The space of educational inequalities in São Paulo and Recife

O espaço das desigualdades educativas em São Paulo e em Recife

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ABSTRACT

This paper presents an empirical study on the social and educational gaps between Recife and São Paulo, cities characterized by fast urbanization and strongly unequal urban configurations. Based on the notion of social space and statistical data from the last Population Census (IBGE/ 2010), we present a study on the space of educational disparities in the two metropolises. The objective was to test the relevance of the notion of social space in the Brazilian context, identifying at once, the distribution of social groups and their educational investments. We argue that the notion of social space can integrate several other key concepts of Bourdieusian sociology. We mobilize a large set of variables captured simultaneously, bringing to light the differences within the two metropolises and between the cities. The study's originality lies in starting from this wide range of objective indicators related to living conditions, associating it with the use of indicators likely to be perceived as "subjective." As expected, the first axis strongly correlates with longevity, household income, and education level. The second axis is the result of the correlation between the possession of a high school diploma and the presence of greater public infrastructure. In Recife, this second axis concerns a few neighborhoods in the city. In São Paulo, however, the same correlation is observed with a much larger set of neighborhoods in intermediate social positions. It is also noticeable that Recife has a much larger number of regions in extreme poverty compared to São Paulo.

Keywords: Pierre Bourdieu; social space; educational inequalities; Principal Component Analysis; sociology of education.

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RESUMO

Neste artigo nós apresentamos um estudo empírico sobre as clivagens sociais e educacionais Recife e São Paulo, cidades caracterizadas pela urbanização acelerada e configurações urbanas fortemente desiguais. Com base na noção de espaço social e, em dados estatísticos do último Censo Populacional (IBGE/ 2010), apresenta-se um estudo sobre o espaço das disparidades educacionais nas duas metrópoles. O objetivo foi testar a pertinência da noção de espaço social no contexto brasileiro, identificando de uma só vez, a distribuição dos grupos sociais e seus investimentos educativos. Argumenta-se que a noção de espaço social é capaz de integrar vários outros conceitos chaves da sociologia *bourdiesiana*. Mobilizamos um grande conjunto de variáveis capturadas simultaneamente, trazendo à tona as diferenças internas das duas metrópoles e entre as cidades. A originalidade do estudo reside em partir dessa gama ampla de indicadores objetivos, relativos às condições de vida, associando-o ao uso de indicadores suscetíveis de serem percebidos como "subjetivos". Como esperado, o primeiro eixo corresponde a uma forte correlação entre longevidade, renda domiciliar e nível de escolaridade. O segundo eixo é o resultado da correlação entre a posse do diploma de ensino secundário e a presença de maior infraestrutura pública. Em Recife, esse segundo eixo concerne a alguns bairros da cidade. Em São Paulo observa-se a mesma correlação, contudo, com a particularidade de apresentar um conjunto muito maior de bairros em posições sociais intermediárias. Nota-se ainda que Recife possui um número muito maior de regiões em situação de extrema pobreza se comparado à São Paulo.

Palavras-chaves: Pierre Bourdieu; espaço social; desigualdades educacionais; Análise de Componentes Principais; sociologia da educação.

Introduction

This article analyzes the existing relationship between social and educational inequalities in two Brazilian urban contexts: Recife and São Paulo. It explores what happens in the extreme contexts of wealth and poverty in both state capitals, paying attention to intermediate situations and the progressive increase in schooling and women's formal jobs. The text results from a statistical analysis based on the last Population Census of the *Instituto Brasileiro de Geografia e Estatística* (IBGE/ 2010) available for different intra-municipal regions of Recife and São Paulo.

With this empirical study, we test the pertinence of the notion of social space, developed by Pierre Bourdieu (2011), resorting, as the author did, to the support of statistical methods of Geometric Data Analysis (GDA) more appropriate to the relational concept of the social world and the multidimensionality of social reality (LEBARON; LE ROUX, 2013). If the importance of quantification in Bourdieu's sociology of education goes back to *Les Héritiers* (1964), the development of the notions of social space and field, progressively raised in *La Distinction* (1979) and *La Noblesse d'État* (1989), for example, was established with the support of Multiple Correspondence Analysis (MCA). In this perspective, the articulation with Bourdieusian theory also

lies in the choice of variables. This dimension was central in this study, revealing its genesis in Bourdieusian sociology.

In "The Social Space and the Genesis of Groups," Bourdieu (2011) defines the social space as positional, contraposing classes only on paper, that is, defined and named, from the more or less abstract categories present in certain Marxist traditions. For him, "On the basis of knowledge of the space of positions, one can separate out classes, in the logical sense of the word, i.e., sets of agents who occupy similar positions and who, being placed in similar conditions and subjected to similar conditionings, have every likelihood of having similar dispositions and interests and therefore of producing similar practices and adopting similar stances". (BOURDIEU, 2011, p.136). Through statistical inquiry – according to Bourdieu, the only way of building a social space – we seek to relate the social position, in Recife and São Paulo, with educational investments, able to be apprehended within the limits of the available statistics for both cities. Furthermore, according to the Bourdieusian formulation of social space, the agents distribute themselves in the space, at first, depending on the volume of capital and, in a second dimension, according to the composition of their capital.[1]Let us observe, for example, how we reconstruct the social space of these two metropolises. First, based on the apprehension of different forms of capital (economic and cultural capital, mainly, as we do not have the statistical information of other forms of capital). Secondly, because we relate the space of social positions to a series of decisions, never completely free, conceived in the Bourdieusian perspective as "decision-taking."

We argue that the notion of social space can integrate many other vital concepts of Bourdieusian sociology, such as the structure of capitals, field, *habitus*, capital, structural homologies, *illusio*, and others. With this study, we reconstruct a social space of educational inequalities, aiming to explore the cities in the light of Pierre Bourdieu's theory. By educational inequality, we understand the differences in access and guidance within the educational systems derived from social, geographic, gender, ethnic-racial origins, etc. (LEBARON, 2014).

