SOCIOECONOMIC INEQUALITIES AND ACADEMIC PERFORMANCE: ANALYSIS OF SAEB/BRAZIL AND SIMCE/CHILE RESULTS IN 2019

DESIGUALDADES SOCIOECONÔMICAS E DESEMPENHO ESCOLAR: ANÁLISE DOS RESULTADOS DO SAEB/BRASIL E DO SIMCE/CHILE EM 2019

DESIGUALDADES SOCIOECONÓMICAS Y RENDIMIENTO ACADÉMICO: ANÁLISIS DE LOS RESULTADOS DE SAEB/BRASIL Y SIMCE/CHILE EN 2019

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How to reference this paper:

SOARES, D. J. M.; SOARES, T. E. A.; RÍOS-MUÑOZ, D. SANTOS, W. Socioeconomic inequalities and academic performance: analysis of SAEB/Brazil and SIMCE/Chile results in 2019. **Nuances: Estudos sobre Educação**, Presidente Prudente, v. 35, n. 00, e024006, 2024. e-ISSN: 2236-0441. DOI: https://doi.org/10.32930/nuances.v35i00.10410

| **Submitted**: 23/04/2024
| **Revisions required**: 24/06/2024
| **Approved**: 07/07/2024
| **Published**: 06/08/2024

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ABSTRACT: This paper was developed with the aim of analyzing the influence of socioeconomic factors on students' academic performance in standardized assessments administered by the Sistema de Avaliação da Educação Básica in Brazil and the pelo Sistema de Medición de la Calidad de la Educación in Chile. This is a comparative mixed methods research with a sequential exploratory perspective, predominantly quantitative, which uses official data obtained through queries to the electronic portals of both countries. The results confirm the association between students' socioeconomic status and their academic success, with a stronger emphasis on the intensity of this relationship in the most extreme socioeconomic categories. This highlights the pressing need to develop innovative strategies to balance academic performance expectations among students from different social backgrounds. This challenge becomes even more significant in light of the ongoing educational changes in both countries, particularly the reforms in their academic assessment systems.

KEYWORDS: Education and inequalities. Socioeconomic level. Evaluation of educational systems.

***RESUMO**: Este artigo objetiva analisar a influência do fator socioeconômico no desempenho escolar dos estudantes nas avaliações padronizadas aplicadas pelo Sistema de Avaliação da Educação Básica, no Brasil, e pelo Sistema de Medición de la Calidad de la Educación, no Chile. Trata-se de uma pesquisa comparada de método misto com perspectiva exploratória sequencial, majoritariamente quantitativa, que utiliza dados oficiais obtidos mediante consultas aos portais eletrônicos de ambos os países. Os resultados corroboram a associação entre o status socioeconômico dos estudantes e seu sucesso escolar, com maior intensidade nas categorias socioeconômicas extremas, tanto no Brasil quanto no Chile. Isso ressalta a necessidade premente de desenvolver estratégias inovadoras para equilibrar as expectativas de desempenho acadêmico entre alunos de diferentes origens sociais. Esse desafio se torna ainda mais significativo em face das atuais mudanças educacionais em curso em ambos os países, com especial destaque para as reformas em seus sistemas de avaliação educacional.*

***PALAVRAS-CHAVE**: Educação e desigualdades. Nível socioeconômico. Avaliação de sistemas educacionais.*

***RESUMEN**: Este artículo analiza la influencia del factor socioeconómico en el rendimiento escolar de los estudiantes en las evaluaciones estandarizadas aplicadas por el Sistema de Evaluación de la Educación Básica en Brasil y por el Sistema de Medición de la Calidad de la Educación en Chile. Se trata de una investigación comparativa de método mixto con una perspectiva exploratoria secuencial, predominantemente cuantitativa, que utiliza datos oficiales obtenidos mediante consultas a los portales electrónicos de ambos países. Los resultados confirman la asociación entre el estatus socioeconómico de los estudiantes y su éxito escolar, especialmente entre las categorías socioeconómicas más extremas. Esto destaca la necesidad urgente de desarrollar estrategias innovadoras para equilibrar las expectativas de rendimiento académico entre estudiantes de diferentes orígenes sociales. Este desafío se vuelve aún más significativo frente a los actuales cambios educativos en curso en ambos países, con especial énfasis en las reformas en sus sistemas de evaluación educativa.*

***PALABRAS CLAVE**: Educación y desigualdades. Nivel socioeconómico. Evaluación de sistemas educativos.*

Introduction

At the beginning of the 20th century, researchers from the United States and England began to develop studies aiming to link socioeconomic processes with the values and knowledge transmitted through education. According to Alves, Soares, and Xavier (2014), from the 1950s onward, these studies were boosted by the development of specialized computer software, which supported the application of more robust statistical techniques to population data.

Since then, the debate on the impacts of students' socioeconomic and cultural characteristics on their academic outcomes has gained increasing prominence in various countries, particularly following the publication of the Coleman Report (Coleman, 1966). This document, based on an empirical study involving over five hundred thousand American students enrolled in primary and secondary education, indicated that students' academic performance was closely related to their socioeconomic status (SES).

Literature developed in the Latin American context also highlights the significance of this factor in the educational outcomes of children and adolescents from the region's countries, such as Argentina (Quiroz; Dari; Cervini, 2018; Azar; Filippetti; Rubilar, 2019); Colombia (Caicedo-Reyes; Silva-Arias, 2021; Duque; Pernía, 2021); Mexico (Linares; Maldonado, 2019; Cristerna; Cuéllar; Zúñiga, 2020); Peru (Muelle, 2020; Murillo; Carrillo, 2021), among others.

