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UNEMPLOYMENT IN PRESENT DAY BRAZIL: TRENDS, CHARACTERISTICS AND PARTICIPATION IN UNPAID WORKS, BY SEX AND SCHOOLING

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ABSTRACT

To examine unemployment, both in terms of its rates and features, this article considers microdata from the Continuous Brazilian National Household Sample Survey (PNAD Contínua, in Portuguese abbreviation), focusing on the trends before, during, and after the crisis. Thus, assuming sex and schooling as fundamental concepts, this article analyzed unemployment in three complementary manners. First, according to its rates, we found that women were especially affected by the economic crisis, also showing fewer improvements due to the subsequent recovery. In addition, the period presented countercyclical behavior, considering the increase of the female workforce in the face of declining family income. With regard to schooling, men and women consistently presented higher unemployment rates in intermediary education levels, followed by lower rates for Incomplete Elementary Schooling and Complete Higher Education.

Second, this article discussed the characteristics of unemployment, specifically according to its duration and the main job search measures. Finally, we argued that a weakening of institutional and public strategies was accompanied, for both sexes, by an increase in direct contact with employers and a consolidation of interpersonal relationships. While less educated individuals tended to choose mediation by friends, relatives, or colleagues more frequently, more educated individuals showed a greater inclination for applying for public jobs. Regarding the duration of unemployment, the economic crisis once again generated consequences, taking into consideration the increase in long-term unemployment. As we showed, it was greater for women (despite a recent reduction in the gap between sexes) and for more educated individuals. It is worth remembering that for the two characteristics of unemployment analyzed, schooling was a significant predictor variable, although at different intensities.

Finally, the third part of this article investigated the participation of unemployed individuals in unpaid work, specifically domestic activities and care tasks. This dimension complements the active aspect of unemployment (job seeking, as an attempt to do productive activities), seeking to understand how the unemployed engage in reproductive work. As a result, we have shown that unemployment was responsible for increasing the frequency of female participation, while it was the opposite for men, even if unemployed individuals of both sexes presented more hours of dedication than employed ones. Finally, schooling presented contrary tendencies for men and women. The latter spent more hours per week for less-educated individuals, while the reverse was observed for men.

Through these efforts, we observed trends and features of Brazilian unemployment, which has recently reached historically high levels. As argued here, sex and education have complementary roles in the attempt to classify unemployed individuals, taking into account
family strategies and labor market opportunities, and considering both productive and reproductive activities.

Keywords: unemployment; schooling; sex

1. Introduction

According to the Committee for Economic Cycle Data, Brazil has undergone a severe recession between the second quarter of 2014 and the last quarter of 2016. The consequences for the labor market were notable, especially taking into account increases in income inequality and workforce underutilization. Currently, Brazil is experiencing a less encouraging economic scenario, varying between stagnation and timid recovery.

As a component of workforce underutilization, unemployment is a central theme in Brazilian academic debates. As we shall see, this indicator has presented an exponential growth following the crisis, which is only one of the aspects that draws our attention. Duration of unemployment, as well as the main measures for job seeking, underwent important transformations during this period.

To analyze unemployment, both in terms of its rates and features, this article considers microdata from the Continuous Brazilian National Household Sample Survey (PNAD Contínua, in Portuguese abbreviation), focusing on the trends before, during and after the crisis. Given this, we will make use of a quarterly analysis, considering the period between the first quarters of 2012 and 2019. More specifically, the article analyzes the data by sex and schooling, a choice grounded in the ways in which individuals are separated and hierarchized in the social life, especially in this case, within labor markets and family arrangements.

It is important to note that schooling and sex play complementary roles in the effort to categorize unemployed individuals. The first is frequently evoked as an indicator that allows us to distinguish jobless in their ability to mobilize resources in the labor market (BIAGI; LUCIFORA, 2008). This can happen in a more direct way, given that different careers present distinct educational requirements (each one with particularities, and affected differently by economic oscillations); or in an indirect and complementary manner, such as for Mincer (1991), since schooling is positively related to training and learning in the labor market, which is central

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1 The Committee is based in the Getúlio Vargas Foundation, and its Portuguese abbreviation is CODACE/FGV. On October 30, 2017, CODACE presented a report regarding the behavior of the Brazilian economy, which identified the periods that initiated and ended the crisis. The report can be accessed at the following link: <https://portalibre.fgv.br/data/files/F3/C1/F8/E8/A18F66108DDC4E66CA18B7AB/Comite%20de%20Data_o%20Ciclos%20Economicos%20-%20Comunicado%20de%2030%2010%202017%201_.pdf>

2 The PNAD is a research sample collected by the Brazilian Institute of Geography and Statistics (IBGE), which was permanently established in 2012. Among its objectives, the production and diffusion of data about the labor market, as well as the demographic characterization of the population, the analysis of levels of education and personal involvement in unpaid labor warrant noting. In such an inquiry, unemployment is derived from three other variables, in accordance with the understandings of the International Labor Organization (ILO): in the reference period, individuals of working age who were unemployed, available to work and actively seeking employment.
to most professions.

