragement, study habits, and reading habits on Mathematics and Portuguese performance in 5th grade elementary school students
Brazil – 2019

Variables	Treated	Control	ATT	Std. error	T-stat
Parental encouragement					
Matemathics – NN 5	0.4293	0.2700	0.1593	0.0039	40.86
Portuguese – NN 5	0.4102	0.2606	0.1496	0.0039	38.19
Study habit					
Matemathics – NN 5	0.5059	0.3130	0.1928	0.0073	26.22
Portuguese – NN 5	0.4521	0.2730	0.1791	0.0073	24.49
Reading habit					
Matemathics – NN 5	0.4887	0.3324	0.1563	0.0054	29.02
Portuguese – NN 5	0.4893	0.3390	0.1504	0.0053	28.12

Source: Inep. Sistema de Avaliação da Educação Básica (Saeb). Elaboration of the authors.

Table 5 presents the average treatment effects estimated within each subsample, identifying an increase in Mathematics and Portuguese grades among 5th year students who live with both parents compared to those who live with single parents, regardless of whether they receive parental encouragement or possess the habit of studying or reading. The influence of two-parent family structure on Mathematics ranges from 0.15 to 0.19 standard deviations, while in Portuguese, it ranges from 0.15 to 0.18 standard deviations. Thus, the difference in performance between students from two-parent and single-parent families observed in the analysis with the full sample persists.

Additionally, it's noteworthy to examine the average performance observed for treated and control groups, as illustrated in Columns 2 and 3 of Table 5. These indicate that each subsample displays higher academic performance compared to the full sample (Columns 3 and 4 of Table 3). This rise in performance underscores the significant role of family in academic achievement, as emphasized in studies by Jeynes (2017), Koepp *et al.* (2022) and Macana *et al.* (2021; 2022). Moreover, the engagement in educational activities outside the school environment, such as completing homework (Silva; Rousseau; Deslandes, 2010; Rodrigues, 2017), or fostering a reading habit (Mata; Monteiro, 2005; Sabino, 2008), also contributes to students' improvement and development.

Furthermore, it is crucial to highlight that the greatest difference between treated and controls, in both subjects, is identified among students who have a study habit. For these, Mathematics results increase by 0.19 standard deviations, and 0.18 in Portuguese. This difference arises from the fact that study habits seem to translate into greater performance among students from two-parent families than among those from single-parent families. This contrast becomes evident when comparing the average performance of treated and control students in Table 5 (Columns 2 and 3) with those of the general sample in Table 3 (Columns 3 and 4). Specifically, the average Mathematics performance of students with a study habit and living in two-parent families is 0.10 standard deviations higher than that of

the full sample, while among controls, the average performance is higher by 0.07 standard deviations. In Portuguese, the increase in average performance among those treated, when considering only students with a study habit, is 0.07 compared to the general sample, while among controls, it is 0.04.

Moreover, the results concerning reading habits are also worth highlighting. These findings depict the smallest grade differential between students from two- and single-parent families. This is because they showcase the most significant performance boost among students from single-parent families. The average performance among controls is 0.09 standard deviations higher than the general sample in Mathematics and 0.11 standard deviations higher in Portuguese.

This study also aims to investigate disparities in the average treatment effect based on students' involvement in work-related activities. Hence, Table 6 illustrates the outcomes for two distinct subsamples: one solely including students who report working, and the other comprising those engaged daily in more than an hour of household chores.

TABLE 6
Effect of working and performing household chores on Mathematics and Portuguese proficiency in 5th grade elementary school students
Brazil – 2019

Variables	Treated	Control	ATT	Std. error	T-stat
Works					
Mathematics – NN 5	0.0724	-0.1136	0.1861	0.0097	19.23
Portuguese – NN 5	-0.0879	-0.2643	0.1764	0.0096	18.36
Household chores					
Mathematics – NN 5	0.3654	0.1980	0.1674	0.0062	26.78
Portuguese – NN 5	0.3639	0.2145	0.1493	0.0063	23.78

Source: Inep. Sistema de Avaliação da Educação Básica (Saeb). Elaboration of the authors.

The influence of being part of a two-parent family on academic performance persists even when the sample is confined to students who hold jobs or undertake domestic responsibilities. In other words, the average treatment effect remains positive and statistically significant in both subsamples and across the two subjects under scrutiny. Specifically, among working students, the effect stands at 0.19 standard deviations in Mathematics and 0.18 standard deviations in Portuguese. For those engaged in domestic work, the disparity stemming from living in a two-parent family amounts to 0.17 standard deviations in Mathematics and 0.15 in Portuguese. These results, consequently, closely mirror those identified for the full sample, as depicted in Table 3.