In Brazil, there is also a noticeable equitable movement among researchers to confirm this hypothesis. However, many of them have used regional samples as units of analysis, which limits the ability to draw more comprehensive conclusions (Matias, 2018; Ernica; Rodrigues, 2020; Santos, 2021), which can be attributed to the country's continental dimension and its diverse economic, social, and cultural realities. In the Chilean context, it is common to find studies highlighting the influence of socioeconomic factors on the performance of higher education students (Janzen; González-García; García-Olguín, 2020; Rodríguez-Fernández *et al.,* 2020) or in primary and secondary education, using international assessments such as the Programme for International Student Assessment (PISA) as objects of analysis (Ascorra, 2016; Villalobos; Wyman; Treviño, 2020).

However, both countries have established education assessment systems that have guided public management through the results achieved by evaluated institutions. In Chile, the System for *Medición de la Calidad de la Educación* (Simce) was created in 1988 with the primary aim of contributing to the improvement of education quality and equity by reporting students' learning outcomes and relating them to the educational and social context in which

they are situated (Chile, 2021). In Brazil, the Basic Education Assessment System (SAEB) was established in 1993 with the main purpose of diagnosing Brazilian primary and secondary education by analyzing factors that may affect student performance (Brasil, 2021).

To enrich the debate on the impact of socioeconomic factors on students' academic performance, this study aims to analyze how this phenomenon manifests in the standardized assessments administered by Simce/Chile and SAEB/Brazil. Accordingly, it seeks to answer the following central question: What is the extent of the influence of socioeconomic factors on students' academic performance in these assessments, considering the 2019 edition, and how does this influence manifest across different socioeconomic categories?

To conduct this analysis, the following specific objectives were established: a) to characterize the assessment systems in Chile and Brazil, emphasizing their approaches and educational outcomes; b) to describe the results obtained by educational institutions in these systems, based on indicators related to the socioeconomic level of students; and c) to correlate these variables and, if statistically significant, evaluate the magnitude of the association.

The choice of countries for this comparative study is based on their distinct socioeconomic and cultural characteristics, which provides an opportunity to explore how socioeconomic variables might affect academic performance differently across various contexts. Moreover, both countries have well-established educational assessment systems, global relevance, and the potential for significant contribution to understanding the influence of socioeconomic factors on students' academic performance, in addition to their commitment to transparency in their assessment processes.

The article is structured into five sections. In addition to the introduction, the second and third sections present the conceptual and methodological frameworks, respectively, that underpin this investigation. Following this, the results of the analyses are highlighted, accompanied by a discussion. The article concludes with the final considerations derived from the study.

Conceptual Framework

Educational assessments organized by external agents, known as external assessments, have become the primary tool used to inform decision-making in educational policies, guiding educational systems worldwide. Typically, these assessments are applied on a large scale,

meaning they have broad and extensive reach. Consequently, terms such as large-scale external assessments or standardized assessments (Orfield; Wald, 2000) are commonly used.

For its conceptual delimitation, as expressed by Orfield and Wald (2000), it is necessary to consider that these assessments are categorized according to their nature (based on their scope), their purposes (based on their objectives), and their effects (considering the impact they have on decision-making in the school environment). Among these, assessments with high-stakes effects are those that link "[...] the scores from a set of standardized tests to grade promotion, high school graduation, and in some cases, to the teacher and principal" (Orfield; Wald, 2000, p. 38, our translation). Consequently, their results can directly affect the individuals involved in the daily school environment. Conversely, low-stakes exams do not have direct effects on students' educational trajectories or teachers' careers but may provide elements to support public policies in the educational context.

Based on these concepts and the specific characteristics of the Chilean and Brazilian assessment systems, the theoretical contributions of Bloch (1998; 2001) are initially adopted in analyzing official sources and the comparative study between these systems (Simce/Chile and Saeb/Brazil). According to the author, the use of comparative studies in the humanities is equivalent to "[...] seeking to explain the similarities and differences observed in analogous series drawn from different social contexts" (Bloch, 1998, p. 114, , our translation). This approach allows for the identification of specificities, similarities, and/or divergences, focusing on the political culture (Bernstein, 1998; Motta, 2009) underpinning the assessment systems in both countries.

Furthermore, considering the socioeconomic factor as a complex and dynamic field of investigation, often marginalized in the analysis of educational products generated by standardized tests, this study seeks "clues" that lead to an understanding of how it influences students' academic performance in both countries and reveals its implications for Brazilian and Chilean education. Building on this, and through the contributions of Pierre Bourdieu's critical-reproductive theory, the aim is to understand the role of the school in the reproduction and legitimation of social inequalities.

Bourdieu and his collaborators argue that for each individual, there is an association between their social origin and the conceptual triad of field, habitus, and capital. In essence, Bourdieu's theory is based on the principle that social dynamics occur within a field—a social segment where power relations manifest, and specific forms of capital are distributed. This field

is organized at two extremes, with the dominant classes possessing greater amounts of capital and the dominant classes.

According to the author, habitus is "[...] a system of durable and transferable dispositions that, integrating all past experiences, functions at every moment as a matrix of perceptions, appreciations, and actions" (Bourdieu, 1983, p. 65, our translation). Thus, it involves the internalization of a particular socioeconomic and cultural structure by individuals, influencing their actions, even unconsciously. Furthermore, individuals belonging to the same end of the field possess similar habitus. The predominant factor determining an individual's specific position is the amount and structure of capital they hold.

Bourdieu's notion of capital is derived from Marxist theory and focuses on "[...] the determinacy of economic structures as a way to establish individual conduct" (Madeira, 2007, p. 20, our translation). According to Bourdieu, there are essentially three main types of capital: a) economic capital, which includes material goods, income, and possessions; b) social capital, which consists of social relationships that can be capitalized; and c) cultural capital, which, beyond academic qualifications, refers to the skills or knowledge that distinguish individuals.