The choice of Recife and São Paulo as an empirical field is because these are Brazilian metropolises that experienced a quick urbanization process from the turn of the 19th century to the first decades of the 20th century (MORSE, 1970; SINGER,

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[1] The studies that seek to test the pertinence of the notion of social space in other national realities reveal that Bourdieu's ambition to propose concepts with a potential to be universally applied was not in vain. See, for example, Johs Hjellbrekke & Olav Korsnes (2013) in Norway. For Latin American cities, see the studies from Alícia Gutierrez and Manuel Giovine's (2017) team about the city of Cordoba in Argentina. Also see, Perosa, Lebaron, and Leite (2015), for the city of São Paulo.

1974; FREYRE, 1961; SOUZA, 2015)[2]In both cases, the economic increase and urbanization were followed by the formation of several "peripheral" neighborhoods, whose population lives under precarious conditions, sometimes without essential public services, such as sewage system, health equipment, and education. In both cities, there were significant reformulations during the 20th century. In São Paulo, they were provoked by migratory flows triggered by the process of industrialization. In Recife, since the first decade of the 20th century, the increase of the population contingent was strongly related to the intense commercial activity in this port city. Recife, located in the Northeast region of Brazil, and São Paulo, in the Southeast region, offer the opportunity of observing Brazilian regional contrasts.

Recife consolidated itself as an important financial and commercial center of the North region of Brazil with the opening of the colonial ports to the nations (1808) due to its strong agro-export potential for the commercialization of sugar cane and cotton (PRADO Jr, 1994, p. 127). A reference for the international market of the time, Recife attracted travelers, merchants, and tradespeople of various activities and articles for the city, hence, contributing to the expansion of the urban economy. Besides this, the installation of plants in the most central areas of the city, the vaccination campaigns, and the process of modernization of the sewage system have significantly increased the population of Recife (DUARTE, 2005, p. 55). Between 1810 and 1872, the estimation is that the population of Recife has multiplied by four, going from 26,000 to 100,000 inhabitants (ZANCHETTI, 1989, p.136).

Regarding the consolidation of the educational system, municipal primary schools and private Catholic schools, managed by different religious congregations (Jesuits, Salesians, Marist, and Carmelites), established themselves initially in the central region of the city, a place of commerce, inhabited by the wealthier groups, which would mix with the poor population. Urban reforms, which started in 1920 and gained shape in the 1940s and 1950s, removed the poor population and precarious houses from the city center (FREYRE, 1961), covered the mangroves, and allotted the old sugar cane mills and country houses in the direction west and north. Nowadays, the allotment corresponds to the following neighborhoods: Boa Vista, Derby, Graças, Aflitos, Espinheiro, Jaqueira, Madalena, Torre, Campo Grande, Encruzilhada, and Grande Casa Forte. Private and public schools were established there to attend to traditional rural families, merchants, and bankers who lived in the center. The edification of the south region, close to the beach, dates to the 1950s. Today it receives the economic bourgeoisie of the city. In 1970, Recife's population reached over 1 million inhabitants.

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[2] This process took place all over Brazil, in different intensities, when, since the 1960s, the country has become predominantly urban. Source: IBGE, Censo demográfico 1940-2010. Available at https://seriesestatisticas.ibge.gov.br/series.aspx?no=10&op=0&vcodigo=POP122 &t=taxa-urbanizacao, Accessed September 20, 2021.

São Paulo stopped having the characteristics of a provincial commercial city to gradually become Brazil's most prominent economic center in the last decades of the 19th century and the first decades of the 20th century. The wealth provided by coffee and later the industry to substitute imports led to a population increase from 600 thousand inhabitants in 1920 to 2 million in 1940, followed by the explosion of the school population, obligatory since 1934 in the country. As in Recife, the arrival of private schools, predominantly catholic but also secular, not rarely created by European immigrants, created a solid school market, segmented by social origin and gender (PEROSA, 2010; ALMEIDA, 2017), with structural characteristics close to those shown by Fritz Ringer regarding the French and German educational systems (RINGER, 1979, 2003).

The data of the last population census of Brazil and the school census (IBGE/2010 and INEP/2010) help to perceive some structural aspects of the current state of the education system in both cities. In Recife, the public education system answers for 64% of enrolments, giving much space for private initiatives. Despite the offer of highly varied private schools, in São Paulo the government answers to almost 80% of enrolments, a percentage that increases in the city's poorest regions and can reach only 36% in Pinheiros, which concentrates households of greater economic and cultural capital.

TABLE 1- Synthesis of educational indicators.

Main indicators of access and tracking within the educational system	São Paulo	Recife
Enrollment in public Middle School	79%	64%
Enrollment in public High School	82%	71%
Illiteracy rate	3%	9%
High School dropout	5%	11%

SOURCE: Population Census (IBGE/2010) and School Census (INEP/2010).

Despite the advancements in reducing illiteracy rates, historically high in the country, Recife still has three times the number of non-literate people compared with São Paulo. The difference between the high school dropout rates is more than double that of São Paulo. As we know, school dropout is strongly associated with low-income families and the strong need for children and youngsters to work. Income inequality has increased with a few setbacks (HASENBALG; SILVA, 2003; PIKETTY, 2019). In the case of Recife, wealth concentration has practically not changed in the last decades (GINI index -0.68 continued almost the same between 1990 and 2010). In its turn, São Paulo kept an increasing level of income concentration> from 0.57 in 1990 to 0.64 in

2010. The 2018 information shows the stability in the inequality patterns in Brazilian metropolises, Recife with a 0.60 GINI index and São Paulo with 0.58%. In this context of school expansion and increasing social inequalities during the last decades, it is pertinent to question in what measure "quantitative democratization," as the simple generalized access to school, produces a translation of inequalities to the inside of the educational system, as argued by Bourdieu and Passeron in *Les Héritiers* (BOURDIEU; PASSERON, 1964) and later in *Les exclus de l'intérieur* (BOURDIEU, 1992). In the context of Brazilian metropolises, characterized by the recent increase in the population's schooling level, what is the current state of socio-educational inequalities?[3] To what measure did the increase in access to secondary education contribute to the increase in the proportion of intermediary positions in the social structure of both cities?