It is worth noting that the average performance of both treated and control groups notably decreases when the sample is confined to students who also hold jobs. This finding is consistent with existing literature, such as Emerson, Ponczek and Souza (2017), Bezerra, Kassouf and Arends-Kuenning (2009) and Orazem and Gunnarsson (2004), which underscore the adverse impact of employment demands on student learning. Similarly, responsibility for domestic tasks is associated with declines in academic development

(Alberto *et al.*, 2011). This trend is evident when comparing the full and restricted samples, particularly in Mathematics. Regardless of whether they reside in two-parent or single-parent households, students engaged in more than an hour of household chores exhibit an average performance decrease of 0.04 standard deviations.

Furthermore, the analysis aims to determine whether the average effect of living with both parents on academic performance differs when the family composition also includes siblings or grandparents. These findings are detailed in Table 7.

TABLE 7
Effect of the presence of siblings and grandparents in the household on the Mathematics and Portuguese grades of 5th-grade elementary school students
Brazil – 2019

Variables	Treated	Control	ATT	Std. Error	T-stat
Reside with siblings					
Mathematics – NN 5	0.3732	0.2182	0.1551	0.0042	37.30
Portuguese – NN 5	0.3389	0.1956	0.1433	0.0042	34.40
Reside with grandparents					
Mathematics – NN 5	0.2149	0.2047	0.0102	0.0060	1.71
Portuguese – NN 5	0.1783	0.1972	-0.0188	0.0061	-3.10
Reside with siblings and grandparents					
Mathematics – NN 5	0.1727	0.1501	0.0226	0.0069	3.26
Portuguese – NN 5	0.1298	0.1386	-0.0088	0.0070	-1.26
Reside with siblings, grandparents and more					
Mathematics – NN 5	0.0047	0.0518	-0.0471	0.0103	-4.57
Portuguese – NN 5	-0.0626	0.0326	-0.0952	0.0105	-9.07

Source: Inep. Sistema de Avaliação da Educação Básica (Saeb). Elaboration of the authors.

The importance of residing with both parents on academic performance persists when considering students who live with siblings. Among this group, the treatment effect in Mathematics amounts to 0.15 standard deviations, and 0.14 standard deviations in Portuguese. However, among students who cohabit with at least one grandparent, the effect loses statistical significance, as indicated by the T-stat, and can be considered different from zero only in the Portuguese assessment. Specifically, among students with at least one grandparent, also living with both parents leads to a decrease in performance in this subject by approximately 0.02 standard deviations. Nevertheless, the results of the Rosenbaum Limits sensitivity tests, shown in Table 1A in the Appendix, reveal a critical value of 1.0. Consequently, it is not feasible to dismiss the possibility that omitted variables are influencing this result.

The null effect of residing in two-parent families alongside grandparents prompts consideration of potential complementarities associated with cohabiting with grandparents. As highlighted by Coutrim *et al.* (2007), grandparents typically prioritize education and can provide valuable support to parents during their absence or offer direct assistance with school-related tasks.

However, it is noteworthy that the average performance of treated and control students in the subsamples who reside with siblings or grandparents is lower than that observed for the full sample (see Table 3). However, this decline is more pronounced among treated individuals, that is, among students cohabiting with both parents and grandparents. Thus, it is plausible to infer that the null effect identified for the treatment is influenced by the negative impact of living in larger families (Kreidl; Hubatková, 2014; Tanskanen; Danielsbacka; Erola, 2016). This finding aligns with literature suggesting a negative correlation between family size and student performance, attributed to the need to dilute family resources in larger families (Blake, 1989; Becker, 1991; Ponczek; Souza, 2012). This hypothesis is reinforced by the null or negative effects found in the subsamples of students living with siblings and grandparents, and among those living with siblings, grandparents, and more.

In summary, the importance of family structure for academic achievement, alongside the impact of larger family settings as emphasized in this study, underscores the pivotal roles of parental involvement and economic opportunities in fostering knowledge acquisition and the accumulation of human capital. Therefore, interventions prioritizing family planning, educational access, and resource accessibility are essential to promote greater equality of opportunities in developing skills that are crucial for future personal and professional success.

Final considerations

The present work aimed to identify the influence of family structure on academic performance by analyzing 5th-grade students in Brazilian public schools in 2019 and applying Propensity Score Matching. This method allowed for more precise results by considering individuals with similar observable characteristics among students from single and two-parent families.

