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DISCUSSION PAPER SERIES

IZA DP No. 14460

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Daniela Del Boca
Collegio Carlo Alberto and IZA

Paola Profeta
Bocconi University and CEPR

Noemi Oggero
University of Turin and CeRP-CCA

Maria Cristina Rossi
University of Turin and CeRP-CCA

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IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Did COVID-19 Affect the Division of Labor within the Household? Evidence from Two Waves of the Pandemic in Italy*

The COVID-19 pandemic has increased housework, childcare and home-schooling worldwide. An additional substantial burden has fallen on women, especially in countries where the division of family work within the couple was traditionally unbalanced. Yet the pandemic and subsequent home-working may also represent the opportunity for increasing fathers' involvement in the family, thus rebalancing traditional family arrangements. This effect depends on working arrangements of each partner, i.e., working from home, continue working at the usual workplace or stop working. To understand the impact of COVID-19 on the division of labor within the household in a traditional context and the role of working arrangements, we conduct a survey on a representative sample of Italian working women who are interviewed during the two waves of COVID-19 (April 2020 and November 2020). Our data show that the gender gap in household care related activities increased during the first wave of COVID-19 pandemic, it decreased during the second wave but remained higher than before COVID-19. The time spent on housework, childcare, and supporting distance learning of children by women do not depend on their partners' working arrangements. Conversely, men devote less hours to housework and distance learning when their partners are at home. Interestingly, home-working and/or non-working men spend more hours on family work. However, the increased time spent at home does not seem to lead to a reallocation of couples' roles in housework and children care. Working arrangements are also related to women's feelings of uncertainty, with heterogeneous effects by level of education of women.

JEL Classification: J13, J16, J21

Keywords: COVID-19, work arrangements, housework, childcare, distance learning

Corresponding author:
Daniela Del Boca
Department of Economics and Statistics
University of Turin
Via Lungodora 100 T
Torino 10153
Italy

E-mail: daniela.delboca@carloalberto.org

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1. Introduction

The COVID-19 crisis has affected the lives of millions of people around the world damaging economic, health and educational outcomes. The pandemic and the consequent lockdown have imposed a change in work arrangements, with a substantial spread of working from home. The closure of schools has increased the amount of time that families have to spend in housework, childcare and in supporting distance learning of children. How has this increased work been shared between men and women in the family? Did the pandemic affect the pre-COVID division of labor within the household? What is the role of working from home in the new allocation of labor within the household? Do working arrangements also impose consequences on women's conditions?

On one side, if women continue to take care of most of the family responsibilities – before COVID-19, on average, in OECD countries, women spent two hours per day more than men in unpaid work at home - the extra work becomes an additional burden for women. Thus, the asymmetry between men and women enlarges, with potential increases of the gender gaps in the economy. On the other side, the pandemic, which imposes new work arrangements and a massive use of home working by all workers (men and women) may represent the opportunity for increasing men's involvement in the family, thus rebalancing traditional family arrangements. As a consequence, the division of labor within the family may become more balanced and gender gaps are expected to decrease.

A new equilibrium will emerge, depending on which of the two sides prevail. We expect the first side to characterize the short-run impact of COVID-19, especially in countries with conservative gender culture and a substantial asymmetry between men and women in the household. The second side instead needs more time to materialize, and it is strongly linked to work arrangements of men and women within the couple. More precisely, if men work from home, the involvement of men in housework and childcare will likely increase. If, instead, home working is not equally used by men and women but prevails among women, this change is more unlikely to happen.

Our research shows how COVID-19 has changed the division of labor within the household in Italy, a context characterized by large pre-COVID asymmetries. Italy was the first European country to report people infected by the new coronavirus and one of the countries with the highest number of cases and death rates. Italy experienced two main times of restrictions due to the pandemic: the first one in March 2020 and the second one in October 2020. Thus, it represents the ideal context to understand whether COVID-19 has changed the division of labor within the household at the outbreak of the pandemic and in its evolution over time.

We use a unique source of survey datasets to run our research, a sample representative of Italian working women. The survey was conducted in two waves: the first one in April 2020, at the outbreak of the pandemic, and the second one in November 2020, when a second wave of the pandemic hit the country. Women are asked about their own working arrangements as well as those of their partners. In particular, they were asked whether at the time of the survey they were working from home rather than at the usual place or whether they were not working at all. Moreover they were asked their time allocation with their partner with respect to housework, childcare and support to children's distance learning.

Given the timing of the two surveys, we are able to detect if and how the working arrangements and the household division of labour have been shaped by the pandemic in the short run and in the longer run. In this way we are able to compare if the working arrangements of women and their partners were shaped by the pandemic in a different way in the first and the second wave. Then we investigate whether the working arrangements due to COVID-19 differently affected the hours spent on housework and childcare by the two partners. More precisely, we study whether the hours spent in family work are related to the time that women and their partners have to spend at home due to the emergency restrictions. We find that the gender gap in household care related activities had increased during the first wave of COVID-19 pandemic. Although differences have decreased during the second wave, the distribution of time spent on housework and childcare within the couple remains highly unbalanced against women, even after accounting for different working arrangements. Indeed, we find that the time spent on housework, childcare, and support to distance learning by women do not depend on their partners' working arrangements. Conversely, men devote less hours to housework and home schooling when their partners are at home. Even if working-from-home and/or non-working men spend more hours on family work during the second wave of COVID-19, the increased time spent at home does not seem to lead to a full reallocation of couples' roles in housework and children care.

