



Gender inequality in paid and unpaid work during Covid-19 times

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Abstract: We employ real-time household data to study the impact of the pandemic lockdown on paid and unpaid work in Spain. We document large employment losses that affected more severely low-skilled workers and to some extent college educated women. We show that the pandemic resulted in an increase in the gender gap in total hours worked, including paid and unpaid work. This is due to the smaller decrease in paid work hours among women that was not compensated by a smaller increase in unpaid work. We also examine the impact of the lockdown on within-household specialization patterns. We find that while men slightly increased their participation in home production, the burden continued to be borne by women, irrespective of their labor market situation. This evidence suggests that traditional explanations cannot account for the unequal distribution of the domestic workload. Additional analysis supports gender norms as a plausible explanation for our findings.

Keywords: Covid-19, labor market, household work, childcare, gender.

JEL codes: D13, J13, J16.

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1. Introduction

The Covid-19 pandemic altered the normal functioning of labor markets and the organization of family life. The outbreak in most industrialized countries in early 2020 led to important employment losses and forced a large fraction of the workforce to work from home. In addition, the closure of educational centers and the impossibility to outsource domestic services represented an unprecedented increase in home production that could only be absorbed by family members.

Spain is an interesting case study as it was hit early and hard by the new virus and suffered one of the strictest lockdowns in Europe. In a matter of hours, life across the entire country changed from business-as-usual to nearly complete home confinement for non-essential workers. To contain the dramatic spread of the virus, on March 14, 2020, the government announced that effective in 24 hours, Spain would enter into a “state of alarm”. The state of alarm entailed a nationwide lockdown, closing all educational facilities and banning all trips that were not of absolutely necessity. Residents were ordered to stay home except to buy food or medicine, go to work, go to the hospital, or other emergencies. From April 26, 2020, the mobility restrictions were progressively lifted, and the state of alarm ended by June 21, 2020. Regular educational activities were resumed by mid-September.

To investigate the effects of these particularly stringent containment measures put in place during the first spike in Covid-19, we ran an internet-based survey on a representative sample of 5,000 individuals in May of 2020. In this paper, we employ this newly collected data to document the impact of the pandemic lockdown on paid and unpaid work across genders. We show that the pandemic represented important job losses for both men and women, and that the increase in domestic time demands was equally absorbed by both family members. However, we identify an increase in the gender gap in

total work hours resulting from a smaller decrease in the number of hours in paid work and a larger increase in hours devoted to unpaid work among women. The outbreak of the pandemic and the measures adopted to contain the expansion of the virus represented a gender-symmetric shock in terms of employment, but asymmetric in terms of the distribution of unpaid work.

We also find that the lockdown had a negligible effect on the gendered specialization pattern within households, as women continued to bear a larger share of the domestic workload irrespective of their situation in the labor market. Only in non-traditional families (i.e. those with an egalitarian pre-lockdown distribution of home production) was the employment situation of both members relevant in determining the distribution of domestic tasks during lockdown. In traditional families, we find suggestive evidence that the gender of the spouse whose working situation changed during lockdown had a differential effect on changes in the allocation of household tasks, being detrimental to women. Our findings suggest that the presence of social norms rather than differences in time availability or bargaining power are better suited to understand the gendered specialization patterns observed among Spanish households.

We contribute to an emerging literature on the effects of the Covid-19 crisis on labor markets and gender inequality. We are part of a small group of studies that collected detailed, representative survey data during the confinement period in the Spring of 2020. A strength of our data is that it contains parallel information on standard labor market variables as well as childcare and housework time, including the within-household distribution of tasks, information that is not collected in standard labor force surveys. We ask respondents about their own time allocation as well as their partners', both at the time of the survey and (retrospectively) right before the lockdown. Given the abrupt and extreme measures taken in Spain at this time, in addition to documenting changes in paid

and unpaid work, we are able to make use of variation in time availability that is unrelated to worker productivity to estimate the impacts on the domestic workload distribution. Our results stress the effect of Covid-19 on within-household specialization, which could potentially have long-term effects on employment and time allocation by gender.¹

The remainder of the paper is organized as follows. Section 2 describes the economic context and related literature, while Section 3 describes the specifics of the lockdown in Spain. In Section 4 we provide the details of the data collection. We present the empirical strategy in Section 5 and discuss the main results in Section 6. In Section 7, we conclude with some final remarks.

2. Background and economic context

Several recent papers have documented the labor market effects of the first wave of the pandemic in different countries.² Alon et al. (2020) study the impact of the recession on the unemployment rate of men and women in the US. Adams-Prassl et al. (2020) analyze the short-term labor market impact in the US, the UK and Germany, while Foucault and Galasso (2020) use real-time survey data for representative samples for twelve countries.³

Our work is most related to those studies that also document changes in non-market work by gender. Biroli et al. (2021) collect data similar to ours for Italy, the US and the UK (although with smaller sample sizes, and a non-representative survey for Italy). They also combine information on labor market status and home tasks and obtain results along similar lines to ours. Sevilla and Smith (2020) and Andrews et al. (2020) for the UK, Prados and Zamora (2021) and Carlson et al. (2020) for the US, Boll et al. (2021) for Germany and Del Boca et al. (2020) for Italy, each find that men may increase housework

¹ See Farré and González (2019) and Patnaik (2019) for the effect of the introduction of paternity leave on time use and employment decisions of family members.

² See Farré et al. (2020) for an early literature review.

³ Australia, Austria, Brazil, Canada, France, Germany, Italy, New Zealand, Poland, Sweden, the UK and the US.

and childcare in some cases, but women still shoulder a higher share of unpaid domestic work. Evidence using COME-HERE data, collected for France, Germany, Italy, Spain and Sweden, during the pandemic, confirms the unequal distribution of household tasks and childcare across genders during the pandemic, with women enjoying less leisure time than men, and suffering more adverse consequences in terms of mental health, albeit subject to differences across countries (Vögele et al., 2020).⁴

Given the pre-pandemic context in Spain, differential responses by gender to altered domestic demands during the lockdown is not surprising. Despite significant gains during the last few decades, gender differences in Spain are still significant. In 2019, the female labor force participation rate was more than 10 percentage points below that of men (64.3% versus 53.3%) and women were over-represented in part-time jobs (6.2% versus 21.6%). As in most Southern European countries, fertility in Spain is well-below the replacement rate at 1.3, and women devote a disproportionately larger amount of time to home production (i.e. 5 hours per day by women versus 2.4 by men).⁵ In this context, one would predict that the outbreak of the pandemic, characterized by large employment losses in highly feminized sectors and an unprecedented increase in home production, may have exacerbated the existing gender differences in paid and unpaid work (Alon et al., 2020).

Beyond documenting changes in paid and unpaid work by gender (both overall and within the household), we also build off of the existing literature by testing potential explanations for these findings. Traditional models of within-household specialization would predict that the existence of comparative advantages and/or bargaining power of the family members determine their contribution to home production (Becker, 1985;

⁴ As far as we are aware, this is the only other study that collects data during this time for Spain. See <https://pandemic.uni.lu> for more details on COME-HERE (Vögel et al., 2020).

⁵ All the information reported in parentheses in this paragraph has been obtained from The OECD Gender Data Portal (2020).

Chiappori, 1992). If such models best describe the persistent gender disparities we observe during the lockdown in Spain, then such gaps in home production should be explained by observed differences in worker availability, as one individual in the partnership specializes in paid market work and the other specializes in unpaid home production.

In contrast, a finding that the larger burden of unpaid work borne by women during the lockdown is not explained by their working situation would be inconsistent with these traditional models of within-household specialization. Instead, this would be more in-line with the predictions of more recent theories that incorporate the concept of gender identity (Akerlof and Kranton, 2000) or the presence of social norms (Kleven et al., 2019) to account for the allocation of paid and unpaid work within families.

If such gendered social norms are a driving force behind the gendered division of work, one would expect that among households that experience similar labor market shocks due to the pandemic and lockdown, those households that had previously exhibited a more traditional division of household unpaid labor would be more likely to respond to the sharp increase in domestic demands with further gendered-specialization than those who had previously exhibited a more gender-neutral distribution of household production. We therefore also use this sudden shock of home confinement (and corresponding increase in home production) in Spain to test these predictions and further explore competing theories behind gendered household production.

3. The Spanish lockdown

As mentioned, Spain was hit early and hard by Covid-19, leading to one of the strictest lockdowns in Europe. On March 9, 2020, the government announced that effective March 11, 2020, all classes at all educational levels would be cancelled in the region of Madrid, affecting more than 1.5 million students. By March 12, 2020, this was extended to all of

Spain. On March 14, 2020, it was announced that effective in 24 hours, Spain would enter a “state of alarm”. The state of alarm entailed a nationwide lockdown, banning all trips that were not of absolute necessity. Residents were ordered to stay home except to buy food or medicine, go to work, go to the hospital, or other emergencies.

While work outside the home was still allowed, those who could were asked to work from home, and lockdown restrictions also mandated the temporary closure of non-essential shops and businesses. On March 17, 2020, the Spanish government announced a support package of roughly 20% of GDP, including measures to help workers and companies affected by the lockdown. This package included the streamlining of temporary dismissal files (known as *ERTEs*), similar to furloughs.