The findings align with existing literature, showing that students from two-parent families achieve higher academic performance in both Portuguese and Mathematics. Specifically, students living with both parents score, on average, approximately 0.15 standard deviations higher in both subjects. These results raise important concerns, as recent trends in family structures in Brazil show a growing prevalence of single-parent households. Given the importance of knowledge and skills, developed through human capital accumulation, as key drivers of productivity and future earnings, this shift in family composition may have long-term implications for poverty reduction and inequality mitigation.

Furthermore, the study explored other factors related to family structure that may influence academic performance. Restrictions were applied to the student sample to investigate the effect of living in two-parent families in various contexts, including students encouraged to study, those with study or reading habits, and those engaged in work or domestic tasks. Additionally, the influence of family structure was examined among students whose households included siblings or grandparents.

The results of this search for heterogeneous effects reveal that, irrespective of context, the average effect of having both parents on academic performance remains consistent. The only exception was observed among students living with their grandparents, where no significant difference in performance was found between those from single- and two-parent households. This null effect is attributed to the negative relationship between family size and academic performance - a phenomenon documented in the literature - due to the forced dilution of family resources in larger families. These results underscore the detrimental effects of single parenthood on children's learning, with potential long-term implications that may affect socioeconomic outcomes in adulthood, including wages and inequality.

In conclusion, family composition emerges as a crucial factor influencing academic performance. This highlights the need to develop strategies to identify and support students facing learning challenges due to their family structure. By enabling their participation in support and assistance programs tailored to stimulate their academic growth, it is possible to enhance their educational outcomes. Efforts to mitigate the adverse effects of single-parent households are essential for fostering greater equality of opportunities in knowledge acquisition and the development of essential skills for personal and professional success.

Acknowledgment

Miriã Garcia Rodrigues acknowledge the financial support given by Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Capes).

References

ALBERTO, M. F. P. *et al.* O trabalho infantil doméstico e o processo de escolarização. **Psicologia & Sociedade**, v. 23, n. 2, 2011.

AMATO, P. R. The impact of family formation change on the cognitive, social, and emotional well-being of the next generation. **The Future of Children**, v. 15, n. 2, p. 75-96, 2005.

AMATO, P. R.; ANTHONY, C. J. Estimating the effects of parental divorce and death with fixed effects models. **Journal of Marriage and Family**, v. 76, n. 2, p. 370-386, 2015.

AMATO, P. R.; DEBOER, D. D. The transmission of marital instability across generations: relationship skills or commitment to marriage? **Journal of Marriage and Family**, v. 63, n. 4, p. 1038-1051, 2001.

AMATO, P. R.; KEITH, B. Parental divorce and the well-being of children: a meta-analysis. **Psychological Bulletin**, v. 110, n. 1, p. 26, 1991.

ASTONE, N. M.; MCLANAHAN, S. S. Family structure, parental practices and high school completion. **American Sociological Review**, v. 56, n. 3, p. 309-320, 1991.

AYLLÓN, S.; FERREIRA-BATISTA, N. N. 'Mommy, I miss daddy'. The effect of family structure on children's health in Brazil. **Economics & Human Biology**, v. 19, p. 75-89, 2015.

BACHMAN, H. J.; COLEY, R. L.; CARRANO, J. **Distinguishing between family structure and family instability on child well-being in low-income families**. Bowling Green: National Center for Family & Marriage Research, 2009. (Working Paper n. 07).

BAI, B. **The effects of family structure on children's education**: an instrumental variable approach. Clemson: Clemson University, 2012.

BECKER, G. S. **A treatise on the family**: enlarged edition. Cambridge: Harvard University Press, 1991.

BECKER, G. S.; LEWIS, H. G. On the interaction between the quantity and quality of children. **Journal of Political Economy**, v. 81, n. 2, 1973.

BECKER, G. S.; TOMES, N. Child endowments and the quantity and quality of children. **Journal of Political Economy**, v. 84, n. 4, 1976.

BECKER, G. S.; TOMES, N. An equilibrium theory of the distribution of income and intergenerational mobility. **Journal of Political Economy**, v. 87, n. 6, p. 1153-1189, 1979.

BECKER, S. O.; CALIENDO, M. Sensitivity analysis for average treatment effects. **The Stata Journal**, v. 7, n. 1, p. 71-83, 2007.

BEZERRA, M. E.; KASSOUF, A. L.; ARENDS-KUENNING, M. **The impact of child labor and school quality on academic achievement in Brazil**. Bonn, Germany: Institute for the Study of Labor (IZA), 2009. (IZA Discussion Papers, nº 4062).

BIBLARZ, T. J.; GOTTANIER, G. Family structure and children's success: a comparison of widowed and divorced single-mother families. **Journal of Marriage and Family**, v. 62, n. 2, p. 533-548, 2000.