With this in mind, we have made a recategorization of the data set, establishing four educational levels: (i) individuals without Elementary School; (ii) those who Completed Elementary School; (iii) those who Completed High School; and (iv) those with Higher Education. The purpose was to reduce the categories under consideration\(^3\), facilitating the comparison and interpretation of the data. As a result, unemployed individuals were separated by educational profiles with institutional validity, guaranteed by a diploma.

On the other hand, sex is a fundamental criterion for the division of family roles. Hirata and Kergoat (2007) argue that the separation and valuation of daily activities define them as either productive or reproductive, respectively assigned (in general) to men and women. Such pattern of division of labor is fundamental to family strategies for accessing resources: as the active component of unemployment, job seeking is a productive activity, at least in its latent state, that competes with other reproductive activities in a daily routine. Thus, the decisions on enter or leave the workforce, for each individual, are based on mappings of opportunities and chances in labor market, evaluating the material constraints, the prospects for entering the workforce and the family demands.

For this reason, the present research also considers another set of questions, associated with the participation in unpaid family work. More specifically, we analyze the microdata from the PNAD from 2018\(^4\), investigating the involvement of unemployed individuals in domestic and care activities. We have treated such involvement as a dependent variable, comparing the frequency of involvement (participation rates and means of hours spent) for employed and unemployed people, as well as between sexes and educational levels. Notably, this aspect enters into dialogue with the research of Binns and Mars (1984), who examined unemployment in terms of its effect on the sexual division of labor.

With these goals in mind, this article is organized into three topics, all of them recognizing sex and schooling as important categories. Initially, we will analyze unemployment rates between the first quarters of 2012 and 2019. Following this, the second topic discusses the characteristics of unemployment, in terms of its duration and the main job search measures. Finally, the third topic considers participation in domestic and care activities.

2. Variation of unemployment rates by sex and schooling

Until the last quarter of 2014, Brazilian unemployment rates showed a relatively stable behavior, with a slight negative tendency, when it reached 5.5% of men and 7.7% of women (6.5% in total). Curiously, the second quarter of 2014, the starting point of a severe recession,

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\(^3\) Gathering together the seven levels in PNAD.

\(^4\) Unlike the quarterly PNAD, yearly PNAD has answers about unpaid works, which bases this decision.
wasn’t followed by substantial changes in these indicators. For this reason, the maintenance of historically low rates of unemployment until the last quarter of 2014 presents a paradoxical character in statistical studies, largely due to the decrease in the economically active population (COURSEIL, 2015).

However, as a result of the negative consequences of the crisis, and in accordance with a typical seasonal trend, the first quarter of 2015 is the bottom line of a continuous increase in unemployment. The apex of this growth was observed in the first quarter of 2017, when it reached 13.7% (12.1% for men and 15.8% for women). As indicated in Chart 1, the next quarters, taken together, close the temporal unit with a decrease, finishing the historical series with a male rate of 10.9%, female of 14.9% and a total of 12.7%.

![Chart 1](chart.png)

Unemployment rates for men, women and total population (2012-2019)

Source: Continuous PNAD, microdata. Elaborated by the author.

Particularly, the data illustrates a higher incidence of unemployment for the female workforce, in agreement with a tendency reported by the international literature\(^5\). According to Niemi (2006), it stems from the extensive inter-labor force mobility of women, that is, the mobility “in” and “out” of the economically active population, provoking frictional unemployment\(^6\). Nonetheless, the author argues that women tend to become active at peaks of economic cycles, searching for jobs during periods when chances or wages are favorable. But in Brazil the opposite trend was observed: between the last quarter of 2014 and the first quarter of 2017, obviously a bad period to venture into the job market, the female workforce

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\(^5\) Gallie and Paugam (2000), for example, verified such a pattern in several European countries in the 1990s.