By March 28, 2020, just 2 weeks after the state of alarm was announced, the Spanish government had officially banned all non-essential economic activity. After these initial moves, the state of alarm was extended repeatedly, with the confinement conditions essentially unchanged. Overall, from March 15, 2020, through early May, Spain remained under the strictest lockdown in Europe.

Some easing of conditions began at the very end of April and beginning of May. Notably, on April 13, 2020, some workers in select sectors, such as construction and industry, who could not work from home but were not deemed essential sectors, were allowed to return to work. On April 26, 2020, some restrictions on personal activity were lifted, as children were able to go outside for the first time since the beginning of the confinement period. This only refers to going outside to play for limited periods of time as academic activity and school-related activities were not resumed until mid-September 2020.

On April 28, 2020, the government announced a plan to reduce the lockdown restrictions, referred to as “phases”. On May 2, 2020, adults were allowed to go outside

to walk and do sports following a strict time schedule. By May 11, 2020, some regions were moved to phase 1 of the de-escalation of restrictions. At this point, roughly half of the Spanish population experienced an easing of restrictions, allowing social gatherings of up to 10 people, adhering to social distancing, as well as some businesses opening conditional on safety measures put in place. The state of alarm was finally lifted on June 21, 2020, after 97 days of exceptional restrictions.

4. Data collection

During the month of May 2020, we contracted with a survey company (IPSOS IBERIA, S.A.) to run a survey for a representative sample of the Spanish population aged 24-50. The final sample size was 5,001 individuals. The survey was carried out with quotas by region to preserve representativeness at both the national and regional levels. Sampling quotas for age, education, and family composition were also applied to guarantee representativeness of the sample along these dimensions.⁶

Sampling was done online (Computer Assisted Web Interview, or CAWI questionnaire) and was programmed to be “device agnostic” so it could be answered using a computer, a tablet or a smartphone. Considering the unique situation at the time of our data collection, we also checked that the standard sampling one would expect from a survey company was not altered during this time. Ipsos confirmed that their response rate increased during the lockdown period in Spain by roughly 8.8%. However, this appears to be roughly a proportional increase with no notable increases that differ across population groups (for example, by age groups or gender). All respondents were sampled between May 5 and May 19, 2020, and the vast majority were surveyed within the first

⁶ For example, to ensure that our sample represents the national distribution of educational levels, the quotas were set to achieve 24.8% with a “high” education level (university degree), 60.3% with “medium” (professional training degree or *Bachillerato*, a 2-year college prep at the end of high school), and 14.9% with “low” educational attainment (high school degree or less).

few days (e.g. 4,246 of our 5,001 respondent were sampled by May 7, 2020). This means that the easing of the lockdown conditions had just started.

Our questions were asked in reference to two specific time periods. First, we ask questions referring to the time period “before the declaration of the state of alarm on March 14 due to the evolution of the Covid-19 pandemic in Spain” (translated from Spanish). Each following question then reminds the respondent of the relevant time period by starting with “before the declaration of the state of alarm”, then proceeding with the rest of the questions.

Second, we ask about the time “since the declaration of the state of alarm on March 14”. Each question asked of this later time period reminds the respondent of the relevant time frame by starting each question with “during the state of alarm.” Both reference periods are very recent and salient in the minds of our respondents at the time of the survey. Additionally, the abrupt and decisive measures taken across the entire country resulted in a change from “normal” life to strict lockdown conditions in a matter of days. The stark contrast before and during the state of alarm created a clear “treatment” of lockdown, with little doubt among Spanish residents as to what “before” and “during” refer to. While biases in recollection can occur with retrospective data, we view this as unlikely in this context.

Due to our age range restrictions, our sample most closely represents the prime working age population in Spain, which accounts for roughly 40% of the overall Spanish population.⁷ In addition, the age range aligns with key ages when children may be present in the household. Our sample is therefore particularly fit for our two main areas of interest, namely, (1) how the lockdown as a result of the Covid-19 pandemic differentially affected

⁷ For example, using age distribution numbers from INE (Table: “*Población residente por fecha, sexo y edad*” for June 1, 2019), our age range accounts for 37.6 % of the Spanish population. Comparing this to The World Factbook 2020 CIA reports for Spain, those aged 25-54 years (close to our age range) account for 44.5% of the population, while the same INE population estimate for this age range is 42.8%.

the labor market status of men and women, and (2) the impact of the shock on the distribution of domestic tasks as well as childcare within the household by gender.

Table A1 in the Appendix displays the descriptive statistics for the different samples employed in the analysis. Panel A focuses on respondents with valid information on the set of controls employed in the estimation and measures of the extensive margin of the labor supply both before and during the lockdown. We employ two different indicators to capture the situation in the labor market: *working*, which takes value 1 if the individual is working and 0 otherwise (including furloughs, unemployed and inactive); and *employed*, which takes value 1 if the individual has a job (including furloughs) and 0 otherwise (unemployed or inactive). We also define an indicator for *working outside the house* that takes value 1 if the individual never works from home and 0 otherwise. This variable is defined only for the sample of individuals who are working.

The first column in Table A.1. reports the descriptive statistics for all male and female respondents with valid information to conduct the empirical analysis. We refer to this sample as S1, which includes 4,877 individuals, i.e. 9,754 observations (before and during lockdown). This initial sample is 58% female, 28% have a college degree and 73% live with a partner.⁸ In our analysis of the household distribution of domestic and childcare tasks, we restrict our sample to respondents in opposite-sex couples with children younger than 17.⁹ We refer to this sample as S2, which includes 1,774 individuals, or 3,548 observations (i.e. 36% of the initial sample).¹⁰ In some specifications, we also employ as a control group the sample of respondents in opposite-sex couples with children older than 16 or childless. We refer to this sample as S3, which

⁸ We did not include a specific target to get exactly 50% response by gender.

⁹ We follow the existing literature to define the sample of interest (see Andrews et al. (2020), Del Boca et al. (2020), Hupkau and Petrongolo (2020) and Sevilla and Smith (2020)).

¹⁰ While 34% of households in Spain overall have children present (INE, 2018), this percentage is larger in our age range of 24-50 (57%).

includes 943 persons, or 1,886 observations (19% of the initial sample with valid information).¹¹ The descriptive statistics for these two samples are presented in column 2 and 3, respectively, in Table A.1 panel A.

An important part of our study focuses on unpaid work. Accordingly, our survey collects information not only on the number of weekly hours in paid work, but also on the number of weekly hours devoted to domestic chores (including cleaning the house, grocery shopping, doing the laundry, food preparation, home repairs, and the managing of household finances) and childcare (including physical and emotional care and leisure). The different columns in Table A.1. panel B present descriptive statistics for the different samples S1*, S2* and S3*, which, respectively, restrict S1, S2 and S3, to the observations with valid information on hours in paid and unpaid work.

5. Empirical strategy

To estimate the effect of the lockdown and the presence of gender asymmetries across groups we estimate the following model:

$$(1) \quad Y_{it} = \alpha + \beta_1 Female_i + \beta_2 Lockdown_t + \beta_3 Female_i * Lockdown_t + \gamma X_i + \varepsilon_{it},$$

where the dependent variable is the outcome of interest for respondent i (i.e. employment status, hours of paid or unpaid work, share of childcare and household chores). We only ask about employment status during lockdown if the respondent was working before. We thus miss information for respondents who were not working before lockdown but found a job during. These cases may lead to some measurement error in the dependent variable, which we expect to be small.

¹¹ In our sample, 72% of the respondents live with a partner. Among them, 50% live in opposite-sex couples with children younger than 17; 27% live in opposite-sex couples with children older than 16 or childless; and 23% live in same-sex couples or do not report valid information to identify the gender of the partner.

The explanatory variables included in the model are: a gender indicator, and a dummy for the lockdown period (the time during the state of alarm relative to the time right before the state of alarm). To identify the differential effect of the lockdown across genders we include an interaction between the gender and the lockdown indicator. In our preferred specification, we also include a dummy for the respondent holding a university degree, the interaction between the university degree indicator and the lockdown, and the triple interaction between gender, university, and lockdown. The vector X_i includes a set of individual controls: the age of the respondent, an indicator for living with a partner, an indicator for the presence of children, and indicators for the ages of the children (younger than 1, 1 to 5 years old, and 6 to 12 years old). These age groups correspond to the different education levels in Spain: pre-school (under 6) and primary school (6 to 12). We include a dummy to capture the effect of very young children (under 1 y.o.). The excluded category (i.e. 13 to 16) corresponds to compulsory post-secondary education.

We also estimate the model in equation (1) including individual fixed effects (α_i) to control for all time-invariant, individual-level factors:

$$(2) \quad Y_{it} = \alpha_i + \beta_1 \text{Lockdown}_t + \beta_2 \text{Female}_i * \text{Lockdown}_t + \beta_3 \text{University}_i * \text{Lockdown}_t + \beta_4 \text{Female}_i * \text{University}_i * \text{Lockdown}_t + \varepsilon_{it}.$$

The model in equation (1) allows us to identify the magnitude of the gender gap before the lockdown and it is useful to frame our discussion. However, our main set of results is based on the model that includes the individual fixed effects in equation (2).