From Bourdieu's perspective, the amount of capital an individual possesses, combined with the habitus acquired since childhood and aligned with the end of the field to which they belong, are determining factors for their success. Thus, the educational system, understood as a field, is one of the most effective elements of social preservation, reproducing social inequalities and being less favorable to the most vulnerable students. In other words, Bourdieu's theory argues that the school cannot compete with the strong influence of family background, having a limited effect on student learning (Bourdieu; Passeron, 2012; Bourdieu, 1989; 1998; 2007).

Methodological Framework

Approach

This is a comparative study using a mixed-method approach with a sequential exploratory perspective, predominantly quantitative (Creswell; Clark, 2015). Initially, documentary research is conducted to provide a comprehensive overview[5] of the relationships

[5] Documentary research in qualitative analysis, according to Kripka, Scheller, and Bonotto (2015, p. 58, our translation), "[...] is one in which the data obtained comes strictly from documents, with the aim of extracting information contained therein, in order to understand a phenomenon".

between the variables under study. This is followed by a quantitative phase, involving descriptive statistical analyses, correlation, and cross-sectional analysis[6].

Units of Analysis

For the proposed qualitative analysis, which aims to examine the similarities between Simce/Chile and SAEB/Brazil, governmental documents are used as the units of analysis. These documents were produced to regulate and guide the actions of the Brazilian and Chilean governments in relation to the educational assessment policies adopted in both countries. These documents are described in Chart 1.

Chart 1 – Normative Documents Used in the Analysis

	Year	Document	Summary
Brazil	1994	Ordinance No. 1,795 of December 27, 1994	Creates the Basic Education Assessment System (SAEB)
	1996	Law No. 9,934 of December 20, 1996	Law of Guidelines and Bases for National Education (LDB)
	2013	Ordinance No. 482 of June 7, 2013	Provides for the Basic Education Assessment System (SAEB)
	2017	Ordinance No. 564 of April 19, 2017	Amends MEC Ordinance No. 482, which provides for the Basic Education Assessment System (Saeb)
	2020	Ordinance No. 458 of May 5, 2020	Institutes complementary standards necessary for compliance with the National Policy for the Assessment of Basic Education
Chile	1990	Law No. 18,962 of March 18, 1990	Constitutional Organic Law of Education (LOCE)
	2009	Law No. 20,370 of September 12, 2009	Institutes the General Law of Education
	2011	Law No. 20,529 of August 11, 2011	Institutes the National System for Quality Assurance of Preschool, Basic and Secondary Education and its Supervision
	2016	Decree No. 18 of June 20, 2016	Establishes the National Plan for National and International Assessments for the Period 2016 – 2020

Source: Prepared by the authors.

The quantitative analyses, in turn, utilize two social stratum indicators as units of analysis. These indicators were developed from questionnaires administered alongside the assessments that are part of the respective systems, aiming to contextualize the learning measures. These indicators are: the Socioeconomic Status Indicator (INSE) in Brazil and the socioeconomic group classification (GSE) in Chile. The INSE/Brazil was created in 2014 by the Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira (INEP) (Brasil,

[6] This type of design allows for the instant visualization of a population, enabling the first moment of analysis of an association (Rouquayrol; Almeida Filho, 2006).

2014). The GSE/Chile was developed by the *Agencia de Calidad de la Educación* (ACE) of the Chilean government (Chile, 2003).

These indicators consider information about monthly household income (related to economic capital in Bourdieu's theory), as well as the educational level of the student's parents, ownership of household goods, and hiring of services (related to cultural capital in Bourdieu's theory), obtained from the contextual questionnaires administered. Additionally, the GSE/Chile also includes a vulnerability index (IVE), developed by the Junta Nacional de A*uxilio Escolar y Beca* (JUNAEB) within the Chilean School Feeding Program (PAE).

For the analyses of student academic performance, the educational results obtained in 2019 by schools in both countries on their respective assessments were considered. As only Portuguese Language and Mathematics were assessed in Brazil, the analysis in Chile was restricted to the subjects of Language and Communication (focusing on Reading) and Mathematics, excluding the Social Sciences assessment that was also included in that edition.

Additionally, due to the protests that occurred in Chile in October 2019, known as the "social explosion," only the 8th grade was assessed, which corresponds to the final stage of primary education in the country. Therefore, for the Brazilian context, the analysis focused on the 9th grade, which corresponds to the final stage of elementary education here. Thus, the initial population analyzed consists of 5,953 Chilean primary education institutions and 36,855 Brazilian institutions offering the final years of elementary education.

Data Collection Techniques

The normative documents and microdata used in the analyses were obtained through consultations with the electronic portals of the Ministries of Education of Brazil and Chile, conducted in the second half of 2021. For the quantitative analyses, a cross-reference was performed between the information on the socioeconomic indicators used in each country (GSE/Chile and INSE/Brazil) and the performance of educational institutions in the respective assessments applied by their educational systems (Simce/Chile and SAEB/Brazil). The 2019 edition was considered, as it was the most recent with available data at the time of the study.

Data Analysis

The documentary analysis was defined as the initial methodological strategy, conducted through exploratory research via consultation of the normative documents listed in Table 1, to gather the critical information necessary for the comparative study between Simce/Chile and

SAEB/Brazil. Thus, considering both countries, information was investigated regarding: the context of the creation of the educational assessment systems; the conception of quality in education assumed; the statistical techniques adopted for measuring learning; and the future perspectives on evaluation.

The quantitative data analysis involved grouping the proficiency levels obtained from the assessments that are part of the respective systems, for each evaluated subject, according to their distribution in quartiles. For each constituted group, the frequency distribution by previously established socioeconomic levels was also obtained, based on the classification derived from the investigated indicators. In the case of INSE/Brazil, this process occurs in seven ordinal levels: very low, low, medium-low, medium, medium-high, high, and very high. For GSE/Chile, only the extreme categories are excluded, resulting in five levels. In both cases, the categorization process was performed using cluster analysis (K-means). Generally, the higher the group, the greater the concentration of students with higher socioeconomic status in the school.