BLAKE, I. **Family size and achievement**. Berkeley, CA: University of California Press, 1989.

BZOSTEK, S. H.; BERGER, L. M. Family structure experiences and child socioemotional development during the first nine years of life: examining heterogeneity by family structure at birth. **Demography**, v. 54, n. 2, p. 513-540, 2017.

CALIENDO, M.; KOPEINIG, S. **Some practical guidance for the implementation of propensity score matching**. 2010. Tese (Doutorado em Economia) – Universidade de Köln, 2010.

CARLSON, M. J.; CORCORAN, M. E. Family structure and children's behavioral and cognitive outcomes. **Journal of Marriage and Family**, v. 63, n. 3, p. 779-792, 2001.

CID, A.; STOKES, C. E. Family structure and children's education outcome: evidence from Uruguay. **Journal of Family and Economic Issues**, v. 34, n. 2, p. 185-199, 2013.

CONLISK, J. Can equalization of opportunity reduce social mobility? **The American Economic Review**, v. 64, n. 1, p. 80-90, 1974.

COUTRIM, R. M. E.; BOROTO, I. G.; VIEIRA, L. C.; MAIA, I. O. O que os avós ensinam aos netos? A influência da relação intergeracional na educação formal e informal. In: XIII CONGRESSO BRASILEIRO DE SOCIOLOGIA. **Anais** [...]. Recife-PE: Sociedade Brasileira de Sociologia, 2007.

CUNHA, F.; HECKMAN, J. J.; LOCHNER, L. J.; MASTEROV, D. V. Interpreting the evidence on life cycle skill formation. *In*: HANUSHEK, E. A.; WELCH, F. (Org.). **Handbook of economics of education.** Amsterdam: North Holland, v. 1, 2006.

DEL BONO, E. *et al.* Early maternal time investment and early child outcomes. **The Economic Journal**, v. 126, n. 596, p. f96-f135, 2016.

DIPRETE, T. A.; GANGL, M. Assessing bias in the estimation of causal effects: Rosenbaum bounds on matching estimators and instrumental variables estimation with imperfect instruments. **Sociological Methodology**, v. 34, n. 1, p. 271-310, 2004.

DOWNEY, D. B. The school performance of children from single-mother and single-father families: economic or interpersonal deprivation? **Journal of Family Issues**, v. 15, p. 129-147, 1994.

DRONKERS, J. The effects of parental conflicts and divorce on the well-being of pupils in Dutch secondary education. **European Sociological Review**, v. 15, p. 195-212, 1999.

EMERSON, P. M.; PONCZEK, V.; SOUZA, A. P. Child labor and learning. **Economic Development and Cultural Change**, v. 65, n. 2, p. 265-296, 2017.

ENTWISLE, D. R.; ALEXANDER, K. L. A parent's economic shadow: family structure versus family resource as influences on early school achievement. **Journal of Marriage and Family**, v. 57, n. 2, p. 399-409, 1995.

FRISCO, M. L.; MULLER, C.; FRANK, K. Parents' union dissolution and adolescents' school performance: comparing methodological approaches. **Journal of Marriage and Family**, v. 69, p. 721-741, 2007.

GERTLER, P. J.; MARTINEZ, S.; PREMAND, P.; RAWLINGS, L. B.; VERMEERSCH, C. M. **Impact evaluation in practice**. 2. ed. Washington, DC: The World Bank Publications, 2016.

HANUSHEK, E. A. The trade-off between child quantity and quality. **The Journal of Political Economy**, v. 100, n. 1, p. 84-117, 1992.

HASTINGS, O. P.; SCHNEIDER, D. Family structure and inequalities in parents' financial investment in children. **Journal of Marriage and Family**, v. 83, n. 3, p. 717-736, 2021.

HECKMAN, J. J. Role of income and family influence on child outcomes. **Annals of the New York Academy of Sciences**, v. 1136, p. 307-323, 2008.

HECKMAN, J. J.; LOCHNER, L.; TABER, C. Explaining rising wage inequality: explorations with a dynamic general equilibrium model of labor earnings with heterogeneous agents. **Review of Economic Dynamics**, v. 1, n. 1, p. 1-58, 1998.

HETHERINGTON, E. M.; CLINGEMPEEL, W. G.; ANDERSON, E. R.; DEAL, J. E.; HAGAN, M. S.; HOLLIER, E. A.; BENNION, L. D. Coping with marital transitions: a family systems perspective. **Monographs of the Society for Research in Child Development**, v. 57, n. 2-3, 1992.

HOFFERTH, S. L.; GOLDSCHEIDER, F. Family structure and the transition to early parenthood. **Demography**, v. 47, n. 2, p. 415-437, 2010.