6. Results

6.1. Changes in paid work during the lockdown

The pandemic lockdown severely affected the employment prospects of the Spanish population. Figure 1 (Panel A) shows labor market outcomes for men and women in our

sample (Sample 1 or S1). Employment rates were higher for men before the lockdown, with only 13% of our male respondents out of work (whether unemployed, on leave, or out of the labor force), compared with almost 29% of women. Around 7% of both men and women became unemployed during the lockdown (slightly less for men than for women), while 17% of men and 18% of women were furloughed.

<<INSERT FIGURE 1>>

Furloughs were more common among lower-educated workers. Panel B of Figure 1 shows that almost 20% of workers with no university degree went on temporary leave during lockdown. Lower educated men and women experienced similar furloughs (18.3% and 19.5%) and job losses (7.3% and 7.4%), which is not the case for their higher educated counterparts. Combined furlough and job losses for university-educated women was 22%, while for university-educated men they accounted for 15%. This gap was driven primarily by job losses for university educated women, which at 8.3% was the largest of all groups. University educated men experienced the lowest incidence of both furloughs and job losses.

To document these changes more precisely, Table 1 presents coefficients from the estimation of linear probability models for equations (1) and (2). Columns 1-2 display results from estimation of equation (1), column 3 displays the estimates of the model in equation (2) excluding individual fixed effects, and columns 4-6 present results from estimation of equation (2). Panel A shows the results when the dependent variable is a binary indicator for the respondent working in the corresponding period (i.e. those on leave or furlough, as well as those not employed, get assigned a 0).

<<INSERT TABLE 1>>

Column 1 corresponds to the estimation of model (1), including only the gender and lockdown indicators and their interaction, on the sample of male and female

respondents with valid information. As seen in Figure 1, the female coefficient shows that women were working at a lower rate than men before the lockdown, by 15 percentage points. The fraction working fell by 23 percentage points among men during lockdown, and the drop was 2.3 points higher for women (shy of significance in column 1). These results are consistent with those of the specification that includes individual controls for age, university degree, the presence of partner and children in different age ranges (column 2).

Column 3 estimates the effect of the lockdown across educational groups. The point estimate on the interaction between the lockdown and the educational dummy indicates that college graduates were about 11 percentage points more likely to be working during lockdown.

Column 4 presents the estimates of the model in equation (2) that includes individual fixed effects. The results are very similar in magnitude and statistical significance to those in Column 3. The only remarkable difference is that with individual fixed effects, the coefficient on the triple interaction between lockdown, gender and university is statistically significant, suggesting an additional negative effect on the probability of working during lockdown among college educated women (5 percentage points lower).

Finally, the two remaining columns in Table 1 show the results of running the same specification as in column 4 separately for the subsample of respondents living in different-sex couples with children younger than 17 (column 5) and for couples with older children or childless (column 6).¹² The estimates in both of these columns indicate that the decline in the working probability is similar to that estimated on the entire sample (i.e., 25 to 27 percentage points). In the sample of couples with young children, the

¹² Descriptive statistics for the different samples are presented in Table A.1, panel A.

educational gap is also large and statistically significant and there is some evidence of an additional penalty for high-skilled women in this group (although not significant). Notably, neither the education gap nor the penalty for high skilled women are found for individuals in couples without young children.

As we saw in Figure 1, most of the employment losses resulting from the lockdown were temporary (furloughs). Panel B of Table 1 documents the changes in employment status, where employment is a binary indicator for workers holding a job, whether currently at work or on temporary leave. We find that the employment rate fell by about 7 percentage points, a bit less for university-educated workers (i.e., about 3 percentage points less). This result highlights the importance of furloughs in mitigating the effect of the pandemic on the labor market. The coefficient on the triple interaction is negative and statistically significant, suggesting that high-skilled women had a larger probability of losing their jobs than their male counterparts (4 percentage points more). Combined with the findings in Panel A (and as shown in Figure 1), this indicates that the employment prospects of non-college workers with children and to some extent that of high-skilled women were the most affected during the lockdown.

Another important implication of the pandemic on the functioning of the labor market has been the promotion of remote working. Since the outbreak of the new virus, workers have been pushed to work from home when possible. Panel C in Table 1 examines the incidence of remote work in our sample by estimating the model in equations (1) and (2) replacing the dependent variable with an indicator that takes value 1 if the individual always works outside the house and 0 otherwise. Estimation is restricted to the sample of individuals who work. According to the estimates in column 1 to 3, before the lockdown, women were more likely to work outside the house (i.e., 6 to 9 percentage points). The estimates of the fixed effect model in column (4) indicate that during the lockdown, the

probability of working outside the house decreased by 17 percentage points among men and 26 percentage points among women. There was an additional reduction of 30 percentage points among college educated men and 22 percentage points among college educated women. As a result, the gap in the probability of working outside disappeared among college educated men and women but remained among non-college workers and across educational groups.

We also examine the effect of the lockdown on the number of weekly hours in paid work. In doing so, Panel A in Table 2 reports the estimates of the model in equation (1) and (2) where the dependent variable is the number of hours in paid work, including 0 for those who do not work. These estimates report a mixture of the effect of the lockdown on both the extensive and intensive margin of the labor supply and provide an estimate of the effect of the lockdown on time availability.

<<INSERT TABLE 2>>

Column 1 in Table 2 displays the estimates of the model in equation (1) including the full set of controls. The remaining columns show the estimates of the fixed effect models on the entire sample (column 2), on the sample of opposite-sex couples with children younger than 17 (column 3) and on that of opposite-sex couples without young children or childless (column 4). All columns in Table 2 restrict the estimation to individuals with valid information on hours in paid and unpaid work (i.e., domestic work and childcare).

For the sample of all respondents (column 1), we find that women worked around 9 hours per week less than men before the lockdown. Hours in paid work fell during lockdown by roughly 14 for men, and slightly less for women (2 hours less). This would suggest some convergence in work hours between genders. The full set of interactions between lockdown, female, and university-educated shows that this slight narrowing of

the gender gap in work hours is driven by lower educated women. Similar results hold when the model is estimated including individual fixed effects (column 2). For the sample of couples with young children (column 3), the narrowing of the gender gap is even larger (5 hours). In contrast, there is no evidence of gender convergence in hours of paid work among couples without young children (column 4).

Finally, the estimates show that university-educated individuals worked more hours before the lockdown and even more so during lockdown, compared to those without a university degree. Overall, our results suggest that gaps in hours worked somewhat narrowed by gender and somewhat widened by education.

6.2. Changes in unpaid work during the lockdown

An important consequence of the pandemic lockdown was the dramatic increase in family needs due to school closures and the impossibility to outsource domestic services. Figure 2 compares the number of hours spent in household chores and childcare by men and women before and during the lockdown. The figure presents this information reported separately for male and female respondents in the S2* sample – individuals in an opposite-sex couple with young children – on their own hours. In other words, when comparing “mothers” and “fathers” using this figure, we are not comparing respondents and their partners, but rather mothers and fathers from different households who answered the survey separately. We are thus implicitly assuming that the distribution of housework is similar in households where men respond to the survey as in households where women respond to the survey within this sample.

<<INSERT FIGURE 2>>

Before the lockdown, mothers in our sample reported spending on average 12 hours a week on chores and 34 on childcare, compared with 8 and 17 for fathers. These

numbers suggest that women were responsible for 77% of the domestic pre-lockdown burden. During lockdown, that number fell to 63%. Although the volume of childcare and chores increased for the two parents, it increased slightly more for men than women.

We study these changes in detail by estimating our models using as a dependent variable the number of hours in domestic chores (panel B in Table 2) and childcare (panel C in Table 2). The estimates in column 1 in both panels confirm the presence of a gender gap in hours devoted to unpaid work before the lockdown. During lockdown, both men and women increased the number of weekly hours in household chores by 2.6 in the whole sample (column 1 and 2), by 3 in the sample of couples with young children (column 3) and by 2 in the sample without young children (column 4).

Time devoted to childcare also increased during lockdown. We identify the largest increase for the sample of couples with young children, where both men and women spent 6 more hours per week on childrearing activities (column 2). In this sample, we also find evidence of an increase of almost 6 hours in the gender gap in hours of childcare among college educated workers.

The results in Table 1 and 2 indicate an economically and statistically significant change in the time use of high-skilled women with children during lockdown. These women reduced their time in paid work either in the form of a lower probability of working (Table 1, Panel A, Column 4) or a reduction in paid work hours (Table 2, Panel A, Column 3). In contrast, college educated women significantly increased their time in childcare (Table 2, Panel C, Column 3). This evidence suggests an increase in the specialization of college educated women in home production.

Finally, the estimates in Panel D report the effects of the lockdown on the total number of hours worked, including both paid and unpaid work. The estimates in the different columns indicate a widening of the gender gap in total hours worked,

particularly large among couples with young children (column 3). In these couples, women worked in total almost 6 more hours per week than men, and the gap seems even larger among college educated workers (8 hours). The results from the previous panels indicate that the increase in the gender gap in total work hours is driven by the smaller reduction in the number of hours in paid work among non-college women and the larger increase in time devoted to unpaid work particularly among college educated women. This gender asymmetry is not identified on couples without young children (column 4).