Based on this cross-referencing of information and aiming to investigate a possible correlation between socioeconomic status (SES) and academic performance, descriptive and inferential analyses were conducted through the construction of contingency tables and the Chi-Square Test of Independence. This hypothesis test is non-parametric and aims to analyze the association between categorical variables by comparing observed and expected frequencies for a given event. The null hypothesis (Ho) of the test posits that there are no statistically significant differences between the variables (Everitt, 1992).

Additionally, to assess the magnitude of this association, the Cramér's V coefficient and standardized adjusted residuals (SARs) were used. The Cramér's V coefficient takes into account the sample size and the degrees of freedom of the Chi-Square test to constrain the test statistic's range between 0 and 1 (Field, 2021). The SAR analysis is used to determine the source of the observed association. According to Everitt (1992), in an ideal probabilistic distribution case, SARs can indicate categories that deviate from the statistically expected probability. Mayers (2013) suggests that values greater than 1.96 or less than -1.96 indicate that there are significantly more or fewer observations than expected. Conversely, when SAR < 1.96, there is no evidence of significant differences between the expected and observed case numbers.

All the aforementioned quantitative analyses were performed using the R statistical software, version 4.1.1 (R Core Team, 2023), chosen for its free, open-source nature and ease of use, which supports the effective development of the research. The significance level adopted

was 5%, a standard value in the literature for assessing whether the results are statistically relevant.

Results and Discussion

This section is divided into three subsections. The first highlights some characteristics of Simce/Chile and SAEB/Brazil, emphasizing their similarities and educational products through a comparative study (Bloch, 1998). Subsequently, descriptive statistical analyses are presented, considering the results obtained by the educational institutions investigated in the 2019 assessments of the respective systems. Finally, the results of a correlational study based on cross-references between information on socioeconomic indicators from each country and the performance of these educational institutions are presented. These results are accompanied by a discussion in all subsections.

Some Similarities Between Simce/Chile and SAEB/Brazil

In the Latin American context, educational assessment systems emerged in the 1980s, during a period marked by the rise of neoliberalism and a global economic crisis that resulted in the creation of a political culture (Bernstein, 1998; Motta, 2009) hat emphasizes results-oriented knowledge and the practice of evaluation as the central axis of developed educational policies (Mendonça, 2014; Soares; Soares; Santos, 2021).

In this regard, and considering that the recent democratization of countries in the region weakened their political systems, the World Bank began offering credit lines for the implementation of centralized educational assessment systems in various countries across the continent. In return, the multilateral institution proposed some conditions for financing, making the process homogeneous in these countries (Altmann, 2002). Thus, common characteristics of the systems implemented in the region include sample-based and biennial tests, comprehensive analyses of education networks, assessment of the final stages of each educational cycle, and prioritization of certain curricular components (usually Vernacular Language and Mathematics), among others.

Specifically, Simce/Chile and SAEB/Brazil exhibit signs of a convergent conception of quality in education, primarily focused on results. This trend is particularly noticeable in their operationalization. For example, the development of the test items is supported by a nationally

standardized curriculum and learning measurement is conducted using proficiency scales constructed from Item Response Theory[7] (TRI).

According to information available on the Simce/Chile and Saeb/Brazil websites, the IRT model used in both is the three-parameter logistic model, which considers: the item's discrimination ability (parameter "a"), meaning the ability to identify students who have (or have not) developed a specific skill; the difficulty level (parameter "b"); and the probability of guessing correctly (parameter "c"). This last parameter is useful for identifying and adjusting for unlikely correct answers (guesses), which could compromise the validity of the analyses. Additionally, it is known that the proficiency scale adopted in both countries has a mean of 250 points and a standard deviation of 50 points, values defined from the initial applications of the systems in their respective countries.

It is also important to consider that, along with the tests, questionnaires are administered to contextualize the learning measures produced in each country. These instruments allow for a deeper understanding of the educational reality and are indispensable for a more systemic analysis of education. Chart 2 highlights some other characteristics of the systems.

Chart 2 – Some Characteristics of Simce/Chile and SAEB/Brazil

	Simce	**SAEB**
Year of implementation	1988	1993
Responsible agency	*Agencia de Calidad de la Educación* (ACE)	National Institute of Studies and Educational Research Anísio Teixeira (INEP)
Grades assessed	2nd, 4th, 6th and 8th grade of Elementary School and 2nd and 3rd grade of High School	5th and 9th grade of Elementary School and 3rd and 4th grade of High School
Subjects assessed	Language and Communication (Reading and Writing Comprehension), Mathematics, Natural Sciences, History, Geography, Social Sciences and English	Portuguese Language and Mathematics
Frequency	Annually. Schools are informed in a timely manner about the subjects that will be assessed in the current year, at the corresponding level	Biennially
Type of application	Census and mandatory for all basic education schools	The census is mandatory for public institutions and optional for private institutions

Source: Prepared by the authors based on information from the Simce/Chile and SAEB/Brazil websites.

According to the conceptual delineation proposed by Orfield and Wald (2000), the assessments that comprise Simce/Chile and SAEB/Brazil are national in nature, developed with

[7] According to Andrade, Tavares, and Valle (2000, p. 8, our translation), IRT is a "[...] set of mathematical models that aim to explain the probability of an individual responding correctly to an item, considering the item parameters and the individual's proficiency".

the purpose of producing metadata for education in their respective countries, and initially had weak effects on the individuals operating within the daily activities of school units (low-stakes testing). However, both systems are currently undergoing reforms known as the "new Simce" and "new SAEB," which could result in a shift in perspective regarding the impacts their results might have on these individuals.

In the first case, the idea is to promote an articulation between three components of learning assessment: summative assessment, progressive assessment, and formative assessment. This approach aims to provide more precise information to schools for internal and voluntary use, in order to guide pedagogical practices capable of supporting teachers in designing actions that respond to detected needs (Soares; Soares; Santos, 2022).