Education and social segregation

The representation in common sense, the media, and many researchers tend to describe cities by the analysis of extreme cases, opposing the "favelas" and the "poor neighborhoods" to the "noble and rich" neighborhoods, mirroring the dual model proposed by Sassen (2001) for the *global cities* (OBERTI; PRÉTECEILLE, 2016; PRÉTECEILLE; RIBEIRO, 1999)[4]. Many studies in social sciences tend to concentrate on the particular case of poor and stigmatized neighborhoods. Likewise, the educational literature privileges investigations of schools situated in spaces of social vulnerability, leaving the education of dominant and intermediate groups relatively less explored.[5]

More recently, some urban studies, such as those developed by Eduardo Marques (2014) about São Paulo showed that the extreme cases in the cities, the richest and the poorest regions, can be socially homogeneous. However, there are many regions of this capital where we can observe a robust social heterogeneity, even if they can be seen

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[3] Naturally, we intend to present the state of the education system in both Brazilian capitals within the limits of national statistics and, additionally, with the data of both different cities, from the same indicators. Thus, if the state of educational inequalities presented in this text is limited, this is due, to a great extent, to the availability of comparable statistics to both cities and aggregated by different intra-municipal regions.

[4] According to Sassen (2004), "*global cities*" can be characterized by a double dynamic of geographic dispersal and concentration, typical of the globalization phenomenon, marked by the increasing presence of multinationals, the importance assumed by the service sector, and the demand for highly qualified professionals. Such characteristics are common to São Paulo and Recife, which currently concentrate intense demands for education.

[5] The studies about the schooling of dominant groups and high middle classes were mainly developed in Brazil through the perspective of Bourdieu's sociology, by Maria Alice Nogueira and Ana Maria Almeida (2002), Graziela Perosa (2009), and other more recent studies.

and thought of as peripheral neighborhoods and territories. Our previous studies about the arrival of private schools on the outskirts of São Paulo have converging results (PEROSA; DANTAS, 2017).

In the hypothesis that grounds this research, schooling is a crucial dimension to describe the social structure of the cities beyond the privileged socio-spatial inequalities in urban studies. A second hypothesis refers to the acquisition of a high school diploma as a decisive fact that has contributed to distinguishing the fractions of elite groups and popular ones in Recife and São Paulo.

The interest in valuing the educational dimension is on the development of the cities beyond the economic dimension and systematically observing the incidence of different phenome between social groups, following the recommendation of the report *Beyond GDP* by Stiglitz, Fitoussi, and Sen (2009). It is a pertinent approach to studying highly unequal urban contexts because it sheds light on resource distribution (social, economic, education, etc.) between social groups, valuing the acquisition of cultural capital as a central aspect of the social structure.

For decades, there has been a consensus in the international educational literature about the strong correlation between the socio-economic level of families and school performance (BOURDIEU; PASSERON, 1964; COLEMAN, 1966, and BOUDON, 1973). The studies about large-scale assessments, such as PISA, reinforce this conclusion, though the intensity of this association varies among countries (BAUDELOT; ESTABLET, 2009). Pierre Merle (2012) argues that the relation between social segregation and academic segregation is internationally present. He distinguishes three groups among the OECD countries: those with a weaker relation between socio-economic level and school performance, for instance, Finland, Denmark, Norway, and Canada, among others. An intermediary group with a high correlation between school performance and socio-economic levels, such as France or Japan. A third group is established by countries where the educational systems are not efficient to combat inequalities previous to school, in this group we have Brazil, Thailand, Turkey, Hungary, and Mexico (MERLE, 2012, p. 18).

To approach the internal disparities of both cities, we were supported by the notion of social space, which invites us to relate social position and "position-taking" related to practices and strategies concerning the educational system. Bourdieu calls "decision-making" the "choices", between quotation marks, that agents make in different spheres of practice, from educational strategies to political preferences, passing through taste, matrimonial choices, etc. For him, "choices" are not free conscious decisions of a singular person (HAUCHECORNE, 2020, p. 680)[6]

On the other hand, the social space, built by a statistical inquiry, allows an exercise of

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[6] As argued by the economist Robert Boyer (2003), far from limiting the analysis of reproduction, the Bourdieusian perspective provides a series of change determinants.

topology, which is helpful to describe the set of cities and recognize the different urban configurations on them. In this perspective, the construction of social space is done from a set of properties pertinent to the ensemble of the population and not by theoretical principles of social classes. In the absence of socio-professional categories on an intra-municipal scale for these two cities, we considered household income, the population's educational level, and the public infrastructure in each region of both metropolises. Bourdieu offers several examples of operationalization of the notion of social space (BOURDIEU, 1979; 1989; 2011), in which he uses the analysis of correspondences as a tool to offer a graphic representation of the relational and multidimensional character of the social reality (LEBARON; LE ROUX, 2013).

The first main advantage of correspondence analysis is to offer a view of the ensemble of the researched universe. Furthermore, it allows us to work with many variables, operationalizing a study of multidimensionality and intersectionality. Despite the limitation in the availability of perfectly comparable statistics between both cities, the analysis of correspondences contributed to building a richer view of the social reality, including a greater number of variables and not limited to the strictly economic dimension.

This relational analysis of data has contributed to the reflexivity of research in the sociology of education. On the one hand, the case studies (of specific neighborhoods or schools, etc.) allow an in-depth analysis, offered by ethnographic observations, with field works of long-duration and, thus, a more refined understanding of social reality. On the other hand, there are also some risks. One of the most evident is the generalization of the representation of peripheral neighborhoods and schools, hiding differences that can be seen when we compare the composition of neighborhoods and their positions in the social structure of the city (OBERTI; PRÉTECEILLE, 2016).

Sources and methods

With no intention of erasing the particularities of the socio-historic formation of Recife and São Paulo, the first methodological concern was to establish a set of indicators that allowed their compatibility. Therefore, we tested the same group of hypotheses using the same variables of income and education and, as much as possible, the same indicators of public infrastructure, based on the last population Census of IBGE, in 2010. For our study, we use the technique of Principal Component Analysis[7] and choose as territorial units those which had information available at a more disaggregated level.