\(^6\) In addition, intra-labor force immobility reduces the possibility of changing or entering professions. Niemi (2006) also highlights the lack of specific training for women, even if this aspect has less of an impact than the others.
increased 1.6 p.p., while there was a 0.2 p.p. decrease for men\(^7\). As in the 1990s, this was a result of a countercyclical behavior of women, who tried to compensate for the decline in family income (MONTALI, 2006).

Therefore, notable differences can be observed before and after the crisis. Throughout this period, a mean of 3.03 p.p. separates unemployment rates for men and women, with the biggest differences located at the extremes of the chart (4 p.p.). Accompanying the reported increase of the female workforce, this difference went from 2.2 p.p. in the last quarter of 2014 to 3.7 p.p. in the first quarter of 2017\(^8\). Subsequently, if the male unemployment rate dropped 1.2 p.p. until the first quarter of 2019, the respective retraction was 0.9 p.p. for women, revealing that the timid economic recovery provoked distinct impacts for the sexes.

Aiming to deepen these reflections, Chart 2 presents the evolution of unemployment at each education level. As can be seen, at all levels, female unemployment was greater than male, while the rankings for sexes were identical. For both, Complete Elementary Schooling presented the highest unemployment rates, followed by Complete High Schooling, Incomplete Elementary Schooling and Complete Higher Education. This pattern was observed in previous data by Fraga and Dias (2007), for whom the association between unemployment and schooling in Brazil (measured in years of study) was not linear, with an inverted “U” format. As a result, unemployment is higher at intermediate levels of schooling, and lower at the extremes (unemployed individuals without education or with a University diploma).

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\(^7\) From 49.4 to 48% for women; and from 27.8 to 28% for men.

\(^8\) Curiously, this trend was the reverse of that noticed during the Greek crisis, where the gap in unemployment rates between the sexes had diminished, as a result of the concentrated impact of the economic collapse on male-dominated sectors (KARAMESSINI; KOUTENTAKIS, 2014).
Three trends are visible in the historical series. First, at all schooling levels, a relative stabilization of unemployment rates was observed until the last quarter of 2014. Next, we saw a substantial increase of unemployment between the first quarters of 2015 and 2017, which was the case for all schooling levels, and particularly for those with the highest previous indices (individuals with Elementary Schooling and High Schooling). Lastly, the final quarters presented a stabilization in unemployment, with slight growth observed for men with University education.

It is notable that the gap in unemployment rates between schooling levels increased during the period. If we compare the two extremes of Chart 2, it is true for almost all of them: between Complete Elementary Schooling and Complete High Schooling, they increased 2.1 p.p. for men and 1.9 p.p. for women; between Complete High Schooling and Incomplete Elementary Schooling, men remained stable, while 0.7 p.p. was observed for women. Between Incomplete Elementary Schooling and Complete Higher Education, a difference of 2 p.p. for men and 2.3 p.p. for women was found. As a result, the referred trend, based on the concentration of unemployment in intermediary schooling levels, was strengthened for both sexes during the period.

We should emphasize that this pattern is not a global one. At the end of the last century, there was a strong relationship between schooling and unemployment rates in Britain, expressing a linear and negative effect up to 12 years of study (NICKELL, 2002). In France

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9 In this period, the unemployment rate increased by 7.8 p.p. and 9.6 p.p. for men and women with Complete Elementary Schooling, respectively; 5.7 p.p. and 6.9 p.p with Complete High Schooling; 5.5 p.p. and 6.3 p.p. without Elementary Schooling; and 2.2 p.p. and 2.6 p.p with Higher Education.
10 Which went from 5.5 to 5.6%.
11 From that point, the relationship weakens.
and Germany, Lauer (2005) pointed similar findings. Such a straightforward linear relation contrasts with the fragmented one observed in Brazil, which instigates reflection, especially regarding the low unemployment rates for unskilled workers. Considering this aspect, we could argue that this group benefits from a significant job demand in Brazil, while, in OECD countries, it has undergone steady reductions since the 1980s (Nickell; Bell, 2014).

3. Characteristics of unemployment

For Bowers and Harkess (1979), labor market prospects for individuals and groups are best represented by the duration of unemployment, more than by its volume. Once again, this parameter will be divided according to sex and level of education.

Between the first quarter of 2012 and the last quarter of 2014, a concentration of unemployment in its intermediate durations was observed. In this period, the percentage of individuals who were unemployed for less than 1 month went from 14.8 to 11.9%, a fall accompanied by unemployment for 2 years or more (23.2 to 17.8%). By contrast, unemployment from 1 month to less than 1 year grew by 5.2 p.p. (49 to 54.2%), and that from 1 year to less than 2 years by 3.1 p.p. (13 to 16.1%).