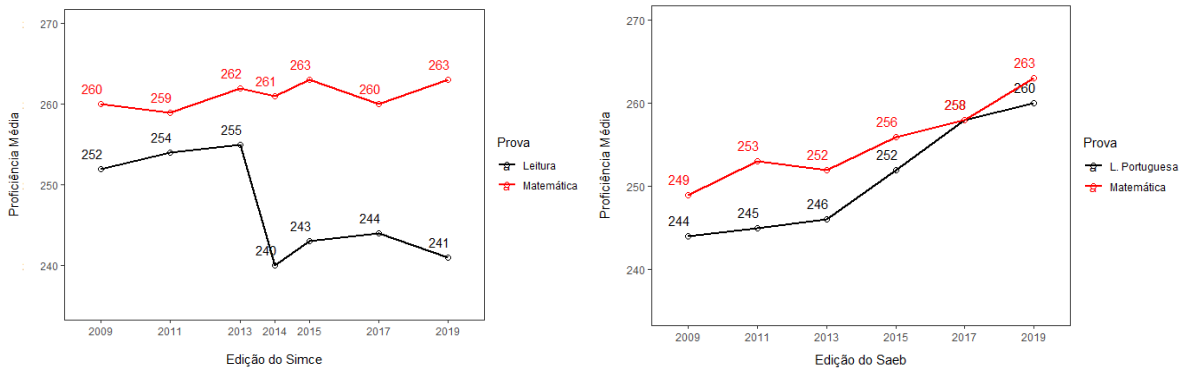
The reform of the Brazilian assessment system mainly corresponds to its expansion. The plan is to annually and censitarily assess all school grades for all institutions (public and private). Additionally, tests in human sciences and natural sciences will be administered, and the results achieved by high school students can be used to access higher education in the country. This indicates a transitional movement regarding the effect produced by the assessments that constitute the system, which will become high-stakes testing (Orfield; Wald, 2000).

It is worth noting that, considering the pandemic scenario caused by the Sars-CoV-2 virus, the coronavirus, from late 2019 onwards, these changes have not yet been implemented. With the advancement of vaccination and the resumption of in-person activities in schools, it is expected that this will occur starting in 2022.

Descriptive Analyses of Simce/Chile and SAEB/Brazil Results

Figure 1 represents the average proficiencies obtained in the Language and Communication (considering the Reading component) and Mathematics tests of Simce/Chile, and the Portuguese Language and Mathematics tests of SAEB/Brazil, administered for the final year of Elementary Education between 2009 and 2019. It can be observed that while the Brazilian system showed significant improvement over the years, the Chilean system remained stable in Mathematics performance and declined in Reading.

Figure 1 – Average Proficiency in Reading/Portuguese Language and Mathematics in Simce/Chile (applied to 8th grade) and SAEB/Brazil (applied to 9th grade of Elementary Education) between 2009 and 2019



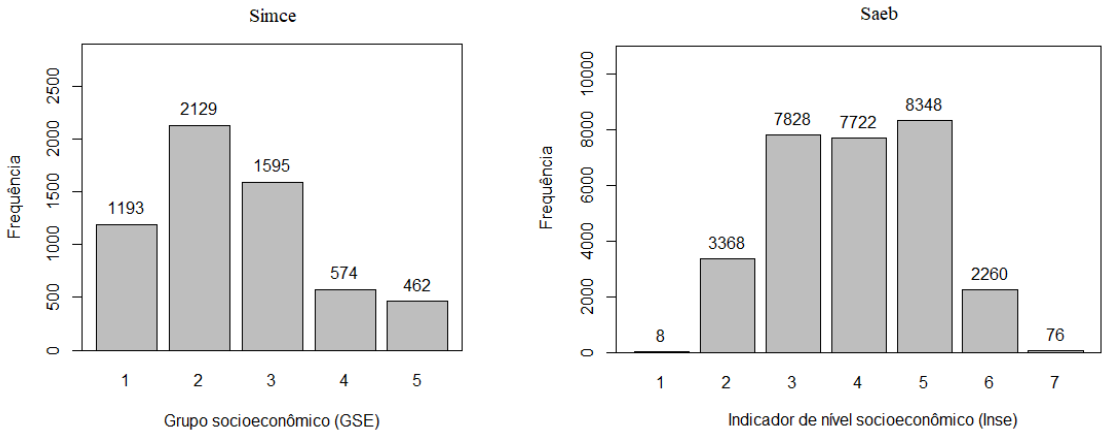
Source: Prepared by the authors based on information obtained from the Simce/Chile and SAEB/Brazil websites.

Considering specifically the 2019 edition, the most recent with data available when this research was conducted, Simce/Chile was administered on October 8 and 9 to 222,353 8th-grade students from 5,953 establishments across the country, achieving 99% coverage. As shown in Figure 1, students achieved an average proficiency of 241 points in Reading, the second-lowest performance in the historical series presented (2009 – 2019). On the other hand, in Mathematics, the best school performance of the period was obtained, where, as in 2015, students achieved an average proficiency of 263 points (Chile, 2021).

SAEB/Brazil, in turn, was administered between October 21 and November 1. In the 9th grade, 1,944,574 students from 37,916 schools took the test, of which 29,720 had their results disclosed (90 did not present INSE). The average proficiency obtained in the Portuguese Language was 260, and in Mathematics, it was 263 points, representing the best school performance in the historical series presented (2009 – 2019) for both subjects (Brasil, 2021).

In order to obtain a classification by proficiency groups for schools, the calculation of school performance quartiles by country was performed, which allowed for the establishment of four groups. Regarding the NSE of students from these schools, Figure 2 indicates the frequency distribution of the GSE/Chile and INSE/Brazil indicators.