HOLMLUND, H.; NYBOM, M. **Education and social mobility**. IFAU – Institute for Evaluation of Labour Market and Education Policy, 2023. Available in: ‹https://www.ifau.se/globalassets/pdf/se/2023/r-2023-18-Education-and-social-mobility.pdf›. Access in: May 2023.

HUSSEY, A.; KANJILAL, D.; NATHAN, A. Disruption in parental co-habitation and its effects on short-term, medium-term, and long-term outcomes of adolescents. **Journal of Family and Economic Issues**, v. 37, p. 58-74, 2016.

HSIN, A.; FELFE, C. When does time matter? Maternal employment, children's time with parents, and child development. **Demography**, v. 51, n. 5, p. 1867-1894, 2014.

IBGE – Instituto Brasileiro de Geografia e Estatística. **Censo Demográfico 2022**: composição domiciliar e óbitos informados. Resultados do universo. Rio de Janeiro: IBGE, 2024.

INEP – Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira. **Indicador de adequação da formação do docente da educação básica**. Nota técnica nº 20/2014. Brasília, DF: Inep, 2014. Available in: https://www.gov.br/inep/pt-br/acesso-a-informacao/dados-abertos/indicadores-educacionais/adequacao-da-formacao-docente. Access in: May 2023.

INEP – Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira. **Saeb 2019**: indicador de nível socioeconômico do Saeb 2019. Nota técnica. Brasília, DF: Inep, 2021. Available in: https://www.gov.br/inep/pt-br/acesso-a-informacao/dados-abertos/indicadores-educacionais/nivel-socioeconomico. Access in: May 2023.

JEYNES, H. W. Effects of parental involvement and family structure on the academic achievement of adolescents. **Journal of Marriage & Family Review**, v. 37, n. 3, 2005.

JEYNES, W. **Divorce, family structure, and the academic success of children**. Routledge, 2012.

JEYNES, W. H. Effects of family educational cultures on student success at school: directions for leadership. *In*: LEITHWOOD, K.; SUN, J.; POLLOCK, K. (Ed.). **How school leaders contribute to student success**: the four paths framework. Springer, 2017. p. 311-328.

JOLLIFFE, I. T. **Principal component analysis**. 2. ed. New York, NY: Springer, 2002.

KOEPP, A. E.; GERSHOFF, E. T.; MARTELETO, L. J. Parent involvement and children's academic achievement: evidence from a census of public-school students in Brazil. **Child Development**, v. 93, n. 6, p. 1744-1759, 2022.

KHANDKER, S. R.; KOOLWAL, G. B.; SAMAD, H. A. **Handbook on impact evaluation**: quantitative methods and practices. World Bank Publications, 2010.

KREIDL, M.; HUBATKOVA, B. Does coresidence with grandparents reduce the negative association between sibship size and reading test scores? **Research in Social Stratification and Mobility**, v. 38, p. 1-17, 2014. DOI: 10.1016/j.rssm.2014.04.001.

LEIBOWITZ, A. Home investments in children. **Journal of Political Economy**, v. 82, n. 2, 1974.

LI, J. A. **The kids are OK**: divorce and children's behavior problems. RAND Labor and Population, 2007. (Working Paper, n. 489).

LIMA, L.; SANTOS, D. D. Pai importa? O efeito da presença paterna sobre o desempenho escolar. *In*: XLIII ENCONTRO NACIONAL DE ECONOMIA. **Anais** [...]. Associação Nacional dos Centros de Pós-Graduação em Economia, 2016.

LIMA, L. D. E.; CARVALHO, A. A. D.; SILVA, D. B. D. N. Arranjos familiares e desempenho escolar de alunos do 5º e 9º anos no Brasil em 2015. **Revista Brasileira de Estudos de População**, v. 38, e0142, 2021.

LEONE, E. T.; MAIA, A. G.; BALTAR, P. E. Mudanças na composição das famílias e impactos sobre a redução da pobreza no Brasil. **Economia e Sociedade**, v. 19, n. 1 (38), p. 59-77, 2010.

MACANA, C. E. *et al.* Pais engajados, filhos dedicam mais tempo aos estudos? Uma análise dos fatores associados ao engajamento dos estudantes da rede pública brasileira nas atividades durante a pandemia do Covid-19. *In*: 49º ENCONTRO NACIONAL DE ECONOMIA. **Anais** [...]. Anpec – Associação Nacional dos Centros de Pós-Graduação em Economia, 2021.