Next, indices presented a gradual increase in long-term unemployment until the initial quarter of 2017, as a direct consequence of the economic crisis. If the first category remains virtually stable (-0.4 p.p.) and the second drops 4.8 p.p., unemployment from 1 year to less than 2 years grew by 2.2 p.p. (from 15.8 to 18%), while that for 2 years or more went from 17.4 to 20.4% (3 p.p.).

Nevertheless, the interim between the first quarters of 2017 and 2019 presents a more intriguing behavior. Contrary to the beginning of the historical series, the frequencies increase at the extremes, going from 12.4 to 15.7% for unemployment of less than 1 month; and from 20.4 to 24.8% for 2 years or more, a trend balanced by a proportional decrease in the other two categories.

Considering this theme, Chart 3 presents the data by sex, adding an aggregate variable that synthesizes 1 year or more of unemployment.

Chart 3
Duration of unemployment for men and women (2012-2019)

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12 Trend observed up until intermediate schooling.
13 Commonly, long-term unemployment is referred to as a period of longer than 1 year. But in PNAD, the categorical variable that allows us to elaborate this new category includes unemployment for 1 year. Thus, in this article the expression “long-term unemployment” considers unemployment of 1 year or longer.
14 Going from 49.2 to 45.4% in unemployment from 1 month to less than 1 year, and from 18 to 14.1% in unemployment for 1 year or longer.
Notably, both sexes reproduce the periodical tendency noted above\textsuperscript{15}, while the chart also shows longer durations for women. This pattern is widely observed in the literature, such as in Lauer (2005). In an explanatory effort, Barrett and Morgenstern (1974) argue that the longer time required for women to find jobs was due to having to balance job seeking (in a less intense way than for men) and domestic and child care. In the next topic, this aspect will be discussed further.

However, in contemporary Brazil, one aspect should be emphasized. If the disparity in long-term unemployment between the sexes continued across the historical series, its value diminished: between the first quarter of 2012 and the first quarter of 2019, men unemployed for 1 year or longer went from 28.1 to 33.4%, while levels for women were, respectively, 42.7 and 43.8%. As a result of a substantial growth in the indicator for men, together with a

\textsuperscript{15} The only disparity concerns the increase in unemployment of less than 1 year, for women, between the first quarters of 2015 and 2017, when it went from 10.2 to 11%. During this period, the indicator decreased in the total population.
stabilization at high levels for women, the distances gradually fell from 14.6 p.p. to 10.4 p.p. in the period under examination.

From now on, we will analyze the behavior of the variable between different educational profiles, focusing on the early quarter of 2019\textsuperscript{16}. Here, the first step was to carry out a $\chi^2$ test, comparing the observed frequencies for the duration of unemployment (of, in categorical variables) with the expected frequencies in a null hypothesis scenario ($ef$)\textsuperscript{17}, taking education levels as an explanatory variable. Then, the $\chi^2$ test allows us to determine the proximity or disparity between these frequencies, defining a formula as follows:

$$
\chi^2 = \sum \frac{(of - ef)^2}{ef}
$$

The test confirms that schooling is a significant variable to predict the time an individual remains unemployed ($p < 0.01$). Yet, this finding should be extended by performing a Cramer’s $V$, commonly used to measure the intensity of the association between categorical variables. As an output, the test produces a value between 0 and 1, where values closer to 0 indicate weak association while those closer to 1 indicate strong associations. Thus, Cramer’s $V$ ($V$) is based on the $\chi^2$ test, as well as the number of elements ($n$) and the lower value between the number of lines and the number of columns in a contingency table ($k$):

$$
V = \sqrt{\frac{\chi^2}{n \cdot (k - 1)}}
$$

Schooling presented an almost negligible value for the test (0.063)\textsuperscript{18}. In other words, while there are differences for duration of unemployment between schooling levels, the influence is extremely low. Even so, it is important to recognize that Complete Higher Schooling is likely responsible for the highest incidence of unemployment for 2 years or more (27.5%),