In the case of São Paulo, we opt for the sub-prefectures (31 total) as they are the most decentralized administrative units, including districts and neighborhoods. For

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[7] In this work, we used the program Spad, version 7.1.

Recife, we use the ponderation areas stipulated by IBGE (more disaggregated territorial partition which, in general, is larger than some neighborhoods of Recife), considering that the educational information was only available at this disaggregation level[8]

We were based on municipal statistics of Recife and São Paulo, taken from the Population Census IBGE/2010, which were responsible for the production of territorial information of both cities. We find in these municipal sectors of statistic data, geographers and statisticians eager to make this information "transparent" for the population and public managers, publishing them online on many pertinent scales in the cases of Recife and São Paulo.[9]

The greatest challenge was to find the same information for both cities, which explains the generic character of some measures used in this study. In both cases, we find a range of social and educational indicators connected to the particular challenges of each city, corroborating Desrosières's (2000) arguments about the development of European statistic systems, which are highly adjusted to the social problems recognized in each society. An example is the greater availability of data in Recife about the school structures focused on literacy and adult schooling, such as the enrollment rates of YAE (Youth and Adult Education). Each of this available information is a tool to observe local reality, historically emerged, intercrossed by history, and hesitations about how to transform social factors into measurable "things," such as unemployment, access to education, school dropout, etc. (DESROSIÈRES, 2000, p. 9).

The standard Principal Component Analysis (PAC), a method to examine the structure of statistical correlation of each city, was used from a set of variables, including indicators of population characteristics, regarding the volume and composition of economic and cultural capital. We also added indicative variables of the social properties of São Paulo's sub-prefectures and Recife's neighborhoods (see Table 2). In both cities, we have included data related to monthly income level in minimum wages (MW), the educational level of the population, and data on the public infrastructure available in the cities, for example, "public libraries" and "city gyms," besides the socio-demographic characteristics of the population. After, we chose the "illustrative variables" that helped us refine the correlation between life conditions and education investments, considered in the research as "position taking".

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[8] Once we extracted the information for the 40 areas of ponderation that compose the city of Recife, we decided to group them into ensembles of correspondent neighborhoods, totalizing 33 neighborhood areas. An area of ponderation has around 400 households.

[9] In 2011 the Law of Information Access in Brazil was published (Lei 12.527), forcing governmental bodies and entities to guarantee the transparent management of information, making obligatory the dissemination of public interest data on the official websites of these entities. In São Paulo, this information was gathered on Infocidade and GeoSampa (http://infocidade. prefeitura.sp.gov.br and http://geosampa.prefeitura.sp.gov.br).

TABLE 2 - Sctive variables.

Economic Capital (3)	Cultural Capital (3)	Public Infra-structure (2)	Socio-demographic indicators (3)
Monthly house-hold income until 2 MW Monthly household income between 2-10 SM Monthly house-hold income over 10 SM	Population with no formal education and incomplete elementary and middle school The population of high school graduates The population of higher education graduates	Households with no sewage Public infrastructure (gym and public libraries)	Population over 70 years old Population between 15 and 24 years old Population self-identified as black

SOURCE: Created by the authors (2020).

TABLE 3 - Illustrative variables.

School Investment (or lack of)	Other relevant information
The enrollment rate in private education The enrollment rate in higher education Illiterate population over 15 years old Dysfunction rate age/high school year Dysfunction rate age/middle school year Dropout rate during High school	Rate of formal women's job Rate of female head of household Rate of homicides and deaths in the population

SOURCE: Created by the authors (2020).

The universe of São Paulo households analyzed is 3,574,286, distributed in 31 sub-prefectures. In Recife is 470,754, distributed in 33 agglomerates of neighborhoods. Regarding income distribution, in both cities, the extremes are more balanced, as 6% (São Paulo) and 4% (Recife) of the households lived in 2010 with a nominal monthly income of up to ½ minimum wage and 6% (São Paulo) and 5% (Recife) with more than 20 minimum wages, respectively. However, there are regions in both cities where up to 55% (São Paulo) and 54% (Recife) of the population receive more than ten minimum wages, while in others, less than 1% of the population receives such income. Similarly, the data distribution regarding household conditions reveals the structural asymmetries in both cities.

In the São Paulo metropolis, the average rate of households with no sewage is 9%, with regions where 100% of the households have this public equipment and, in the opposite extreme of the social space, only 35% have this service. In the capital of Pernambuco, on the other hand, the average number of households with no sewage system is three times higher than in São Paulo and reaches 31%. In the poorer neighborhoods, this is the reality for almost 81% of the households. Aiming to understand how different socio-economic, cultural resources, and characteristics of public infrastructure correlate with educational investments, we compare the results of this study about the social space in São Paulo and Recife.

Operating a multidimensional analysis

The Principal Component Analysis (PAC) allows us to implement a multidimensional analysis in both cities when including a significant number of phenomena, generally treated separately, offering the opportunity to identify convergences and divergences between them. The result is a table composed of 64 individuals (the 31 sub-prefectures of São Paulo and the 33 neighborhoods of Recife) (Figure 1) and another with 11 active variables (Figure 2), which allowed us to build a cloud of multidimensional points, describing the characteristics of territorial unities in both cities. We describe here the (3) axis that sums up 85.22% of the total space variance. We start with the interpretation of axis 1, the horizontal axis that structures Figures 1 and 2. This axis corresponds to 56.33% of the statistical variance. After, we have axis 2, vertical, which contributes with 16.58% of the space. Axis 3 is responsible for 12.31% of the variance.

As expected in these urban contexts, the level of schooling, longevity, and population income seem to be strongly correlated. Axis 1 opposes the sub-prefectures of São Paulo and the wealthier neighborhoods of Recife and the highest percentage of higher education graduates, often in undignified conditions, with a high number of households with no sewage system. Parelheiros, M'Boi Mirim, Cidade Tiradentes, in São Paulo and Linha do Tiro, Água Fria, Dois Unidos in Recife are opposed to Pinheirosand Vila Mariana, in São Paulo, and the neighborhoods Aflitos, Boa Viagem, Jaqueira, in Recife.