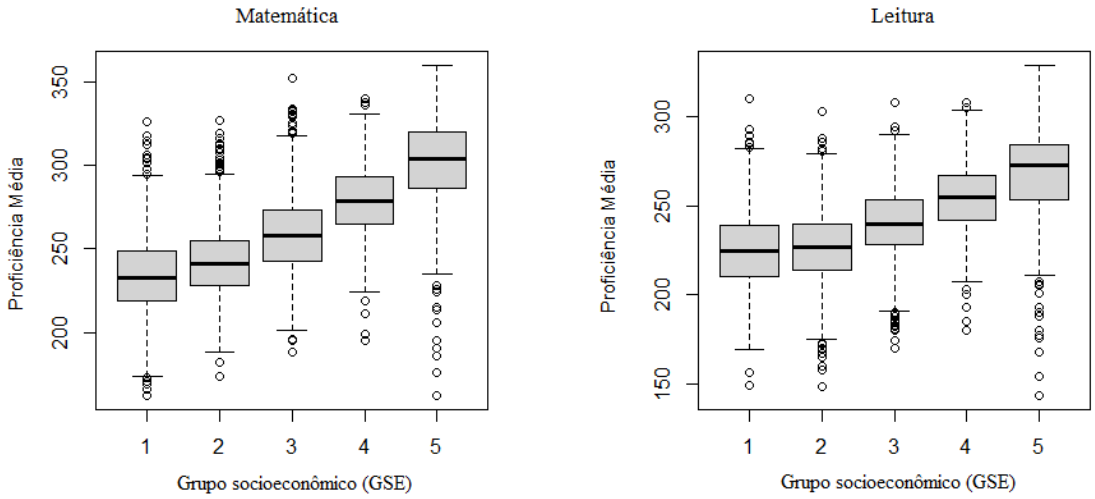
Figure 2 – Frequency Distribution by NSE Indicators in Simce/Chile and SAEB/Brazil

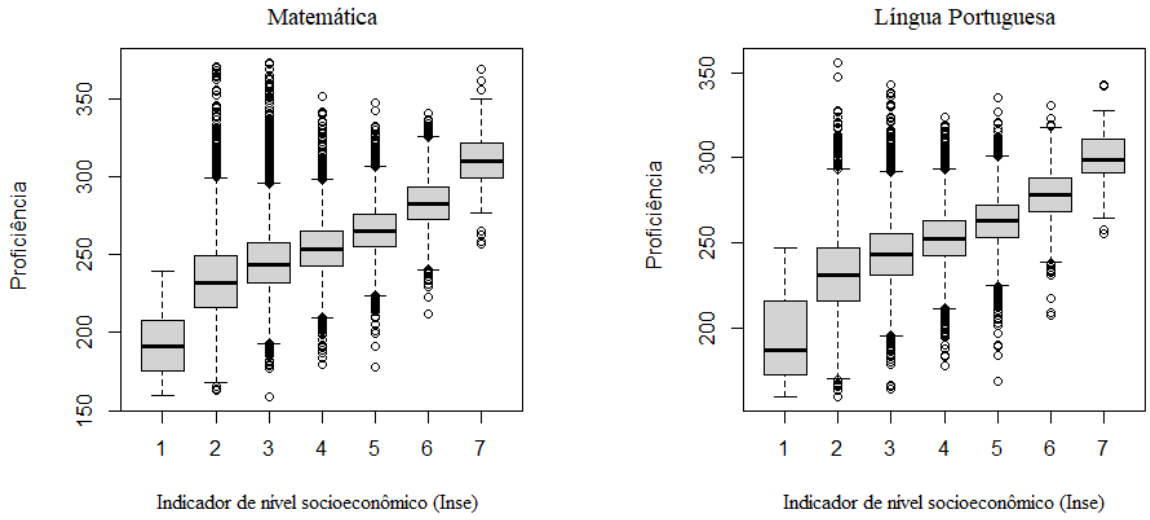


Source: Prepared by the authors based on analysis results.

From a descriptive analysis of Figure 2, it is possible to observe an asymmetrical left-skewed distribution for the Chilean indicator, revealing that schools serving more socioeconomically vulnerable students are more frequent in the country. For the Brazilian indicator, a symmetrical distribution trend around the medium levels is observed. Figure 3 shows the boxplots of the average proficiencies obtained in the subjects assessed by Simce/Chile and SAEB/Brazil in 2019, respectively, considering each NSE category analyzed.

Figure 3 – Boxplots of Average Proficiencies Obtained in Simce/Chile in 2019 by GSE Indicator Category, Considering the Analyzed Subjects





Source: Prepared by the authors based on analysis results.

Noting that in all analyzed scenarios, the higher the NSE indicator, the higher the average proficiencies of the students, the descriptive analysis of the boxplots corroborates the influence of the socioeconomic factor on school performance. This relationship is consistent with Bourdieu's theory, which argues that students with greater capital tend to perform better in the educational system. However, in terms of statistical significance, this conclusion can only be made through a correlational study between these factors, which will be presented in the following subsection.

Correlational Study Between Students' Socioeconomic Status and Educational Outcomes of Simce/Chile and SAEB/Brazil Applied in 2019

For the proposed correlational study, schools with INSE/Brazil 1 and 7 were grouped with those with INSE/Brazil 2 and 6, respectively, considering the low-frequency distribution at the extremes of the indicator, as evidenced in Figure 2. The Pearson Chi-Square test analysis indicated that there is a statistically significant association between proficiency groups and INSE/Brazil for both the Mathematics test [χ^2 (12, N = 29597) = 11325; $p < 0.001$; V = 0.36] and the Portuguese Language test [χ^2 (12, N = 29596) = 10968; $p < 0.001$; V = 0.35]. For Simce/Chile, this was also the conclusion for the Mathematics test [χ^2 (12, N = 5909) = 2469.4; $p < 0.001$; V = 0.37] and the Reading test [χ^2 (12, N = 5911) = 1707.2; $p < 0.001$; V = 0.31], considering proficiency groups and GSE/Chile.