6.3. The effect of the lockdown on within-household specialization

So far, our results indicate that the pandemic lockdown led to important job losses that were more severe among non-college workers and to some extent among high-skilled women. We also document an important increase in the gender gap in total hours worked driven by a smaller reduction in the number of hours in paid work among women and their larger contribution to unpaid work. As a result, the pandemic may have exacerbated the “double burden” of paid and unpaid work among working women.

In this section we examine the consequences of the lockdown for specialization patterns within households. Traditional neoclassical and bargaining family models (Becker, 1985 and Chiappori, 1992) predict that household members with a lower attachment to the labor market specialize in home production. More recent theories suggest that the presence of gendered social norms perpetuate the role of women as main caregivers independently of their situation in the labor market (Bertrand et al., 2015 and Kleven et al., 2019). The employment shock resulting from the measures adopted to contain the new virus allow us to shed some light on the relevance of the different theories in explaining the within-household specialization patterns.

According to our previous results, 23% of the male and female respondents in our survey were not working during lockdown and a larger percentage were at home, either because they could telecommute or because they lost their jobs. These employment changes allow us to estimate the effect on the domestic workload distribution resulting from variations in time availability plausibly unrelated to workers' productivity.

To this aim, our survey asks respondents how childcare and domestic tasks were shared within the couple before and during the lockdown, ranging from the respondent doing 0 to 100% of each type of activity. We provide the following options: the respondent does none, almost none, some, about half, most, almost all or all of each task. We then convert the responses into shares (0, 15, 25, 50, 75, 85 and 100%). Figure 3 focuses on the sample of opposite-sex couples with young children (sample S2*) and shows the average reported shares of childcare for men and women before and during the lockdown (Panel A). Again, we only consider respondents, so the shares reported for fathers come from male respondents regarding their household share of work, while the shares for mothers comes from female respondents. The shares do not necessarily sum to one for each type of task, as the mothers and fathers reporting do not come from the same households.¹³

<<INSERT FIGURE 3>>

According to our respondents, before the lockdown mothers shouldered about 67% of the childcare, which remained approximately unchanged during the lockdown. A

¹³ The fact that shares do not sum to one could be driven by differences in the types of households for which men are survey respondents versus where women are respondents, or due to different reporting by men and women. We do not expect this kind of reporting bias, even if it was gender-specific, to be problematic for estimation, as it would be accounted for in the fixed-effects regressions, provided respondents do not change their way of misreporting before and during lockdown.

similar pattern is observed if we consider separately the different childcare tasks included in the survey (physical care, emotional care and leisure activities).¹⁴

In terms of the distribution of household chores (Figure 3, Panel B), we observe a similar pattern. Before the lockdown, most tasks were shouldered by women, except repairs and management. During lockdown, this specialization pattern persisted for all tasks except grocery shopping, which men undertook to a greater extent.

Using the same sample (S2*), Figure A1 in the Appendix shows the magnitude of the gender gaps within the household before and during the lockdown for each kind of childcare and domestic chore. This time, gender gaps are computed as women's share minus men's share within partners. Again, we can observe that management and repair tasks are the only items for which the gender gaps favor men, with men doing more than women. Shopping is the only activity for which the sign of the gender gap reverses during lockdown.

Figure A1 combines the responses from male and female respondents. However, there could be differences in the way men and women report their own housework and childcare as compared to their partner. This is both important to consider in relation to our results but is also directly interesting. We observe in our data that regardless of whether the respondent is male or female, women's reported share is higher than men's, but less so when reported by men. We therefore calculate gender gaps that are smaller when the respondent is male. For instance, Figure A1 shows a gender gap of 24% in childcare (overall) before lockdown, but this gap is higher when reported by women (35%) than when reported by men (12%). The same occurs for domestic chores.

¹⁴ These questions in our survey describe each category of care with examples. The examples listed for the category "physical care" are: "bathing, diapering, meal preparation, dressing, setting rules..." The examples listed for the category of "emotional and mental care" are: "helping with homework, teaching, educational games, taking them to after-school activities or doing such activities with them." The examples listed for the category of "leisure" are: "taking care of them or watching them while they play or playing with them."

Nevertheless, this difference between gender gaps reported by men and women remains very stable between the periods before and during lockdown. Hence, this kind of reporting bias should not impact our estimation results, as it is accounted for by the inclusion of fixed effects, along with other time-invariant unobserved factors.

To examine the statistical significance of the changes in the distribution of childcare and household chores, we estimate the model in equation (2) using as a dependent variable the share of the different tasks done by the respondents. Given that the shares are partly ordinal and partly cardinal variables (values 0, 50, and 100 can be considered as purely cardinal since they correspond to “none”, “about half”, “all”, but values 25, 75, and 85 are ordinal transformations of “some”, “most”, and “almost all”), we also estimated ordered probit models to compare with our OLS regressions. In accordance with Clark (2016), we find the choice of estimation technique has no implications for the estimation results. The OLS results are presented in Table 3.

<<INSERT TABLE 3>>

The estimated coefficient on the lockdown indicator is positive and statistically significant in almost all tasks but management and repairs. This result indicates that during the lockdown male respondents increased their participation in the different tasks, ranging from 2 percentage points in leisure activities with children to 6 percentage points in grocery shopping. The estimated coefficient on the interaction with female is negative and larger than the estimated effect for males, indicating that men increased their share of participation in the different tasks while women’s share decreased (even though both males and females increased their number of hours). However, the larger contribution of men to home production during lockdown was not enough to compensate the pre-existing gender imbalances, and the burden of home production remained in women’s hands.

Table A.2. in the Appendix shows the estimates of the model in equation (1) for the different tasks. The estimates allow us to gauge the magnitude of the gender gap in different tasks before the lockdown, as well as the effect of the lockdown. From these estimates, it is clear that the increased participation of men in home production during lockdown does not eliminate the gender imbalances that existed before the lockdown.

Next, we examine whether the previous results on specialization patterns are affected by the time availability of the respondent. Table 4 displays the estimates of the model in equation (2) using as a dependent variable the share of domestic chores (column 1) and the share of childcare (column 2), including as an additional regressor an indicator of the working status (Panel B) and also the number of hours in paid work (Panel C). Table 4 also shows the estimates for hours in domestic chores (column 3) and in childcare (column 4). Note that these estimates are comparable to those in Table 2 and 3, which are reported again in Panel A of Table 4 for ease of comparison.

<<INSERT TABLE 4>>

In all the specifications, either the estimated coefficient on the work status indicator or the number of hours in paid work by the respondent is negative and statistically significant, implying a reduction in home production when the labor market attachment of the respondent increases. However, the gender specialization pattern within household, in particular regarding childcare, persists. This confirms that during lockdown women took over more responsibility for household chores and the care of children than men irrespective of their labor market situation.

To gain some insight on the mechanisms behind the persistent gender patterns in household specialization, we conduct a final exercise that compares the response to the lockdown across traditional and non-traditional households. We define traditional families as those where the burden of home production was disproportionately shouldered

by women before the lockdown, while non-traditional families had a less traditionally gendered distribution (i.e., men participation in home production was equal or larger than that of women).

For these two different samples we study changes in the distribution of the workload during lockdown in response to changes in the working situation of the household members. We restrict the sample to different-sex couples with children where both members were working before the lockdown. Table 5 reports the estimates of the following model for both types of families:

$$(3) \Delta(\text{share female}_1 - \text{share female}_0) = \alpha + \beta_1 \text{Only wife works}_1 + \beta_2 \text{Only Husband works}_1 + \beta_3 \text{Bothwork}_1 + \varepsilon_{it},$$

where share female_t is the share of domestic chores or childcare done by the wife in each period. *OnlyWifeWorks* (*OnlyHusbandWorks*) is an indicator that takes value 1 if only the wife (husband) remains employed during lockdown. *Bothwork* is an indicator that takes value 1 if both household members remain employed during lockdown. This model allows us to test if the gender of the spouse whose working situation changed during lockdown has a differential effect on changes in the allocation of household tasks. In the absence of gender asymmetries, we expect $|\beta_1| = |\beta_2|$.

<<INSERT TABLE 5>>

Estimates in columns 1 and 2 correspond to the sample of traditional couples. The estimate on the *OnlyHusbandWorks* indicator is large in magnitude and highly significant (i.e., the wife takes on about 8.5 percentage points more of domestic chores and 7 more of childcare). In contrast the coefficient on the *OnlyWifeWorks* indicator is small and statistically insignificant. Yet, with the smaller sample size in this estimation (N=479), and larger standard errors, our estimates are not precise enough for us to reject the null hypothesis that changes in the working situation of the household members have a

symmetric effect on changes in the distribution of tasks.¹⁵ Another result is that the burden on women increases when both members work (i.e., by 5 percentage points).

The picture looks different in non-traditional couples, where changes in the distribution of the workload are of similar magnitude irrespective of the gender of the respondent who remains working. In these families, the household member who does not work, irrespective of gender, takes on about a 5 percentage points more of domestic chores and 7 percentage points more of childcare (see columns 3 and 4). Note also that the increase in women's burden when both members remain employed during lockdown increases by a seemingly smaller percentage (i.e. about 3 percentage points).