If Parelheiros, in São Paulo, corresponds to the extreme poverty and precarious housing, Recife, in turn, has a much denser cloud of neighborhoods with the same characteristics. However, Recife's regions of extreme precariousness have no equivalent in São Paulo. Brejo da Guabiraba, Nova Descoberta, and Ilha Joana Bezerra are even more precarious regions than Parelheiros in São Paulo (PEROSA; LEBARON; LEITE, 2015). As we can see in the upper right quadrant in Figure 1, these clouds of regions (Brejo da Guabiraba, Nova Descoberta, Ilha Joana Bezerra) and underneath, Parelheiros,

FIGURE 1 - The social space of sub-prefectures and neighborhoods in SãoPaulo and Recife.
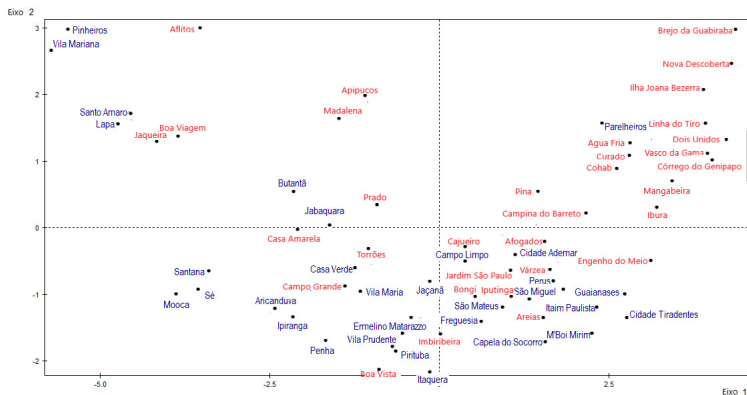
SOURCE: Created by the authors (2020).

FIGURE 2 - Circle of the correlation of active variables (São Paulo and Recife).
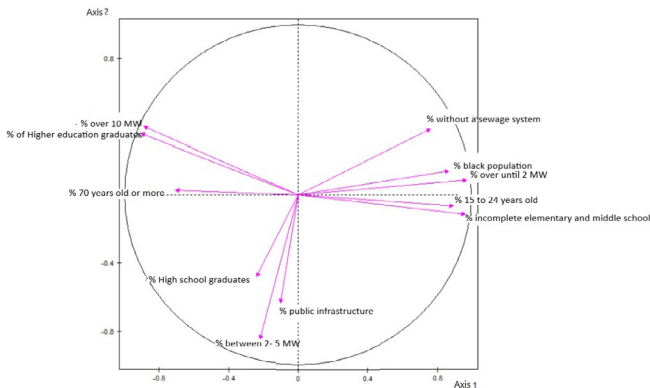
SOURCE: Created by the authors (2020).

Another significantly correlated dimension in Axis 1, is the self-declared race/color of the population. In the poorer urban agglomerates, with low income, low educational level, and lower availability of public infrastructure, we find a higher concentration of people who declare themselves (mixed race or black). Corroborating the national literature about Brazilian social inequalities, in the racial dimension established itself in a principle of differentiation of greater importance in Brazil (LIMA; RAMOS, 2017; VARGAS, 2015; TEIXEIRA, 2015; HASENBALG; SILVA, 2003).

The distribution of educational level and income in both metropolises is also associated with longevity. In the regions with less public infrastructure, with households with less income and lower educational levels, we find a more substantial presence of a young population and lower longevity, with a lower percentage of the population aged 70 years or older compared to the wealthiest areas of both cities. As shown in the sociological and epidemiological literature, the cumulative impacts between the material conditions and educational levels affect people's health are undeniable: be it because they provide more information on healthy behaviors, be it due to specialized health services (ALVES COIMBRA, 2017; SANTOS, 2011; ATTIAS-DONFUT, 1983). Attias-Donfut already argued, in "*La vieillesse inégale*"[The Unequal Aging] (1983), that longevity is also explained by the nature of work throughout life. The level of physical effort demanded is an important variable. Therefore, longevity could not be considered a universal benefit and equally distributed in society.

In general, the results pointed out when reading axis 1 does not differ from most studies about educational disparities when highlighting the positive correlation between better socio-economic conditions, higher educational levels, lower housing precariousness, and longer longevity. In Table 4, the correlation coefficients allow us to observe the contribution of each active variable for the definition of each axis and the intensity of correlations. We can see, for example, that the modality "Population self-declared black" is associated with axis 1, which opposed the extremes of social inequality in both cities. We can also see how having a higher education diploma is negatively correlated with the self-declaration as "black". We should never forget that correlation does not mean causality but the relation between variables.

All the coefficients over 0.40 can be considered as having strong correlations (LEBARON, 2006). The results of PAC allow us to identify a hierarchy of factors that differ the territories of both cities. As we can see in Table 4, for axis 2, the variable that has mostly contributed are the households with income between 2 to 10 minimum wages, followed by public infrastructure, and a high school diploma.

Beyond the extremes of social inequality expressed in axis 1, axis 2 is the one of intermediary position. It allows us to notice differences between peripheral regions and middle and high classes in both cities. We can affirm that axis 2 distinguishes, in Recife, the neighborhoods (Casa Amarela and Campo Grande) with a predominance of households with 2 to 10 MW, and those with a monthly income over 10 MW (Aflitos, Graças, Derby, Boa Viagem, Jaqueira). In the case of São Paulo, axis 2 separates the sub-prefectures of Santana, Mooca daquelas de Vila Mariana, and Pinheiros, respectively. We can see here a difference in the social space that corroborates the principle proposed by Bourdieu: the social space differs, in the first dimension, according to the volume of capital and, in the second dimension, according to the compositional structure of capital (BOURDIEU, 2011).

TABLE 4 - Coefficients of correlation of variables and contribution for each axis.