\textsuperscript{16} However, some longitudinal observations for long-term unemployment can be stated: at all schooling levels, these rates increased for men between the first quarter of 2012 and the first quarter of 2019. Even if slowly, the indicator passed from 24.6 to 27.4% in Incomplete Elementary Schooling (growth of 2.8 p.p.); from 27.7 to 29.5% in Complete Elementary Schooling (1.8 p.p.); from 31.1 to 38.5% in Complete High Schooling (7.4 p.p., the largest increase); and from 33.2 to 40.2% in Complete Higher Education (7 p.p.). For women, the data showed more stable behavior, since the greatest variation was 3.7 p.p. in Complete High Schooling. Further, it is notable that the other schooling levels dropped for this indicator during the period: in Incomplete Elementary Schooling by 1.9 p.p. (44.7 to 42.8%), in Complete Elementary Schooling by 0.6 p.p. (42 to 41.4%) and in Complete Higher Education by 2.1 p.p. (43.6 to 41.5%).

\textsuperscript{17} After the calculation, the result, with the degrees of freedom (quantity of lines less 1, divided by the quantity of columns less 1) in a contingency table, define a $p$-value. In the present article, an association between variables is considered significant when the value is less than 0.05, that is, when there is less than 5% chance of a Type 1 error occurring (a null hypothesis is true but is rejected).

\textsuperscript{18} Further, we carried out tests for other periods, and in all of them the values were equally low: in the first quarters of 2012 and 2017 (as the beginning of the historical series and the period right after the crisis), the values were, respectively, 0.046 and 0.052.
while 22.4% was reported for Incomplete Elementary Schooling, presenting the lowest frequencies for this duration. On the other hand, 20.5% of individuals without Elementary Schooling experienced unemployment for less than 1 month, versus 12% unemployment for those with University education.

The numbers reflect, even if slightly for this data set, higher occupational mobility at lower educational levels, partially due to the urgency of the need for entry into the labor market. By contrast, more educated individuals tend to be more careful when searching for employment, taking into account their wishes and waiting for opportunities with better wages. Kettunen (1997) observed similar results in Finland during the 1990s, finding that employment that requires a high level of education was, in general, scarce and spread out within a territory, which occasionally imposes difficulties for skilled workers in searching for jobs, such as the need to move home. In complement, the lower cost of hiring unskilled workers, as well as their ability to undertake a wider variety of elementary jobs, provoke a shortening of the duration of unemployment for this group (NICKELL, 2002).

Dividing the data by sex, the variation between schooling levels remains low, with 0.086 and 0.053 for Cramer’s V, for men and women, respectively. As presented in Table 1, women showed higher levels of long-term unemployment at all educational levels, while it is possible to observe the opposite for men. But it should be noted that Complete Higher Education, and to a lesser extent Complete High Schooling, are responsible for a reduction in the distance between the sexes, with almost identical values in some intersections.

### Table 1
Duration of unemployment by schooling and sex (2019.1)

<table>
<thead>
<tr>
<th>Duration of unemployment</th>
<th>Incomplete Elementary Schooling</th>
<th>Complete Elementary Schooling</th>
<th>Complete High Schooling</th>
<th>Complete Higher Education</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>Less than 1 month</td>
<td>24.8%</td>
<td>14.3%</td>
<td>22.8%</td>
<td>13.6%</td>
</tr>
<tr>
<td>From 1 month to less than 1 year</td>
<td>47.7%</td>
<td>42.4%</td>
<td>47.9%</td>
<td>44.9%</td>
</tr>
<tr>
<td>From 1 year to less than 2 years</td>
<td>9.9%</td>
<td>13.8%</td>
<td>12.9%</td>
<td>15.2%</td>
</tr>
<tr>
<td>2 years or more</td>
<td>17.6%</td>
<td>29.4%</td>
<td>16.4%</td>
<td>26.3%</td>
</tr>
</tbody>
</table>

Source: Continuous PNAD, microdata. Elaborated by the author.

Complementing these findings, the analysis also directs our attention to the main measures of job searches, fundamental to understanding the different strategies used while

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19 However, the author presents some countervailing tendencies to this observation, such as the choice of skilled workers to undertake unskilled labor while unemployed.
unemployed. Although this theme has been neglected in statistical studies, a notable exception is the research of Guimarães et al. (2017). The classification made by the authors for the modalities of job seeking is useful to compare groups and quarters, and for this reason, it will be applied here.

Below, Chart 4 presents the levels during the interim under examination. Unfortunately, there was a methodological shift in the last quarter of 2015, which provokes certain changes in the data, especially an increase in contact with the employer\textsuperscript{20}. But even given this shift, we can say that economic crisis has led to an intensification of such initiatives for both sexes, and especially for women.