Although not definitive, these results suggest that traditional theories based on time availability cannot explain the unequal distribution of the domestic workload observed during lockdown. In contrast, they align better with the predictions of more recent explanations that acknowledge the presence of social norms whereby women specialize in caring activities regardless of their relative productivity (Bertrand et al., 2015 and Kleven et al., 2019).

7. Conclusions

The measures adopted to contain the spread of Covid-19 led to important changes in the labor market and family life of the Spanish population. During lockdown, a large percentage of both men and women stopped working. Job losses affected more severely non-college workers, through the higher incidence of furloughs. In contrast, job losses among college workers were moderated by their higher ability to work from home. The closure of educational centers and the impossibility to outsource domestic work led to an

¹⁵ We do get a rejection of the null when restricting the sample to women: women report a 11 pp decrease in their share of chores when only they are working, and no change when their partner is the only one working. On the contrary, when restricting the sample to men, men report a 10 pp decrease in women's share when women are the only ones working and a 3 pp increase when men are working and women are not, but neither coefficient is statistically significant.

important increase in family needs that were absorbed to a larger extent by women. The number of hours in paid work also decreased more for men than for women during lockdown. These gender asymmetries of the effect of the pandemic in paid and unpaid work may have exacerbated the phenomenon of the “double shift”, resulting in longer hours worked for women.

We also find suggestive evidence that the lockdown had only a small effect on specialization patterns within households. Despite the increased participation of men in domestic tasks, women still appear to shoulder most of the burden, irrespective of their situation in the labor market. Changes in the distribution of the workload look even smaller in traditional families, where women were doing most household work before the lockdown. Only in non-traditional families (those with an egalitarian pre-lockdown distribution of home production) was the employment situation of both members relevant in determining the distribution of domestic tasks during lockdown. The persistence of these gendered patterns in household specialization are consistent with the predictions of recent models that highlight the importance of social norms in explaining the remaining gender gaps in the labor market.

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Table 1: The effect of the pandemic lockdown on the labor market.

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Working						
Female	-0.150*** (0.011)	-0.144*** (0.011)	-0.164*** (0.014)			
Lockdown	-0.231*** (0.013)	-0.231*** (0.013)	-0.257*** (0.015)	-0.257*** (0.011)	-0.269*** (0.018)	-0.252*** (0.026)
Lockdown X Female	-0.023 (0.018)	-0.023 (0.018)	-0.011 (0.021)	-0.011 (0.015)	-0.005 (0.025)	-0.023 (0.034)
University degree		0.126*** (0.010)	0.040*** (0.015)			
Female X University			0.083*** (0.023)			
Lockdown X University			0.107*** (0.027)	0.107*** (0.019)	0.137*** (0.029)	0.005 (0.057)
Lockdown X Female X University			-0.058 (0.038)	-0.058** (0.026)	-0.043 (0.041)	0.005 (0.069)
R-squared	0.095	0.131	0.133	0.250	0.251	0.264
Panel B: Employed						
Female	-0.137*** (0.011)	-0.129*** (0.011)	-0.150*** (0.013)			
Lockdown	-0.066*** (0.011)	-0.066*** (0.011)	-0.075*** (0.013)	-0.075*** (0.007)	-0.072*** (0.011)	-0.081*** (0.017)
Lockdown X Female	-0.010 (0.017)	-0.010 (0.016)	0.002 (0.020)	0.002 (0.009)	0.001 (0.014)	0.007 (0.021)
University degree		0.087*** (0.009)	0.035** (0.015)			
Female X University			0.078*** (0.022)			
Lockdown X University			0.035 (0.023)	0.035*** (0.011)	0.032* (0.017)	0.027 (0.031)
Lockdown X Female X University			-0.044 (0.034)	-0.044*** (0.016)	-0.014 (0.024)	-0.055 (0.041)
R-squared	0.034	0.073	0.074	0.074	0.066	0.083
Observations	9,754	9,754	9,754	9,754	3,548	1,886
Number of id				4,877	1,774	943
Controls	NO	YES	YES	NO	NO	NO
Individual FE	NO	NO	NO	YES	YES	YES
Sample	S1	S1	S1	S1	S2	S3

Table 1 (cont'd): The effect of the pandemic lockdown on the labor market.

	(1)	(2)	(3)	(4)	(5)	(6)
Panel C: Working outside conditional on working						
Female	0.070*** (0.015)	0.088*** (0.015)	0.064*** (0.017)			
Lockdown	-0.303*** (0.018)	-0.294*** (0.018)	-0.216*** (0.022)	-0.174*** (0.017)	-0.190*** (0.026)	-0.158*** (0.041)
Lockdown X Female	-0.104*** (0.025)	-0.101*** (0.024)	-0.097*** (0.031)	-0.088*** (0.027)	-0.097** (0.042)	-0.115* (0.059)
University degree		-0.196*** (0.013)	-0.128*** (0.026)			
Female X University			0.057* (0.034)			
Lockdown X University			-0.265*** (0.036)	-0.296*** (0.033)	-0.316*** (0.046)	-0.390*** (0.087)
Lockdown X Female X University			0.039 (0.049)	0.083* (0.046)	0.128* (0.071)	0.157 (0.110)
R-squared	0.129	0.170	0.185	0.302	0.328	0.336
Observations	6,421	6,421	6,421	6,421	2,499	1,243
Number of id				3,806	1,462	746
Controls	NO	YES	YES	NO	NO	NO
Individual FE	NO	NO	NO	YES	YES	YES
Sample	S1	S1	S1	S1	S2	S3

Note: All estimation in this table are linear probability models. Columns 1-2 display results from estimation of equation (1), column 3 displays the estimates of the model in equation (2) but excluding individual fixed effects and columns 4-6 present results from estimation of equation (2). The dependent variable in Panel A takes value 1 if the respondent is working and 0 otherwise (including furloughs, temporary leaves, unemployment or out of the labor market). The dependent variable in panel B takes value 1 if the respondent is employed (including furloughs and temporary leaves) and 0 otherwise (unemployed or out of the labor market). Individual controls are described in Section 5. S1 includes all respondents, S2 respondents living in opposite-sex couples with children younger than 17, and S3 respondents living in opposite-sex couples without children younger than 17 or childless. The estimation is restricted to observations with valid information on controls and outcomes before and during lockdown. (***) $p < 0.01$, (**) $p < 0.05$, (*) $p < 0.1$.

Table 2: The effect of the pandemic lockdown on hours of paid and unpaid work

	(1)	(2)	(3)	(4)
Panel A: Hours in paid work				
Female	-8.670*** (0.714)			
Lockdown	-13.901*** (0.764)	-13.901*** (0.609)	-16.562*** (1.049)	-12.781*** (1.431)
Lockdown X Female	2.186** (1.031)	2.186*** (0.781)	5.226*** (1.349)	-0.857 (1.768)
University degree	2.306*** (0.814)			
Female X University	2.995*** (1.156)			
Lockdown X University	5.192*** (1.346)	5.192*** (1.029)	7.600*** (1.600)	5.094* (2.599)
Lockdown X Female X University	-3.071* (1.802)	-3.071** (1.336)	-4.436** (2.205)	-2.965 (3.216)
R-squared	0.178	0.297	0.326	0.309
Panel B: Hours in domestic chores				
Female	2.816*** (0.337)			
Lockdown	2.596*** (0.372)	2.596*** (0.200)	2.962*** (0.333)	1.984*** (0.441)
Lockdown X Female	0.214 (0.531)	0.214 (0.276)	-0.543 (0.470)	0.658 (0.571)
University degree	-0.800** (0.370)			
Female X University	-0.742 (0.526)			
Lockdown X University	0.022 (0.632)	0.022 (0.346)	0.451 (0.619)	-0.406 (0.675)
Lockdown X Female X University	0.004 (0.857)	0.004 (0.446)	0.852 (0.851)	-0.089 (0.853)
R-squared	0.082	0.159	0.168	0.140
Observations	6,722	6,722	2,304	1,396
Number of id		3,361	1,152	698
Controls	YES	NO	NO	NO
Individual FE	NO	YES	YES	YES
Sample	S1*	S1*	S2*	S3*

Table 2 (cont'd): The effect of the pandemic lockdown on hours of paid and unpaid work

	(1)	(4)	(5)	(6)
Panel C: Hours in childcare				
Female	8.548*** (0.704)			
Lockdown	3.122*** (0.649)	3.122*** (0.324)	6.255*** (0.713)	-0.089 (0.125)
Lockdown X Female	1.091 (1.087)	1.091** (0.531)	1.384 (1.190)	0.927** (0.362)
University degree	-1.193 (0.780)			
Female X University	-0.172 (1.151)			
Lockdown X University	0.761 (1.237)	0.761 (0.633)	-0.287 (1.207)	0.104 (0.126)
Lockdown X Female X University	0.453 (1.832)	0.453 (0.942)	5.616*** (2.093)	-0.943*** (0.362)
R-squared	0.412	0.091	0.188	0.020
Panel D: Hours in paid and unpaid work				
Female	2.693** (1.055)			
Lockdown	-8.183*** (1.062)	-8.183*** (0.654)	-7.345*** (1.175)	-10.885*** (1.444)
Lockdown X Female	3.492** (1.584)	3.492*** (0.911)	6.066*** (1.677)	0.728 (1.837)
University degree	0.313 (1.198)			
Female X University	2.082 (1.687)			
Lockdown X University	5.975*** (1.938)	5.975*** (1.202)	7.764*** (1.964)	4.792* (2.572)
Lockdown X Female X University	-2.615 (2.674)	-2.615 (1.625)	2.032 (2.948)	-3.997 (3.218)
R-squared	0.332	0.058	0.050	0.208
Observations	6,722	6,722	2,304	1,396
Number of id		3,361	1,152	698
Controls	YES	NO	NO	NO
Individual FE	NO	YES	YES	YES
Sample	S1*	S1*	S2*	S3*