Active variables	Axis 1	Axis 2	Axis 3
Population with no formal education and incomplete middle school	0.96	-0.11	0.18
The population of high school graduates and incomplete higher education	-0.24	-0.48	-0.68
The population of higher education graduates	-0.90	0.36	-0.12
Population self-declared black	0.87	0.14	-0.43
Population with 70 years old or more	-0.71	0.03	-0.40
Population with 15 to 24 years old	0.89	-0.06	-0.08
Public infrastructure	-0.10	-0.63	-0.47
Households with no sewage system	0.76	0.39	-0.23
Households with a monthly income until 2 MW	0.97	0.09	-0.14
Households with a monthly income between 2- 10MW	-0.22	-0.84	0.43
Households with a monthly income over 10MW	-0.89	0.40	-0.08

Source: created by the authors (2020).

Axis 2 distinguishes the peripheral neighborhoods in Recife and São Paulo, distancing the neighborhoods of Brejo da Guabiraba, Nova Descoberta da Ilha Joana Bezerra, Linha do Tiro, in Recife (Figura 1) and in São Paulo opposing more precarious peripheries, such as Parelheiros and Cidade Tiradentes, to more established ones, such as Ermelino Matarazzo or Pirituba. Axis 3 reaffirms the importance of high school diplomas in forming intermediary positions.

Summing up, we see through Figure 1, the extension of misery in Recife is much greater than in São Paulo. Regarding the wealthiest regions, in terms of economic and cultural capital, Recife and São Paulo have the same number of regions in these conditions. The two cities also differ by the proportion of regions and neighborhoods in intermediary situations, which are much more present in São Paulo.

We continue now with the examination of illustrative variables that enrichen the understanding of social space. They refer to the universe of "position-taking" and some properties of the population or territories. Thus, the notion of social space and the analysis of geometric data allow us to question to what measure life conditions are associated with the type of school investment or lack of. In Bourdieu's terms, the social space is also a space of possibilities, which can be seen through the use of geometrical analysis of data.

As we can perceive, the variables more correlated to the Axis 1 were illiteracy rates, dysfunction rate age/high school year, rate of high school dropout, as well as the rate of homicide and deaths of young people between 15 and 24 years old. The enrollment rate

in private education is negatively related to axis 1, followed by the rate of investment in higher education (enrollment in public and private higher education). Axis 1 can thus be understood as an axis of differences in terms of school investment. Axis 2 is defined by the variable enrollment in higher education and, with less intensity, to the variable women's formal job, reaffirming the relation perceived in other studies between higher educational investments and women's formal jobs.

FIGURE 3 - Circle of illustrative variables in São Paulo and Recife.
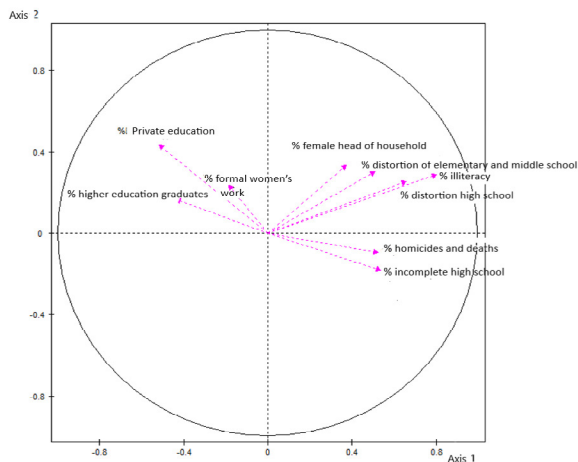
SOURCE: Created by the authors (2020)

The set of variables correlated to axis 3 also shows the importance of women's formal jobs in educational investments. Besides women's formal jobs, other variables are strongly correlated to axis 3: households headed by women, followed by the enrolment rate in higher education and the enrolment rate in private education.

TABLE 5 - Coefficients of correlation of illustrative variables and contribution to the axis.

Illustrative variables	Axis 1	Axis 2	Axis 3
Homicide and death rates between 15 and 24 years old	0.52	-0.09	0.30
Rate of formal women's job	-0.19	0.23	-0.64
Rate of female head of household	0.37	0.34	-0.76
Illiterate population over 15 years old	0.80	0.29	-0.38
Dysfunction rate age/middle school year	0.51	0.30	-0.70
Dysfunction rate age/high school year	0.65	0.25	-0.38
The enrollment rate in higher education	-0.44	0.17	-0.62
Population with incomplete high school	0.53	-0.18	-0.08
The enrollment rate in private high school	-0.52	0.43	-0.66

SOURCE: Created by the authors (2020).

The relation between "position-taking" and the position in social space is not mechanical. To Bourdieu, the relation between objective positions and position-taking would be measured more by habitus than the result of a "consciousness" in the terms of the Marxist tradition. That is, they are guided by dispositions that are the product of the incorporation of social structures without an explicit passage through consciousness (BOURDIEU, 2015, p. 105). Hence, when we understand school dropout before the end of high school as position-taking, we are not affirming that this is a free decision. Far from this, it is a "decision" that can only be considered when accounting for the position in the social space, which, in itself, defines a universe of possible "choices". Not by chance, in his courses, Bourdieu affirmed that the social space is also a space of possibilities (BOURDIEU, 2016). If the position-takings can only be understood concerning social space, they equally refer to the notion of habitus (BOURDIEU, 2011, 2016). Therefore, the notion of social space integrates several Bourdieusian concepts. It allows researchers to identify, for example, where the field of elite schools is in the cities. Despite the limitation of comparable data between both cities related to position taking, we can interpret the correlation between enrollment in private education and access to higher education as a disposition (or, if we prefer, habitus) toward the hyper-educational investment represented by the enrolment in private education.

In the Brazilian context, the access to higher education in 2010 is possibly due not only to private education but also to other policies to expand access to universities,

such as Reuni (2003) and Prouni (2004). Certainly, the availability of numbers about these two policies for the population of both cities could contribute to better mapping the educational strategies hidden in the rates of access to higher education. In another extreme of the cities, we call attention to the "position-taking" of incomplete high school, i.e., the decision to stop following secondary education, which is never independent of the objective conditions of life, inserts itself, as expected, in regions with more precarious conditions, once again, showing how the social space can be considered a space of possible (BOURDIEU, 2015; SAPIRO, 2020).