MACANA, C. E. *et al.* Perfis de estudantes e fatores associados para sua adaptação ou risco de abandono escolar durante o ensino remoto na pandemia do Covid-19. *In*: 50º ENCONTRO NACIONAL DE ECONOMIA. **Anais** [...]. Anpec – Associação Nacional dos Centros de Pós-Graduação em Economia, 2022.

MACHADO, D. C.; GONZAGA, G. O impacto dos fatores domiciliares sobre a defasagem idade-série de crianças no Brasil. **Revista Brasileira de Economia**, v. 61, n. 4, p. 449-476, 2007.

MAIA, A. G.; SAKAMOTO, C. S.. The impacts of rapid demographic transition on family structure and income inequality in Brazil, 1981-2011. **Population Studies**, v. 70, n. 3, p. 293-309, 2016.

MARTINS, J. C.; TEIXEIRA, E. C. As estruturas familiares afetam o desempenho escolar no Brasil? **Revista Econômica do Nordeste**, v. 52, n. 1, p. 65-76, 2021.

MATA, L.; MONTEIRO, V. O desenvolvimento da motivação para a leitura em crianças portuguesas. *In*: VIII CONGRESSO GALAICO-PORTUGUÊS DE PSICOPEDAGOGIA. **Actas** [...]. Braga: Cied – Centro Interdisciplinar de Estudos Educacionais, 2005.

MCLANAHAN, S.; PERCHESKI, C. Family structure and the reproduction of inequalities. **Annual Review of Sociology**, v. 34, p. 257-276, 2008.

MCLANAHAN, S. S.; SANDEFUR, G. **Growing up with a single parent**: what hurts, what helps? Cambridge, MA: Harvard University Press, 1994.

MCLANAHAN, S. S.; TACH, L.; SCHNEIDER, D. The causal effects of father absence. **Annual Review of Sociology**, v. 39, p. 399-427, 2013.

MENEZES-FILHO, N. A. Os determinantes do desempenho escolar do Brasil. *In*: DELFIM NETTO, A. (Coord.). **O Brasil e a ciência econômica em debate**. São Paulo: Saraiva, v. 1, 2012;

NUSSBAUM, M. C. **Creating capabilities**: the human development approach. Cambridge, MA: Harvard University Press, 2011.

ORAZEM, P.; GUNNARSSON, V. **Child labour, school attendance and performance**: a review. Iowa State University Department of Economics, 2004. (Working Paper, n. 4001).

OSBORNE, C.; BERGER, L. M.; MAGNUSON, K. Family structure transitions and changes in maternal resources and well-being. **Demography**, v. 49, n. 1, p. 23-47, 2012.

PEÑALOZA, R. H. *et al.* Does the family structure affect the health risk behavior of Brazilian adolescents? **Brazilian Review of Econometrics**, v. 42, n. 1, 2022.

PONCZEK, V.; SOUZA, A. P. New evidence of the causal effect of family size on child quality in a developing country. **Journal of Human Resources**, v. 47, n. 1, p. 64-106, 2012.

PONG, S. L.; DRONKERS, J.; THOMPSON, G. H. Family policies and children's school achievement in single versus two-parent families. **Journal of Marriage and Family**, v. 65, n. 3, p. 681-699, 2003.

RASMUSSEN, A. W. **Family structure changes and children's health, behavior, and educational outcomes**. Aarhus: Aarhus University, Department of Economics, 2009. (Working Paper, n. 15).

RODRIGUES, J. D. C. **Educação infantil e capital humano**: o efeito da creche e pré-escola no desempenho acadêmico futuro de alunos brasileiros. Monografia (Graduação em Economia) – Departamento de Economia, PUC-RJ, Rio de Janeiro, 2017.

ROSENBAUM, P.; RUBIN, D. B. The central role of the propensity score in observational studies for causal effects. **Biometrika**, v. 70, p. 41-55, 1983.

ROSENBAUM, P. R. **Observational studies**. 2. ed. New York: Springer, 2002.

SABINO, M. M. C. Importância educacional da leitura e estratégias para sua promoção. **Revista Iberoamericana de Educación**, v. 45, n. 5, p. 1-11, 2008.

SILVA, N.; ROUSSEAU, M.; DESLANDES, R. Participação dos pais e mães na realização da lição de casa no Quebec e no Brasil. **Revista Eletrônica Acolhendo a Alfabetização nos Países de Língua Portuguesa**, v. 4, p. 72-101, 2010.

SIMONS, R. L. **Understanding differences between divorced and intact families**: stress, interaction, and child outcome. Sage Publications, Inc., 1996.