Note: The estimates in column 1 corresponds to the model in equation (1) and those in columns 2 to 4 to the model in equation (2). The dependent variable in panel A is the total number of hours in paid work (including 0 for not working, see Table A.2 in the Appendix for the estimation restricted to the sample with a positive number of hours). The dependent variable in panel B is the number of hours doing household chores (including cleaning the house, grocery shopping, doing the laundry, food preparation, home repairs and the managing of household finance). The dependent variable in panel C is the total number of hours in childcare (including physical and emotional care and leisure). The dependent variable in panel D is the sum of hours in paid work, doing household and childcare. Individual controls are described in Section 5. S1* includes all respondents with valid information on hours in paid work, household chores and childcare. S2* includes respondents living in opposite-sex couples with children younger than 17 and valid information on hours in paid work, household chores and childcare. S3* include respondents living in opposite-sex couples without children younger than 17 or childless and valid information on hours in paid work, household chores and childcare. The estimation is restricted to observations with valid information on controls and outcomes before and during lockdown. (***) $p < 0.01$, (**) $p < 0.05$, (*) $p < 0.1$.

Table 3: The effect of the pandemic lockdown on household specialization. Different-sex couples with young children.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Cleaning	Shopping	Domestic Laundry	Chores Cooking	Repairs	Management	All	Physical	Childcare Emotional	Leisure	All
Lockdown	3.333*** (0.819)	6.254*** (1.169)	3.123*** (0.732)	2.543*** (0.844)	-0.164 (0.666)	0.529 (0.838)	2.491*** (0.721)	6.086*** (0.786)	4.530*** (0.856)	2.051** (0.811)	4.472*** (0.809)
Lockdown X Female	-6.130*** (1.086)	20.725*** (1.624)	-5.800*** (0.953)	-5.546*** (1.131)	0.519 (1.007)	-0.972 (1.090)	5.988*** (0.930)	-7.187*** (1.035)	-6.723*** (1.092)	-3.784*** (1.074)	-7.993*** (1.013)
Lockdown X University	-0.316 (1.480)	1.835 (1.937)	-0.281 (1.506)	-0.275 (1.595)	-1.674 (1.245)	0.622 (1.347)	-1.302 (1.330)	-1.646 (1.407)	-1.442 (1.469)	-0.795 (1.513)	-2.129* (1.266)
Lockdown X Female X University	-0.334 (1.958)	-1.711 (2.995)	2.640 (1.853)	2.512 (2.142)	2.923* (1.758)	-2.002 (1.809)	2.224 (1.720)	0.551 (1.922)	0.918 (1.979)	3.205 (2.121)	4.301** (1.682)
R-squared	0.026	0.139	0.024	0.016	0.003	0.003	0.030	0.047	0.030	0.008	0.042
Observations	3,538	3,534	3,535	3,533	3,503	3,527	3,519	3,490	3,510	3,495	3,517
Number of id	1,770	1,770	1,770	1,769	1,761	1,770	1,763	1,751	1,761	1,757	1,762
Sample	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2

Note: The estimates in the different columns correspond to the model in equation (1) that includes individual fixed effects. The dependent variable is the share of each task done by the respondent. The possible values are: 100% if the respondent does all the task, 85% if almost all, 75% if most, 50% if about half, 25% if some, 15% if almost none and 0 if none. The model is estimated on the sample S2 that includes all respondents living in opposite-sex couples with children younger than 17. The estimation is restricted to observations with valid information on controls and outcomes before and during lockdown. (***) $p < 0.01$, (**) $p < 0.05$, (*) $p < 0.1$.

Table 4: Household specialization conditional on time availability.

Different-sex couples with young children.

	Share of domestic chores	Share of childcare	Hours in domestic chores	Hours in childcare
Lockdown	2.491*** (0.721)	4.472*** (0.809)	2.962*** (0.333)	6.255*** (0.713)
Lockdown X Female	-5.988*** (0.930)	-7.993*** (1.013)	-0.543 (0.470)	1.384 (1.190)
Lockdown X University	-1.302 (1.330)	-2.129* (1.266)	0.451 (0.619)	-0.287 (1.207)
Lockdown X Female X University	2.224 (1.720)	4.301** (1.682)	0.852 (0.851)	5.616*** (2.093)
R-squared	0.030	0.042	0.168	0.188
Lockdown	1.468** (0.734)	3.565*** (0.842)	2.269*** (0.360)	4.084*** (0.712)
Lockdown X Female	-6.009*** (0.924)	-8.019*** (1.008)	-0.493 (0.465)	1.542 (1.162)
Lockdown X University	-0.784 (1.316)	-1.677 (1.266)	0.839 (0.625)	0.926 (1.196)
Lockdown X Female X University	2.065 (1.709)	4.170** (1.675)	0.678 (0.850)	5.069** (2.055)
Work	-3.829*** (0.913)	-3.407*** (0.979)	-2.340*** (0.526)	-7.336*** (1.321)
R-squared	0.039	0.049	0.187	0.216
Lockdown	1.054 (0.760)	2.864*** (0.920)	2.090*** (0.391)	3.166*** (0.743)
Lockdown X Female	-5.837*** (0.947)	-7.730*** (1.065)	-0.384 (0.472)	2.096* (1.154)
Lockdown X University	-1.119 (1.320)	-1.732 (1.300)	0.899 (0.630)	1.238 (1.201)
Lockdown X Female X University	2.461 (1.726)	4.497*** (1.718)	0.627 (0.854)	4.806** (2.055)
Work	-1.701 (1.483)	-0.219 (1.526)	-1.620** (0.763)	-3.648** (1.721)
Hours in paid work	-0.074** (0.037)	-0.105*** (0.038)	-0.024 (0.018)	-0.121*** (0.038)
R-squared	0.044	0.053	0.188	0.223
Observations	3,417	3,415	2,304	2,304
Number of id	1,746	1,744	1,152	1,152
Sample	S2	S2	S2*	S2*

Note: Note: The estimates in the different columns correspond to the model in equation (2) that includes individual fixed effects. S2 includes all respondents living in opposite-sex couples with children younger than 17, and S2* restricts the sample S2 to respondents with valid information on the number of hours in paid work, household chores and childcare. The estimation is restricted to observations with valid information on controls and outcomes before and during lockdown. (***) $p < 0.01$, (**) $p < 0.05$, (*) $p < 0.1$.

Table 5: Changes in household specialization during the lockdown.

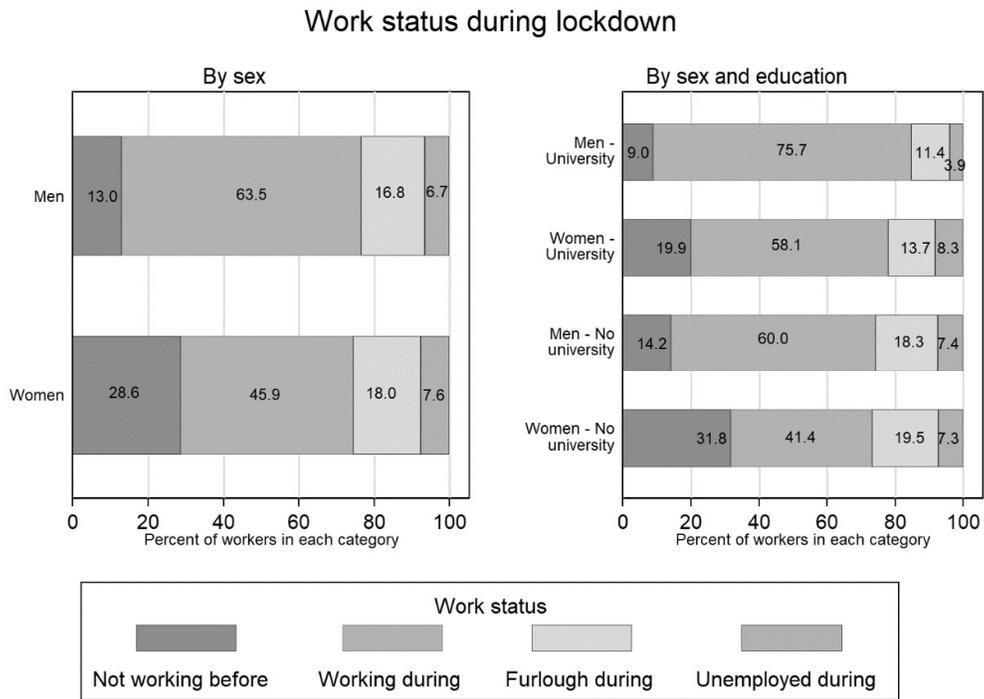
Different-sex couples with young children. Traditional versus non-traditional families.