In previous articles, we analyzed separately, for São Paulo and Recife, the correlation between school dropout and homicide rate. We hypothesized that school stigma could predispose young people from the most precarious peripheral regions to illegal activities, leading to a more significant number of confrontations with the police, fights between rival groups, etc. (FERREIRA, 2019; PEROSA, LEBARON e LEITE, 2018). In the same way that the correlation between households headed by women and distortion age/school year in elementary, middle, and high school, PAC allows us to imagine new hypotheses that demand other studies, possibly qualitatively, so that we can reconstruct the logic of these correlations. We can then see the advantage of the Geometric Data Analysis. The description of the ensemble of social space allows the choice of particular case studies socially situated (neighborhoods, schools, etc.) or particular fields of the social space, such as elite schools.

A structural homology

The comparison between such different cities, as Recife and São Paulo, shows a structural homology, established of statistical regularities, from the available and pertinent variables to build social spaces, considering the two principles articulated by Bourdieu. The first principle would be the volume of capital captured in this study through axis 1, which opposes economic and cultural capital, which is strongly correlated in Brazil, the poorest and the richest regions. The second principle, according to Bourdieu, refers to the composition of capital, which was seen with axis 2, as it allows us to see the difference in the structure of capitals between social classes. We can see in the social space the first opposition. In the middle and high-class regions, the higher economic and cultural capitals and the city regions with the lower volume of these capitals. However, axis 2 allows us to see fractions of the social groups. We can see the smaller cultural and economic capital of the middle classes compared to those living in neighborhoods at the top of the social structure in both cities, allowing us to identify at least two great fractions of dominant groups. However, in Recife, this second axis refers to a few neighborhoods, while in São Paulo, we can see the same correlation in a much larger group of sub-prefectures in intermediary positions.

Likewise, we can see an important difference in the capital composition of the

people living in "peripheral" regions, the most precarious with almost no economic capital and low cultural capital, materialized in the rates of school failure and dropout. In another type of peripheral region, with a higher income, around 5 MW, and more significant cultural capital, we could consider a higher fraction of popular groups. This group has a high school diploma and the necessary dispositions. It is more aware of the opportunities to access higher education, in night courses at private colleges, free or cheap preparatory courses for college admission, or even studying online. They may also be more informed about the possibilities open by affirmative action policies in the last years. We could identify traces of an *illusio*, a disposition to invest in the school game. At the same time, the notion of social space does not let us forget the objective conditions in the most precarious regions of the city, which can lead to an early dropout of the educational system, or even a rebellion against it, as seen by Paul Willis (1991), which can be indicated by the rate of school failure. Hence, we can see that working with the notion of social space means being able to mobilize different fundamental notions of Bourdieusian sociology, such as capital, field, habitus, and position-taking, among others.

By identifying, through empirical research, the spaces with particular historical formations whose social structures are similar, our study shows the pertinence and the topicality for the Brazilian case. Social space, position-taking, social position, field, and habitus gain shape, despite the limitations of our statistics which do not always favor a direct and definite comparison. We should remind that the adjustments between the position in the social spaces and position-taking regarding the education system are not mechanical but probabilistic tendencies. The educational investments or disinvestments are points of view that the agent has from their objective positions and which are translated into incorporated dispositions, thus making the social space also a space of possible, of objective potentials, of "the best thing to do" in a given situation, in individual terms or even collective ones, as in social movements. Finally, we need to consider that our analysis depends on the measures used to build capital and social space indicators. The very broad and limited statistical measurements represent only the tip of the iceberg of Brazilian educational inequalities.

REFERENCES

ALMEIDA, Ana Maria F. et al. A educação privada na Argentina e no Brasil. *Educação e Pesquisa*. v. 43, n. 4, p. 939-956, 2017. Available at: https://doi.org/10.1590/S1517-97022017101177284. Accessed: May 19. 2022.

ALVES COIMBRA, Renan Marcelo. *Classe social, condições de vida, nível de instrução e desigualdade de saúde no Brasil*. (Master's dissertation in Social Sciences), Universidade Federal de Juiz de Fora, Juiz de Fora, 2017. Available at:.https://repositorio.ufjf.br/jspui/bitstream/ ufjf/4024/1/renanmarceloalvescoimbra.pdf. Accessed: May 19. 2021.

ATTIAS-DONFUT, Claudine. La vieillesse inégale. *Communications*, v. 37, n. 1, p. 125-136, 1983.

BAUDELOT, Christian; ESTABLET, Roger. *L'Élitisme républicain*. Paris, Seuil, 2009.

BOYER, Robert. L'anthropologie économique de Pierre Bourdieu. *Actes de la recherche en sciences sociales*, v. 150, p. 65-78, 2003.

BOUDON, Raymond. *L´inégalités des chances*. Paris, Armand Colin, 1973.

BOURDIEU, Pierre; PASSERON, Jean-Claude. *Les Héritiers*, Paris, Editions Minuit, 1964.

BOURDIEU, Pierre. *La distinction*. Paris, Seuil, 1979.

BOURDIEU, Pierre; CHAMPAGNE, Patrick. Les exclus de l'intérieur. *In: Actes de la recherche en sciences sociales*. v. 91-92, mars, p. 71-75, 1992.

BOURDIEU, Pierre. *La noblesse d'Etat*. Paris, Seuil, 1989.

BOURDIEU, Pierre. *Homo Academicus*. Trad. Ione Ribeiro Valle; Nilton Valle, Rev. Téc. Maria Tereza de Queiroz Piacentini. Florianópolis: Ed. da UFSC, 2011.

BOURDIEU, Pierre, *Sociologie générale: cours au Collège de France (1981-1983)*, v. 1, Raison d'Agir, Seuil, 2015.

COLEMAN, James. S. et al. *Report on Equality of Educational Opportunity*. U.S. Government Printing Office for Departement of Health, Education and Welfare, 1966.

DESROSIÈRES, A. *La politique des grands nombres*: Histoire de la raison statistique. Paris, La Découverte, 2000.

DUARTE, José Lins. *Recife no tempo da maxambomba (1867- 1889)*. Dissertação (Mestrado em História). Universidade Federal de Pernambuco, Recife, 2005.