It is important to note that, although the analyses were conducted on relatively large samples, the effect size produced by the association of the variables was significant in all analyzed scenarios, according to Cohen's classification (1988). Thus, through the Pearson Chi-

Square test, it was concluded that there is a statistically significant and robust association between the average proficiency obtained in the evaluations that make up the Chilean and Brazilian systems and the NSE of the students who took them.

In order to describe more precisely the information used in the inferential analyses reported for Simce/Chile, Table 1, a contingency table, indicates the number of schools belonging to each analyzed group and the percentage it represents. It also presents the RPAs, which allow for a more systemic analysis of the verified association, identifying the source and magnitude of the observed association. As stated, these residues represent the difference between the expected and observed frequencies, expressed in standard deviation units. In summary, the larger the absolute value, the stronger the association between the variables for a given cell.

Table 1 – Absolute Number, Percentage, and Adjusted Standardized Residuals for Each Analysis Category, Considering Simce/Chile 2019 Evaluations

				Proficiencies (separated by quartiles)				
				G1	G2	G3	G4	Total
GSE	1	MAT	N	591	308	196	69	1164
			%	10,00	5,21	3,32	1,17	19,70
			RAP	21,241	1,623	-7,146	-16,231	
		LET	N	505	305	236	120	1166
			%	8,54	5,16	3,99	2,03	19,72
			RAP	14,506	1,410	-4,178	-12,188	
	2	MAT	N	742	692	489	196	2119
			%	12,56	11,71	8,27	3,32	35,86
			RAP	11,479	10,717	-2,503	-20,046	
		LET	N	771	648	484	217	2120
			%	13,04	10,96	8,19	3,67	35,86
			RAP	12,840	8,015	-2,864	-18,462	
	3	MAT	N	192	400	582	419	1593
			%	3,25	6,77	9,85	7,09	26,96
			RAP	-15,052	0,527	12,487	2,311	
		LET	N	240	408	531	414	1593
			%	4,06	6,90	8,98	7,00	26,95
			RAP	-12,107	1,136	9,002	2,243	
	4	MAT	N	13	36	172	352	573
			%	0,22	0,61	2,91	5,96	9,70
			RAP	-13,721	-10,723	2,942	21,912	
		LET	N	28	64	168	313	573
			%	0,47	1,08	2,84	5,30	9,69
			RAP	-12,340	-7,838	2,520	18,114	
	5	MAT	N	12	19	36	393	460
			%	0,20	0,32	0,61	6,65	7,78
			RAP	-11,993	-10,624	-8,843	31,948	
		LET	N	23	27	58	351	459
			%	0,39	0,46	0,98	5,94	7,77
			RAP	-10,865	-9,681	-6,364	27,463	
		MAT	N	1550	1455	1475	1429	5909

		%	26,23	24,63	24,96	24,18	100
Total	**LET**	**N**	1567	1452	1477	1415	5911
		%	26,51	24,56	24,99	23,94	100

Source: Prepared by the authors based on analysis results.

It is noted that the total number of schools in the four proficiency groups of Simce/Chile considered is highly unbalanced, particularly in the extreme categories of the indicators. Thus, the analysis via RPAs becomes essential, as it can indicate how much the observed values deviate from the expected ones when assuming an ideal probabilistic distribution. From the RPAs, it can be stated that the association between school performance and NSE is even stronger in the extreme categories of the indicators.

For instance, the most vulnerable schools (GSE = 1) exhibit residuals of 21.241 for Mathematics in the lower proficiency group (G1) compared to -16.231 residuals in the upper group (G4). For Reading, the corresponding values are 14.506 and -12.188, respectively, indicating that in both cases, the number of schools with low (high) proficiencies for the first level of the GSE indicator is statistically and significantly greater (less) than expected in terms of balance. The same analysis can be performed for the other levels of GSE, where there is statistical significance in at least one proficiency group in all situations investigated.

This analysis can also be conducted for the SAEB/Brazil test, whose contingency Table 2 indicates the number of schools belonging to each analyzed group, the percentage it represents, and the RPAs for analyzing the source and magnitude of the observed association.

Table 2 – Absolute Number, Percentage, and Adjusted Standardized Residuals for Each Analysis Category, Considering SAEB/Brazil 2019 Evaluations

				Proficiencies (separated by quartiles)				**Total**
				G1	**G2**	**G3**	**G4**	
Inse	**1/2**	**MAT**	**N**	2128	615	354	278	3375
			%	7,19	2,08	1,19	0,94	11,40
			RAP	54,458	-9,681	-20,748	-23,926	
		LP	**N**	2136	665	358	217	3376
			%	7,22	2,25	1,21	0,73	11,41
			RAP	54,660	-7,634	-20,639	-26,357	
	3	**MAT**	**N**	3305	2332	1297	892	7826
			%	11,17	7,88	4,38	3,01	26,44
			RAP	41,345	11,388	-20,193	-32,458	
		LP	**N**	3264	2360	1371	830	7825
			%	11,03	7,97	4,63	2,80	26,44
			RAP	39,944	12,143	-18,031	-34,067	
	4	**MAT**	**N**	1545	2617	2259	1293	7714
			%	5,22	8,84	7,63	4,37	26,06
			RAP	-11,501	21,011	9,965	-19,495	
		LP	**N**	1481	2597	2306	1333	7717
			%	5,00	8,77	7,79	4,50	26,07

		RAP	-13,602	20,265	11,265	-17,994	
5	**MAT**	**N**	378	1762	3111	3095	8346
		%	1,28	5,95	10,51	10,46	28,20
		RAP	-50,784	-9,718	30,399	30,001	
	LP	**N**	487	1676	2997	3183	8343
		%	1,65	5,66	10,13	10,75	28,19
		RAP	-47,613	-12,358	26,899	33,064	
6/7	**MAT**	**N**	13	78	395	1850	2336
		%	0,05	0,26	1,33	6,25	7,89
		RAP	-28,348	-25,205	-9,468	62,971	
	LP	**N**	17	118	397	1803	2335
		%	0,06	0,40	1,34	6,09	7,89
		RAP	-28,185	-23,241	-9,404	60,935	
Total	**MAT**	**N**	7369	7404	7416	7408	29597
		%	24,90	25,01	25,06	25,03	100
	LP	**N**	7385	7416	7429	7366	29596
		%	24,95	25,06	25,10	24,89	100

Source: Prepared by the authors based on analysis results.