Therefore, until the last quarter of 2014, stability in contact with employers was observed. However, in the first three quarters of 2015, men presented growth of 2.6 p.p. (from 59.2 to 61.8\%), and women of 2.3 p.p. (from 55.1 to 57.4\%). It is important to note that these increases continued after the methodological shift: between the last quarter of 2015 and the first quarter of 2017, they were 7.2 p.p. (71.3 to 78.5\%) and 10.8 p.p. (68.7 to 79.5\%), respectively.

\textbf{Chart 4}

Main job search measures for men and women (2012-2019)

\footnotesize
\begin{itemize}
\item Other
\item Job ads
\item Self employment
\item Personal networks
\item Sought institutions
\item Applied for a public job
\item Established contact with the employer
\end{itemize}

\textsuperscript{20} Since the last quarter of 2015, PNAD includes new modalities of contact with employers (for example, by e-mail), which increased the frequencies of this category.
To understand these results, one aspect of PNAD deserves attention: its survey does not capture the effectiveness of the measures themselves, but only which of the options was considered the most relevant during a specific month. That said, we can observe that some strategies (such as application for public jobs or use of job seeking agencies) assume a sporadic or diffuse character over a long period of unemployment. Additionally, informal assistance depends on the flow of information and favors between unemployed individuals and their friends and family. Direct contact with employers on the other hand represents, in a largely unfavorable scenario, an attempt to sustain a constant connection with the labor market, even if from a distance (by email, for example) or in the face of rejections.

Considering the other job search measures, and focusing on the period after the methodological shift, we note some important changes. First, a decrease in institutional engagement, that dropped from 7.5 to 4.3% for men and from 9.6 to 4.5% for women. Second, job notices lost almost all their importance, falling from 5.3 to 0.7% and from 5.6 to 0.9% for men and women, respectively. And thirdly, applications for public jobs went from 2.6 to 2.1% for men, and dropped markedly from 5.1 to 3.3% for women.

So, to a more general transformation (the reduction in the importance of newspapers), it was observed a decrease in job seeking with institutional support, from private or public. This trend was balanced out by a growth in direct contact with employers, as well as by a stabilization of the use of interpersonal and informal relationships. The last, synthesizing mutual help among friends, relatives and colleagues, finished the historical series with 11.9% for men and 8.5% for women.

As before, we focus now on the first quarter of 2019, making use of inferential and descriptive statistics to evaluate the association between schooling and job seeking. In this way, the $x^2$ test once again shows a significant association ($p < 0.01$), while Cramer’s V
Presented moderate to low intensity (0.181). In summary, the largest discrepancies were observed in applications for public jobs, which contrasted 0.4% of individuals without Elementary Schooling and 12.9% of those with Higher Education; and in the contact with relatives, friends and colleagues, with 21.8% reported for individuals without Elementary Schooling and 4% for those with Higher Education.

Breaking down the data, men and women presented a significant association between the two variables ($p < 0.01$), with similar values for Cramer’s V (0.183 and 0.172, respectively). As presented in Table 2, both sexes reproduced the tendency above, with higher values for personal networks for less educated individuals; and greater applications for public jobs for individuals with Higher Education.

<table>
<thead>
<tr>
<th>Main measures of job search</th>
<th>Incomplete Elementary Schooling</th>
<th>Complete Elementary Schooling</th>
<th>Complete High Schooling</th>
<th>Complete Higher Education</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>Established contact with the employer</td>
<td>71.4%</td>
<td>73.7%</td>
<td>80.5%</td>
<td>82.2%</td>
</tr>
<tr>
<td>Applied for a public job</td>
<td>0.2%</td>
<td>0.6%</td>
<td>0.5%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Sought institutions</td>
<td>3.5%</td>
<td>3.7%</td>
<td>5%</td>
<td>5.6%</td>
</tr>
<tr>
<td>Personal networks</td>
<td>23.3%</td>
<td>19.7%</td>
<td>11.3%</td>
<td>8.5%</td>
</tr>
<tr>
<td>Self-employment</td>
<td>0.9%</td>
<td>1.6%</td>
<td>1.2%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Jobs ads</td>
<td>0.4%</td>
<td>0.6%</td>
<td>0.8%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Other</td>
<td>0.3%</td>
<td>0.2%</td>
<td>0.8%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Source: Continuous PNAD, microdata. Elaborated by the author.