	(1) Share of domestic chores	(2) Share of childcare	(3) Share of domestic chores	(4) Share of childcare
Only wife works	-2.707 (3.229)	-4.849 (3.809)	-4.921* (2.643)	-6.379*** (1.725)
Only husband works	8.516*** (2.474)	6.755*** (2.441)	6.997*** (2.430)	7.083*** (1.793)
Both work	4.877** (2.286)	3.101 (2.479)	3.531* (1.923)	2.331* (1.226)
Sample of couples:	Traditional	Traditional	Non-traditional	Non-traditional
Observations	479	477	735	740
R-squared	0.059	0.041	0.050	0.069

Note: The estimates on the different columns correspond to the coefficients in model (2). The sample is restricted to different-sex couples with children younger than 17 where both members worked before the lockdown. Traditional couples are those where the burden of home production was disproportionality shouldered by women before the lockdown, while non-traditional families had a less gendered distribution (i.e., men participation in home production was equal to or larger than that of women). (***) $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

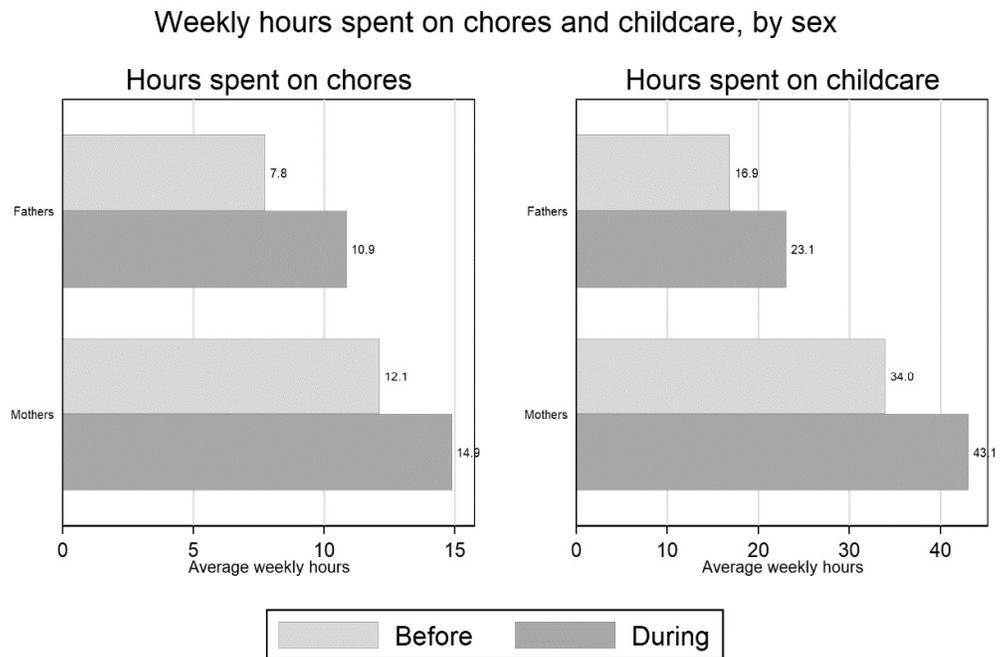
Figure 1. Employment status during lockdown, by sex and education

Panel A. By sex, Panel B. By sex and education



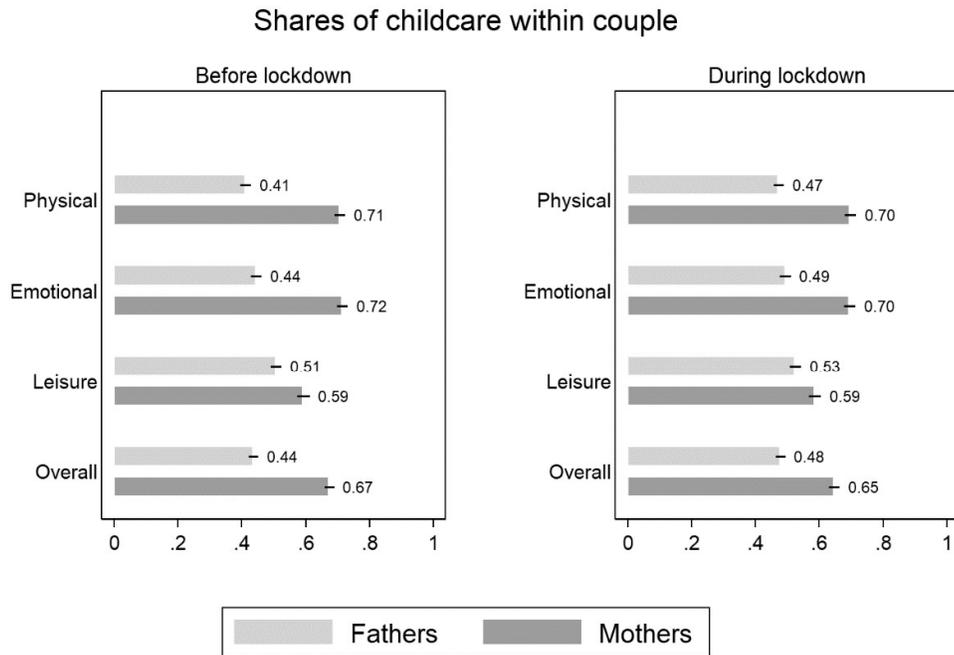
All respondents in S1. N=4,877 individuals.

Figure 2. Hours of childcare and housework



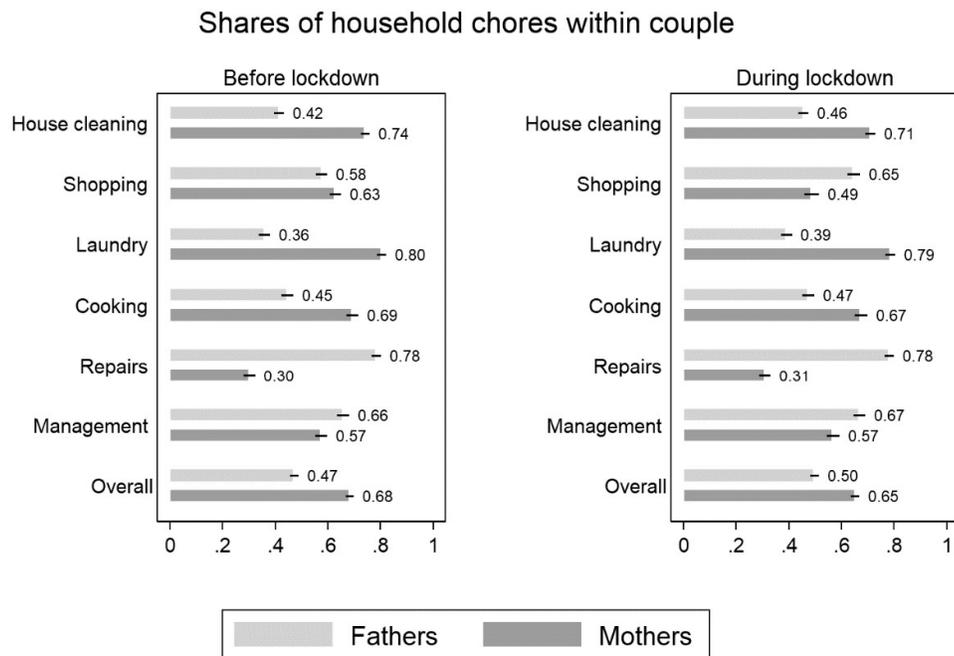
All individuals in S2*: mothers and fathers of children aged less than 17, with available information on paid and unpaid work.
N=1,152.

Figure 3. Within-household distribution of childcare and housework tasks
 Panel a. Childcare



All individuals in S2*: mothers and fathers of children aged less than 17, with available information on paid and unpaid work.
 N=1,152.

Panel b. Housework



All individuals in S2*: mothers and fathers of children aged less than 17, with available information on paid and unpaid work.
 N=1,152.