FERREIRA, Daniela Maria. Schooling and living conditions in the city of Recife. *Psihologia Socialà 103*, v. 2, p. 29-47, 2019.

FREYRE, Gilberto. *Sobrados e Mocambos*. 3ª ed. Rio de Janeiro, José Olympio, 1961.

GIOVINE, Manuel; SOLACHE, Ana Antolín. El espacio de las escuelas secundarias de Córdoba capital: una caracterización multidimensional. *Revista Espacios en Blanco*. Tandil, Argentina, vol. 1, n. 33, 2017.

HASENBALG, Carlos; SILVA, Nelson do Valle. *Origens e destinos: desigualdades sociais ao longo da vida*. Topbooks. Rio de Janeiro, 2003.

HAUCHECORNE, Mathieu. Prises de position. *In:* Gisèle Sapiro (ed), *Dictionnaire international Bourdieu*. Paris, CNRS Éditions, 2020, p. 964.

LEBARON, Frédéric; LE ROUX, Brigitte. "Geometrie du champ". *Actes de la Recherche en Sciences Sociales*, v. 200, p.106-109, 2013.

LEBARON, Frédéric. *35 grandes notions de la sociologie*. França, Dunod, 2014.

LEBARON, Frédéric. *L'enquête quantitative en sciencesociale*s. Paris: Dunod, 2006.

LIMA, Marcia; RAMOS, Paula. Educação e políticas de promoção da igualdade racial no Brasil de 2003 a 2014. *Análise*, v. 31, 2017. Available at: https://library.fes.de/pdf-files/bueros/brasilien/13615.pdf. Accessed: Sept. 20. 2021.

MARQUES, Eduardo Cesar Leão. Estrutura Social e Segregação em São Paulo: Transformações na Década de 2000. *Dados.* v. 57, p. 675-710, 2014.

MERLE, Pierre. *La ségrégation scolaire.* Paris, La Découverte, 2012.

MORSE, Richard. *Formação histórica de São Paulo*. São Paulo, Editora: Difusão Européia do Livro, 1970.

OBERTI, Marco; PRÉTECEILLE, Edmond. *La ségrégation urbaine*. Paris, La Découverte, Collection Repères, 2016.

PEROSA, Graziela S.; LEBARON, Frédéric; LEITE, Cristiane. K. S. The space of socioeducational inequalities. *Psihologia Social*, v. 2, p. 93-111. São Paulo, 2018. Available at: https://hal.archives-ouvertes.fr/hal-03179010. Accessed: July 08. 2022.

PEROSA, Graziela. S.; DANTAS, Adriana. S. R. A escolha da escola privada em famílias dos grupos populares. *Educação e Pesquisa*, v. 43, p. 987-1004, 2017.

PEROSA, Graziela S. A passagem pelo sistema de ensino em três gerações: classe e gênero na segmentação do sistema de ensino. *Educação & Sociedade*. v. 31, n. 111, p. 391-409, 2010. Available at: https://doi.org/10.1590/S0101-73302010000200006. Accessed: July 12. 2022.

PEROSA, Graziela. S.; LEBARON, Frédéric.; LEITE, Cristiane. K. S. O espaço das desigualdades educativas no município de São Paulo. *Pro-posições*, v. 26, p. 99-118, 2015.

PRADO Jr, Caio. *História econômica do Brasil*. São Paulo: Brasiliense, 1994.

PIKETTY, Thomas. *Capital et Ideologie*. Paris: Editions Seuil, 2019.

PRÉTECEILLE, Edmond; RIBEIRO, Luiz César. Tendências da segregação social em metrópoles globais e desiguais: Paris e Rio de Janeiro nos anos 80*. Revista Brasileira de Ciências Sociais*, v. 14, n. 40, p.143-162, 1999. Available at: https://doi.org/10.1590/S0102-69091999000200010. Accessed: July 25. 2022.

RINGER, Fritz. E*ducation and society in modern Europe*. Bloomington: Indiana University Press, 1979.

RINGER, Fritz La segmentation des systèmes d'enseignement: Les réformes de l'enseignement secondaire français et prussien, 1865-1920. *Actes de la recherche en sciences sociales*, v. 149, p.6-20, 2003. Available at: https://doi.org/10.3406/arss.2003.2776. Accessed: July 15. 2022.

SANTOS, José Alcides Figueiredo. Classe social e desigualdade de saúde no Brasil. *Revista Brasileira de Ciências Sociais*, v. 26, p. 27-55, 2011.

SASSEN, Saskia. *The global city: New York, London, Tokyo*. New Jersey, Princeton University

Press, 2001.

SINGER, Paul. *Desenvolvimento Econômico e Evolução Urbana.* São Paulo, Editora Nacional, 1974.

SOUZA, Maria Angela de Almeida. *Recife:* Transformações na ordem Urbana. Rio de Janeiro: Letra Capital, 2015.

STIGLITZ, Joseph; SEN, Amartya; FITOUSSI, Jean-Paul. *Performances économiques et progrès social*. Paris, Odile Jacob, 2 t., 2009.

TEIXEIRA, Eliana de Oliveira; VARGAS, Hustana Maria. Tensionando os números: o Ensino Fundamental está mesmo universalizado para crianças e adolescentes negros?*Anais do 37º Congresso Nacional da ANPED*, Florianópolis, 2015. Available at: https://www.anped.org.br/sites/default/files/trabalho-gt21-3981.pdf. Accessed: Feb 20. 2022.

VARGAS, Hustana Maria. Cor e curso na interiorização de uma universidade federal. *Cadernos do Gea*, v.7, n.42, 2015. Available at: https://flacso.org.br/?publication=opiniao-n22-cor-e-curso-na-interiorizacao-de-uma-universidade-federal. Accessed: Oct 08. 2021.

WILLIS, Paul. *Aprendendo a ser trabalhador: Escola, Resistência e Reprodução Social*. Porto Alegre: Artes Médicas. p.241, 1991.

ZANCHETTI, Silvio Mendes. *O Estado e a Cidade do Recife (1836-1889)*. (Doctoral thesis in Architecture and Urbanism) - Universidade de São Paulo, São Paulo, 1989.

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