Furthermore, contact with institutions and employers at intermediary educational levels was more frequent, as well as more frequent self-employment at higher educational levels. Between the sexes, men presented higher rates for personal networks at almost every educational level, when women showed the same for the others categories (with some balance in the contact with the employer). Certainly, part of this tendency can be credited to the differences in schooling between men and women.  

4. Domestic and care tasks

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21 In the first quarter of 2019, 27.9% of unemployed men did not have Elementary Schooling, 23.4% had Complete Elementary Schooling, 41% had Complete High Schooling and 7.7% had Complete Higher Education; on the other hand, 16.8% of unemployed women did not have Elementary Schooling, 19.8% had Complete Elementary Schooling, 50.5% had Complete High Schooling and 12.9% had Complete Higher Education.
While unemployment relates to an absence of productive and paid activities, reproductive work ensures the necessary conditions for the generation and growth of individuals, mobilizing affective and material protection, especially within families. In this topic, we will examine two modalities of this unpaid work, focusing on 2018: domestic work, directed to the physical space of households; and care work, whose objective is the well-being of dependent individuals (children, the elderly, disabled and the sick). Therefore, we seek to answer: what the unemployed individual does in addition to job seeking?

With this in mind, we assume the following hypothesis: i) for men and women, unemployment raises the rates and the intensity of involvement in unpaid work; and ii) unemployed and less-educated women present higher rates of participation, as well as hours spent in a week on domestic and care tasks. It is relevant to note that the last hypothesis dialogues with research by Bruschini (2006), which presented similar findings for an older database.

Surprisingly, however, employed men reported greater involvement in domestic activities than unemployed men, with 82.5 and 80.6% participation, respectively. In reverse, employed women reported 94.9% participation in domestic activities while unemployed women reported 95.6%. Regarding care tasks, this pattern was observed again: 28.8% of employed men participated in these activities, contrasting with 25.1% of unemployed men. The rates for women were 35.3 and 41%, respectively.

In addition to participation, we should also consider the intensity of the unpaid work taken together, specifically in terms of hours spent per week. Here, unemployed men dedicated themselves 12.62 hours per week, 2.32 hours more than employed men. Unemployed women, also reported more participation, with 22.53 hours against 18.49 hours for employed women.

Concluding, the hypothesis i was partially rejected. If unemployment increases rates of female participation in unpaid work, the opposite was seen for men. But for individuals already engaged in such activities, unemployment increases the number of hours spent per week, for both sexes.

Next, Table 3 classifies the rates of participation by schooling. Using the \(x^2\) test, we found a significant association between domestic activities and educational levels \((p < 0.01)\), but Cramer’s V highlighted extremely low values \((0.059\) for men and 0.061 for women). Using a descriptive approach, it becomes relevant that the sexes demonstrate different trends: while the male participation rate increases with schooling, the female rate decreases. Although it is not possible to measure the causes by PNAD, it is coherent to affirm that in female cases, this trend is related to the hiring of domestic workers by wealthier families. For men, participation in domestic activities is a well-liked behavior in more educated groups. These reflections, however, should be considered in relation to other empirical findings.

The \(x^2\) test also demonstrates a significant association between care tasks and
schooling ($p < 0.01$), with different magnitudes for Cramer’s $V$ (0.041 for men and 0.102 for women). It becomes relevant that there is, for both sexes, a trend toward decreased participation rates at higher education levels, possibly due to the use of private institutional assistance (in a country with a deficit in public services), such as daycare centers, nursery schools and rest homes.

Lastly, it is necessary to consider more closely the variation in hours spent in unpaid work between education levels, for both sexes. For this, we have to measure if belonging to one of these educational levels (independent variable) affects an individual’s dedication to unpaid activities (dependent variable). Thus, an $F$-statistic of an Analysis of Variance (ANOVA) is the ratio between the estimated variance between groups (left) and the estimated variance for each group (right).

$$F = \frac{\sum_{j=1}^{k} n_j (\bar{X}_j - \bar{X})^2}{k - 1} \Bigg/ \frac{\sum_{j=1}^{k} \sum_{i=1}^{n_j} (X_{ij} - \bar{X}_j)^2}{n - k}$$

The following contingency tables present the results:

### Table 3
Participation rates for household and care tasks, for men and women by schooling (2018)

<table>
<thead>
<tr>
<th>Modalities of unpaid works</th>
<th>Incomplete Elementary Schooling</th>
<th>Complete Elementary Schooling</th>
<th>Complete High Schooling</th>
<th>Complete Higher Education</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>Household activities</td>
<td>78.7%</td>
<td>97.8%</td>
<td>79%</td>
<td>95.6%</td>
</tr>
<tr>
<td>Care tasks</td>
<td>27.2%</td>
<td>46.4%</td>
<td>26.2%</td>
<td>45.7%</td>
</tr>
</tbody>
</table>

Source: Continuous PNAD, microdata. Elaborated by the author.