Appendix

Table A1. Descriptive statistics

Panel A

Sample	All respondents S1	Opposite sex couples with young children (≤ 16) S2	Opposite sex couples with older children (> 16) or childless S3
Controls			
Age	37.34	38.67	36.64
Female	58.17%	54.23%	63.62%
College degree	27.95%	27.96%	27.36%
Living with partner	72.59%	100%	100%
Children ≤ 16 y.o.	52.14%	100%	0%
Children less than 1 y.o.	3.47%	8.17%	0%
Children 1 to 5 y.o.	22.02%	44.87%	0%
Children 6 to 12 y.o.	28.93%	53.55%	0%
Children older than 12	22.76%	32.02%	16.97%
Working			
Before lockdown	78.04%	82.41%	79.11%
During lockdown	53.62%	58.46%	52.70%
Employed			
Before lockdown	79.50%	84.05%	80.81%
During lockdown	72.32%	77.62%	72.75%
Working outside the house conditional on working			
Before lockdown	73.48%	74.15%	78.75%
During lockdown	37.76%	37.49%	41.23%
Number of observations	4,877	1,774	943

Panel B

Sample	All respondents S1*	Opposite sex couples with young children (<=16) S2*	Opposite sex couples with older children (>16) or childless S3*
Controls			
Age	36.88	38.39	35.82
Female	57.30%	52.34%	63.32%
College degree	31.42%	31.60%	31.66%
Living with partner	70.84%	100%	100%
Children <=16 y.o.	48.47%	100%	0%
Children less than 1 y.o.	2.86%	6.94%	0%
Children 1 to 5 y.o.	21.24%	46.27%	0%
Children 6 to 12 y.o.	26.90%	53.99%	0%
Children older than 12	19.75%	31.17%	11.89%
Working			
Before lockdown	79.14%	84.81%	79.94%
During lockdown	53.64%	60.42%	51.58%
Employed			
Before lockdown	80.45%	86.02%	81.66%
During lockdown	72.66%	79.08%	73.21%
Working outside the house conditional on working			
Before lockdown	71.14%	70.28%	75.41%
During lockdown	34.84%	33.33%	35.90%
Hours in paid work			
Before lockdown	28.12	30.67	28.38
During lockdown	16.51	18.55	16.01
Hours in household chores			
Before lockdown	8.75	10.04	8.57
During lockdown	11.47	12.99	10.82
Hours in childcare			
Before lockdown	12.62	25.81	1.70
During lockdown	16.69	33.58	2.02
Number of observations	3,361	1,152	698

Note: Sample S1 includes all respondents with no missing information on controls and all outcomes of interest in Table 1 for the period before and during the lockdown. Sample S2 restricts S1 to respondents living in opposite-sex couples with children younger than 17, and S3 to respondents in opposite-sex couples with children older than 16. Sample S1*, S2* and S3* restricts S1, S2 and S3, respectively, to respondents with valid information about hours in paid work, childcare and household chores.

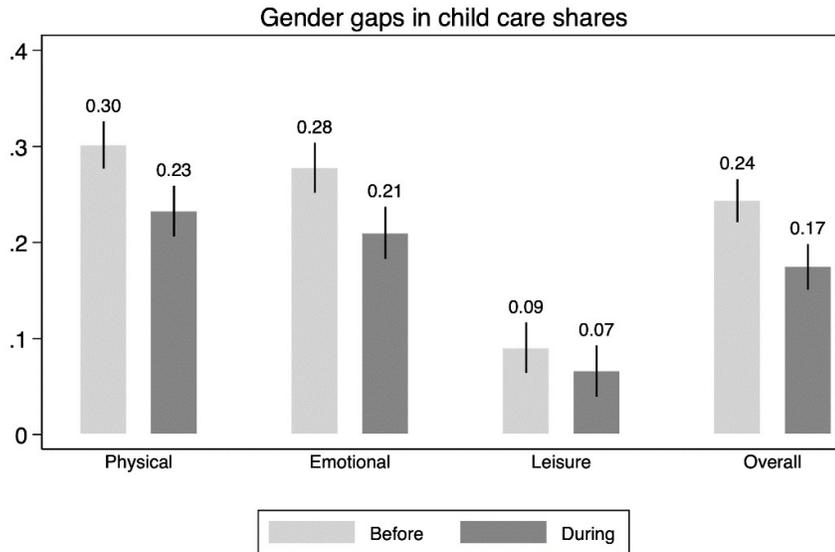
Table A.2: The effect of the pandemic lockdown on household specialization. Different-sex couples with young children.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	House cleaning	Shopping	Domestic Laundry	Chores Cooking	Repairs	Management	All	Physical	Childcare Emotional	Leisure	All
Female	35.069*** (1.211)	7.438*** (1.538)	46.570*** (1.339)	29.028*** (1.577)	-45.603*** (1.428)	-3.743** (1.617)	24.977*** (1.097)	30.309*** (1.142)	27.350*** (1.223)	11.843*** (1.226)	25.886*** (1.043)
Lockdown	3.333** (1.300)	6.145*** (1.639)	3.100** (1.473)	2.354 (1.656)	-0.402 (1.306)	0.390 (1.643)	2.619** (1.165)	5.973*** (1.173)	4.620*** (1.219)	1.890 (1.202)	4.476*** (1.072)
Lockdown X Female	-6.093*** (1.775)	-20.516*** (2.397)	-5.777*** (1.936)	-5.324** (2.272)	0.772 (2.045)	-0.907 (2.323)	-6.083*** (1.597)	-7.118*** (1.657)	-6.887*** (1.740)	-3.537** (1.759)	-7.994*** (1.535)
University degree	2.028 (1.747)	1.632 (1.966)	3.576* (1.931)	3.259 (2.240)	-0.850 (1.686)	4.937** (2.025)	3.656** (1.561)	1.361 (1.562)	1.502 (1.562)	1.255 (1.577)	2.088 (1.431)
Lockdown X University	-0.316 (2.427)	1.850 (2.919)	-0.258 (2.751)	-0.085 (3.139)	-1.656 (2.416)	0.531 (2.838)	-1.429 (2.172)	-1.340 (2.155)	-1.531 (2.160)	-0.647 (2.220)	-2.052 (1.989)
Female X University	-7.411*** (2.356)	-6.475** (2.754)	-9.346*** (2.545)	-14.686*** (3.126)	-5.492** (2.547)	-11.029*** (2.866)	-9.985*** (2.097)	-5.604*** (2.107)	-5.994*** (2.191)	-8.338*** (2.305)	-7.811*** (1.949)
Lockdown X Female X University	-0.424 (3.358)	-1.826 (4.321)	2.807 (3.653)	2.290 (4.436)	3.182 (3.669)	-2.119 (4.076)	2.319 (2.992)	0.147 (3.023)	1.021 (3.082)	2.671 (3.258)	4.141 (2.761)
R-squared	0.315	0.047	0.428	0.144	0.453	0.029	0.204	0.283	0.226	0.044	0.232
Observations	3,538	3,534	3,535	3,533	3,503	3,527	3,519	3,490	3,510	3,495	3,517
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Sample	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2

Note: The estimates in the different columns correspond to the model in equation (1). The dependent variable is the share of each task done by the respondent. The possible values are: 100% if the respondent does all the task, 85% if almost all, 75% if most, 50% if about half, 25% if some, 15% if almost none and 0 if none. Individual controls are defined in Section 5. The model is estimated on the sample S2 that includes all respondents living in opposite-sex couples with children younger than 17. The estimation is restricted to observations with valid information on controls and outcomes before and during lockdown. (***) $p < 0.01$, (**) $p < 0.05$, (*) $p < 0.1$.

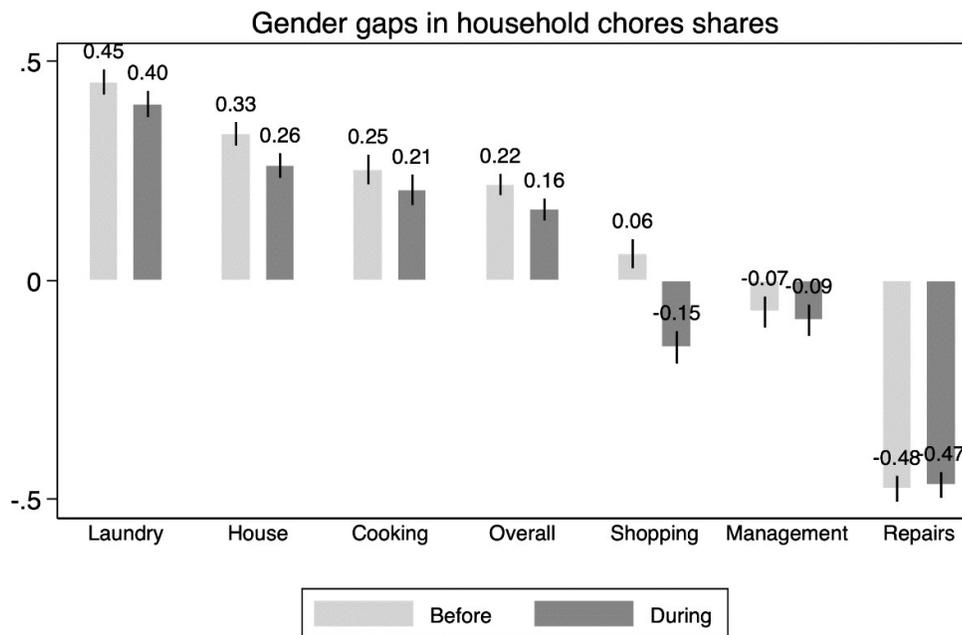
Figure A1. Gender gap in childcare and housework shares

Panel A. Childcare



All individuals in S2*: mothers and fathers of children aged less than 17, with available information on paid and unpaid work.
Gaps are computed as Mother's share-Father's share.
N=1,152.

Panel B. Housework



All individuals in S2*: mothers and fathers of children aged less than 17, with available information on paid and unpaid work.
Gaps are computed as Mother's share-Father's share.
N=1,152.