As with the Simce/Chile test, the association between school performance and NSE, considering SAEB/Brazil, is stronger in the extreme categories of the indicators. When observing only the units with the highest (lowest) NSE, it is possible to infer that the number of schools belonging to the upper (lower) quartile of proficiency is considerably above what is expected for a situation with a balanced distribution of frequencies.

In other words, students with greater capital (higher NSE) are more likely to achieve higher proficiency levels, while students with lesser capital (lower NSE) may face more significant challenges in their academic performance. This evidence underscores the importance of considering the socioeconomic context of students when analyzing performance in standardized assessments.

The comparative analysis between the countries also shows that the phenomenon of NSE influence on school performance manifests similarly in both countries. For both SAEB/Brazil and Simce/Chile, a stronger association was found between student performance and NSE in the extreme categories of their respective socioeconomic indicators, which indicate situations of greater and lesser vulnerability.

These results indicate that the education systems in these countries still function as mechanisms for reproducing and legitimizing social inequalities. This aligns with Pierre Bourdieu's theory of social conservation, legitimizing the dominance of the dominant groups by ignoring the socioeconomic and cultural realities of the students in a process of social reproduction with a significant impact on education.

However, this capital conditions but does not necessarily determine the school performance of students, which can be observed by the breadth of the interquartile range and variation in the boxplots represented in Figure 3. In addition to outliers, there is notable variability in results, especially in the extreme groups of socioeconomic indicators, which deserve to be specifically studied in future research.

Final considerations

This article was developed with the aim of analyzing the influence of socioeconomic factors on student performance in standardized assessments conducted by SAEB/Brazil and Simce/Chile, seeking to understand the role of schools in the reproduction and legitimization of social inequalities in both countries.

Initially, it was possible to identify indications of a convergent conception of quality in education adopted in both countries, as evidenced by the models and methodologies of school evaluation assumed. From the analysis of the normative documents that regulate them, it was possible to identify similarities in both their structure and the educational products they generate. It should be noted that Simce/Chile and SAEB/Brazil emerged during a period marked by educational reforms in Latin America, many of which were funded by the World Bank, whose conditions justify some similarities between the evaluation processes in these countries.

Regarding the statistical analyses conducted, it was possible to verify that the socioeconomic level, measured through the indicators produced in each country from the contextual questionnaires applied along with the assessments (INSE/Brazil and GSE/Chile), has a strong influence on student performance.

Pierre Bourdieu's theory, which emphasizes the influence of capital and NSE on educational inequalities, provides a coherent theoretical lens to understand this relationship in both nations, highlighting the relevance of considering the socioeconomic factor when addressing issues of equity and justice in the educational system. However, despite this influence being statistically verified, it is necessary to consider that socioeconomic factor conditions do not determine educational outcomes. In future studies, it seems interesting to investigate how some schools manage to achieve good educational indices, although they predominantly serve students in vulnerable situations, considering especially the teaching-learning processes that permeate their educational actions.

Moreover, this research signals the need to develop new strategies that contribute to balancing the expectations of school success for individuals from different social backgrounds, such as new public policies that aim to reduce social, economic, and cultural inequalities in the involved countries. It is also proposed, considering the current context of reforms that have been promoted in the educational scenario in both countries, that the evaluation process be more democratic, dynamic, and integrative, focusing on learning with an emphasis on formative and feedback-driven process evaluation, enhancing educational practice from the context in which it is inserted. In this way, a call is made for a pluralistic and democratic school that values the education of critical and responsible citizens, beyond the pursuit of good quantitative results.

As a limitation of this study, it is highlighted that student performance can be explained by a multiplicity of material and social factors external to the school, as well as by cultural, professional, and symbolic factors that constitute daily life. In fact, reducing the explanation of school performance to the socioeconomic level does not fully account for its complexity. Although not the object of this research, these factors can be assumed as explanatory variables in future studies as well. Finally, it is necessary to consider that the contributions of statistics to the analysis and generalization of the results obtained should be weighed against the inherent limits of empirical methodology.

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CRediT Author Statement

Acknowledgements: Federal University of Espírito Santo (UFES), Federal Institute of Minas Gerais (IFMG), Federal Institute of the South of Minas Gerais (IFSULDEMINAS), and University of Santiago de Chile (USACH).

Funding: The research reflected in the production of this article received funding through research projects supported by the National Council for Scientific and Technological Development (CNPq) - Universal 2021, process number 405632/2021-5, and by the Espírito Santo Research and Innovation Foundation (Fapes) Call No. 12/2020 - Technical-Scientific Internship and Technical-Scientific Visit, under SIAFEM numbers 2021-C7HJV and 2021-R2SNJ. We extend our gratitude, as this work would not have been possible without the proper support.

Conflicts of interest: The authors certify that they have no commercial or associative interests that represent a conflict of interest in relation to the manuscript.

Ethical approval: Not applicable.

Availability of data and material: Not applicable.

Author contributions: Conceptualization, Investigation, Methodology, Analysis, Writing: Soares, D. J. M; Soares, T. E. A.; Ríos-Muñoz, D.; Santos, W.

Processing and editing: Editora Ibero-Americana de Educação.
Proofreading, formatting, normalization and translation.