### Table 4
Analysis of Variance (ANOVA) of hours spent per week by education levels, for men and women (2018)

<table>
<thead>
<tr>
<th>Sum of squares between groups</th>
<th>Sum of squares in groups</th>
<th>Degrees of freedom between groups</th>
<th>Degrees of freedom in groups</th>
<th>Variance between groups</th>
<th>Variance in groups</th>
<th>$F$-Statistics</th>
<th>Sig</th>
</tr>
</thead>
</table>

22 The only exception is men with Complete Higher Education, whose rates are 1 p.p. higher than men with Complete High Schooling.

23 Where $k$ is the number of samples; $n_j$ is the number of elements in the sample $j$; $\bar{X}_j$ is the mean of sample $j$; $\bar{X}$ is the big mean; $X_{ij}$ is the $i$-th observation in sample $j$.

24 It is important to note that the degrees of freedom between groups are calculated by $k - 1$ ($k$ = number of groups), and the degrees of freedom in groups are calculated by $n - k$ ($n$ = number of observations).
In summary, schooling is an important variable to predict the intensity of participation in unpaid works, for men ($p < 0.01$) and women ($p < 0.001$). This finding is consistent with the data: for both sexes, the least hours spent per week were observed for Complete Elementary Schooling (12.14 hours for men and 21.98 hours for women). But for men, Complete Higher Education showed the highest levels (13.69 hours), while for women the same was true for Incomplete Elementary Schooling, with a notable variation (24.45 hours)\textsuperscript{25}.

As a result of these combined findings, hypothesis \textit{ii} was confirmed, with unemployed women presenting the highest rates of participation and hours spent per week in domestic and care activities.

5. Conclusions

Assuming sex and schooling as fundamental concepts, this article analyzed unemployment in three complementary manners. First, according to its rates, we found that women were especially affected by the economic crisis, also showing fewer improvements due to the subsequent recovery. In addition, the period presented a countercyclical behavior, considering the increase of the female work force in the face of declining family income. With regard to schooling, men and women consistently presented higher unemployment rates in intermediary education levels, followed by lower rates for Incomplete Elementary Schooling and Complete Higher Education.

Second, this article discussed the characteristics of unemployment, specifically according to its duration and the main job search measures. We argued that a weakening of institutional and public strategies was accompanied, for both sexes, by an increase in direct contact with employers and a consolidation of interpersonal relationships. Compared to each other, while less educated individuals tended to choose mediation by friends, relatives or colleagues, more educated individuals showed a greater inclination for applying for public jobs. Regarding the duration of unemployment, the economic crisis once again generated consequences, taking into consideration the increase in long-term unemployment. As we showed, it was greater for women (despite a recent reduction in the gap between sexes) and

\textsuperscript{25} The complete counts are the following: men without Elementary Schooling spent 12.78 hours per week; those with Complete Elementary Schooling, 12.14 hours; those with Complete High Schooling, 12.59 hours; and those with Complete Higher Education, 13.69 hours. Meanwhile, women without Elementary Schooling spent 24.45 hours per week; those with Complete Elementary Schooling, 21.98 hours; those with Complete High Schooling, 22.04 hours; and those with Complete Higher Education, 22.49 hours.
for more educated individuals. It is worth remembering that for the two characteristics of unemployment analyzed, schooling was a significant predictor variable, although at different intensities.

Finally, the third part of this article investigated the participation of unemployed individuals in unpaid work, specifically domestic activities and care tasks. This dimension complements the active aspect of unemployment (job seeking, as an attempt to do productive activities), seeking to understand how the unemployed engage in reproductive work. As a result, we have shown that unemployment was responsible for increasing the frequency of female participation, while it was the opposite for men, even if unemployed individuals of both sexes presented more hours of dedication than employed ones. Furthermore, schooling presented contrary tendencies for men and women. The latter spent more hours per week for less-educated individuals, while the reverse was observed for men.

Through these efforts, we observed trends and features of Brazilian unemployment, which has recently reached historically high levels. As argued here, sex and education have complementary roles in the attempt to classify unemployed individuals, taking into account family strategies and labor market opportunities, and considering both productive and reproductive activities.

6. References