STRAPAZZON, I. C.; FRANÇA, M. T. A.; FRIO, G. S. Family structure and the performance of Brazilian students: an analysis using the Oaxaca-Ransom methodology with SAEB 2019 Data. **International Journal of Educational Development**, v. 115, 2025.

TANSKANEN, A. O.; DANIELSBACKA, M. J. E.; EROLA, J. **Grandparental co-residence, parental involvement, and educational outcomes among children**. Turku Center for Welfare Research, 2016. (Working Papers on Social and Economic Issues, n. 13). Available in: https://researchportal.helsinki.fi/files/123982124/WPSEI_2016_13_TanskanenEtAl_3.pdf. Access in: mai. 2024.

TERRA, T. M. S.; HERMETO, A. M. Dinâmica das assimetrias na distribuição de renda segundo os arranjos familiares no Brasil. **Relap – Revista Latinoamericana de Población**, v. 18, 2024. https://doi.org/10.31406/relap2024.v.18e202419.

THOMSON, E.; MCLANAHAN, S. S.; CURTIN, R. B. Family structure, gender, and parental socialization. **Journal of Marriage and the Family**, p. 368-378, 1992.

UMBERSON, D.; THOMEER, M. B. Family matters: research on family ties and health, 2010 to 2020. **Journal of Marriage and Family**, v. 82, n. 1, p. 404-419, 2020.

About the authors

Miriã Rodrigues Garcia is Master in Applied Economics (FURG). Ph.D. candidate in Applied Economics (UFPel).

Eduardo Tillmann is Ph.D. in Applied Economics (UFRGS). Professor at the Federal University of Rio Grande (FURG).

Contact address

Miriã Rodrigues Garcia
Universidade Federal de Pelotas, Programa de Pós-Graduação em Organizações e Mercados
Rua Gomes Carneiro, n. 1 – *campus* Anglo/ 4º andar
96010-610 – Pelotas-RS, Brazil

Eduardo Tillmann
Universidade Federal do Rio Grande
Av. Itália, km 8, Bairro Carreiros, UPEC/ Anexo Prédio 4
96203-900 – Rio Grande-RS, Brazil

CRediT

Funding: Not applicable.
Conflicts of interest: The authors certify that they have no personal, commercial, academic, political or financial interest that represents a conflict of interest in relation to the manuscript.
Ethical Approval: The authors declare that the study did not include human beings or animals.
Availability of data and material: The content is already available (public data).
Authors' contributions:
Miriã Rodrigues Garcia: conceptualization, visualization, data curation, methodology, investigation, formal analysis, validation, and writing – original draft.
Eduardo Tillmann: conceptualization, visualization, project, supervision and writing – review and editing.
Editors: Bernardo Lanza Queiroz, Júlia Almeida Calazans and Maria Carolina Tomas

Resumo

Influência da composição familiar no desempenho acadêmico

Este estudo tem como objetivo investigar a influência causal da estrutura familiar no desempenho acadêmico de alunos do 5º ano do ensino fundamental, além de explorar fatores adicionais que podem impactar essa relação. Para alcançar esse objetivo, é utilizada a metodologia de Propensity Score Matching, com base nos dados do Sistema de Avaliação da Educação Básica (Saeb) de 2019. Os resultados demonstram uma diferença positiva significativa no desempenho acadêmico entre os alunos que residem em lares biparentais em comparação àqueles que vivem com apenas um dos pais. Independentemente dos contextos socioeconômicos, o impacto positivo de ter ambos os pais presentes no desempenho acadêmico permanece consistente. A exceção é observada quando os avós também residem com os estudantes, evidenciando uma possível competição por recursos e as desvantagens socioeconômicas frequentemente associadas a domicílios multigeracionais. Portanto, este estudo ressalta o papel crítico da composição familiar na formação do desempenho escolar, enfatizando a importância de implementar estratégias voltadas para mitigar os efeitos adversos das estruturas familiares monoparentais nos resultados de aprendizagem, visto que estes podem influenciar uma ampla gama de resultados socioeconômicos futuros.

Palavras-chave: Educação fundamental. Realização acadêmica. Família monoparental. Família biparental.

Resumen

Influencia de la composición familiar en el rendimiento académico

Este estudio tiene como objetivo investigar la influencia causal de la estructura familiar en el rendimiento académico de los estudiantes de quinto grado de primaria, además de explorar factores adicionales que puedan impactar en esta relación. Para lograr este objetivo, se utiliza la metodología de Propensity Score Matching, basada en datos del Sistema de Evaluación de la Educación Básica (SAEB) de 2019. Los resultados muestran una diferencia positiva significativa en el rendimiento académico entre los estudiantes que residen en hogares biparentales en comparación con aquellos que viven con solo uno de los progenitores. Independientemente de los contextos socioeconómicos, el impacto positivo de tener ambos padres presentes en el rendimiento académico permanece consistente. La excepción se observa cuando los abuelos también residen con los estudiantes, lo que evidencia una posible competencia por recursos y las desventajas socioeconómicas asociadas con frecuencia a los hogares multigeneracionales. Por lo tanto, este estudio subraya el papel crítico de la composición familiar en la formación del rendimiento escolar, enfatizando en la importancia de implementar estrategias destinadas a mitigar los efectos adversos de las estructuras familiares monoparentales en los resultados de aprendizaje, ya que estos pueden influir en una amplia gama de resultados socioeconómicos futuros.

Palabras clave: Educación primaria. Rendimiento académico. Familia monoparental. Familia biparental.

Received for publication in 10/06/2024
Approved for publication in 22/05/2025

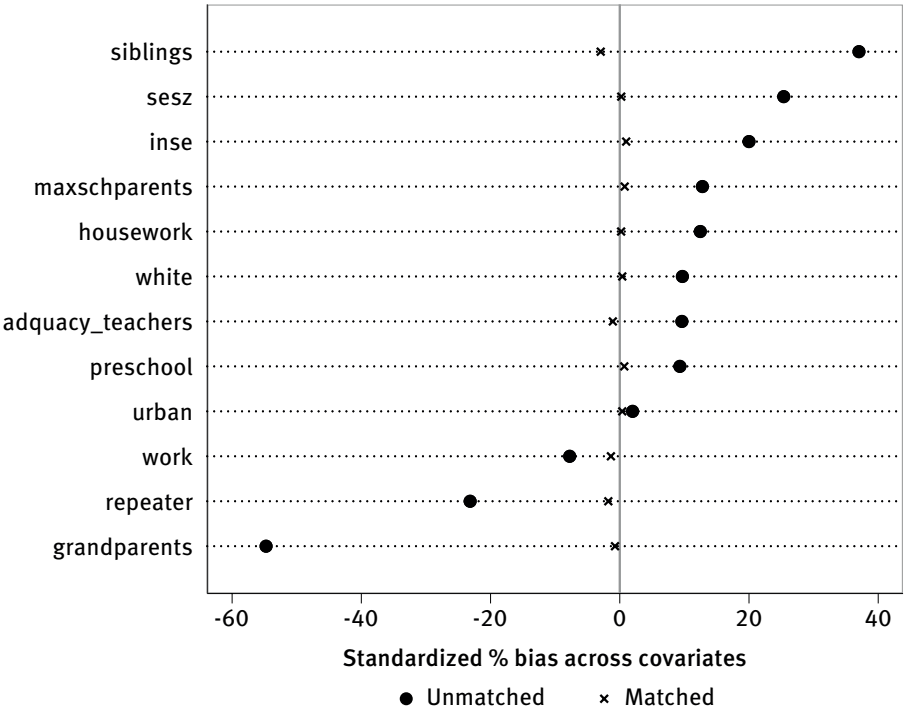
APPENDIX

TABLE 1
Rosenbaum bounds sensitivity tests for heterogeneous effects

Parental engagement	
Mathematics – Nearest neighbor	1.4
Portuguese – Nearest neighbor	1.4
Study habit	
Mathematics – Nearest neighbor	1.5
Portuguese – Nearest neighbor	1.4
Reading habit	
Mathematics – Nearest neighbor	1.4
Portuguese – Nearest neighbor	1.4
Works	
Mathematics – Nearest neighbor	1.4
Portuguese – Nearest neighbor	1.3
Household chores	
Mathematics – Nearest neighbor	1.4
Portuguese – Nearest neighbor	1.3
Reside with siblings	
Mathematics – Nearest neighbor	1.3
Portuguese – Nearest neighbor	1.3
Reside with grandparents	
Mathematics – Nearest neighbor	1.0
Portuguese – Nearest neighbor	1.0
Reside with siblings and grandparents	
Mathematics – Nearest neighbor	1.0
Portuguese – Nearest neighbor	1.0
Reside with siblings, grandparents and others	
Mathematics – Nearest neighbor	1.1
Portuguese – Nearest neighbor	1.2

Source: Inep. Sistema de Avaliação da Educação Básica (2019). Elaboration of the authors.
Note: The maximum value of gamma () in Rosenbaum bounds test considering a statistical significance level of 5%. This test indicates the highest critical value for which the average treatment effect on the treated remains statistically different from zero.

FIGURE 1
Quality of matching fit after propensity score matching



Source: Inep. Sistema de Avaliação da Educação Básica (2019). Elaboration of the authors.