Working arrangements may also directly affect women's living conditions and their perception of it. In times of uncertain economic conditions due to the pandemic, economic insecurity represents a crucial aspect. We thus explore the emergence of women's feelings of economic insecurity and dissatisfaction. We consider several dimensions: job insecurity, earnings loss, and their expected levels of future pensions. Our results show that women who are not working several months after the outbreak of COVID-19 and those with a non-working partner are more concerned of losing their job or closing their activities. We also find that education is important in reducing women's feeling of insecurity.

As sharing housework and childcare affects women's participation to the labour market (Matysiak and Mynarska, 2020; Fanelli and Profeta, 2021), assessing whether and how the pandemic has changed the division of labor within the household is fundamental to understand the evolution of gender gaps. In fact, differently from past economic crises which had a greater negative effect on men's employment than on women's one, COVID-19 has hit women equally or even harder than men, as many of the lost jobs have been in service sectors with large female workforces, such as retail, restaurants and hospitality (ILO, 2020; Hupkau and Petrongolo, 2020; Alon et al., 2020).[1] The unbalanced division of labor within the household risks to amplify the negative consequences of COVID-19 on gender gaps. Many working mothers are struggling to make it work, because of the need for at least one parent to stay home and mind the children (Queisser et al., 2020). A growing research has thus concentrated on the impact of COVID-19 on the division of labor within the household in specific countries. Evidence from Spain (Farré and Gonzalez, 2020), the UK (Sevilla and Smith, 2020), and Italy (Del Boca et al., 2020; Mangiavacchi et al., 2020) show that there has been an initial shift towards a more equal distribution of household and childcare between men and women in the first months of the pandemic, even if most of the extra work caused by the crisis has fallen on women. A comparative analysis of a novel data set including Italy, the UK, and the US confirms these results (Biroli et al., 2020). D'Ambrosio et al. (2020) collected and analysed a new data set of 1,700 cohabiting partners during 2020[2] comparing the impact of COVID-19 and the severity of measures adopted, on time allocation and well-being of couples in several European countries including Italy, Spain, France, Belgium, Germany, Luxembourg and Sweden. They found that in Italy, because of the longer school closures, the increase in women's childcare time has been much higher than in Spain or Germany where the adopted measures did not appear to have exacerbated the gender gap within the family.[3] In a previous work (Del Boca et al., 2020), we also focused on the outbreak of the pandemic in Italy. Using the first wave of the survey, we show that most of the additional housework and childcare associated to COVID-19 fell on women, even though childcare activities were more equally shared within the couple than housework activities.

[1] Albanesi and Kim (2021) analyzed the US data during and after the pandemic and concluded that the adverse impact of the pandemic on employment, unemployment and non-participation rates has mostly regarded women, particularly mothers. Béland et al. (2020) and Gupta et al. (2020) analysing the US case show that significant short term employment effects characterized states that implemented more tighter stay-at-home orders. The length of school closures also negatively affects labor supply, especially of mothers (Amuedo Dorantes et al., 2020).

[2] https://humanities.uni.lu/virtual-faculty/how-do-different-confinement-measures-affect-people-across-europe

[3] Interestingly, the disaggregation of household activities shows that when both partners share more housework as a consequence of COVID-19, there are differences in tasks. Carlson et al. (2020) report that in the US, in housework activities, men contribute more to grocery shopping and, in childcare activities, men spend more time playing with children, while women are more involved in school supervision.

The emergence of a possible new equilibrium passes through working arrangements of each partner, i.e., whether they work from home, they continue working at the usual work place or they stop working. However, considering only the first wave does not allow to identify the two possible sides of the relationship between COVID-19 and the division of labor within the household, since more time is needed to see if there is a change in family arrangements. Analyzing the two waves of the pandemic (as stated, the first one conducted in April 2020 and the second one in November 2020), this paper is the first one that is able to explore how and to what extent family roles have changed from the first wave of COVID-19 to the second one and thus to assess whether a new equilibrium in the intra-family division of work and family work has emerged. Moreover, we are able to link work conditions to outcomes which are important for women's status, such as their feeling of insecurity and dissatisfaction.

The paper is organized as follows: next section explains the conceptual framework and formulates our hypotheses, section 3 presents our data and empirical analysis and section 4 concludes.

2. The Division of Labor within the Household: Background and Hypotheses

Demographers have widely analyzed the relationship between the increasing role of women in the economy and society, known as the gender revolution (Goldscheider, 2000) and the division of labor within the household. During the first half of the gender revolution, women increase their level of education and their participation in the labor market, while remaining the main responsible of housework and childcare within the family. This double burden is difficult to be sustained. A new equilibrium is expected to emerge in dual income couples (Esping-Andersen and Billari, 2015), with men more involved in family's activities, including housework and childcare. During this second half of the gender revolution (Goldscheider et al., 2010, 2015) a more balanced allocation of tasks within the household is expected to emerge. Scholars have studied the emergence of this new equilibrium and its consequences on fertility rates and maternal employment (see, among the others, Matysiak, 2009; Matysiak and Vignoli, 2013; Matysiak and Mynarska, 2020; Fanelli and Profeta, 2021). For these outcomes, men's participation in housework seems to be more important than that in childcare (Carlson et al., 2020). Moreover, policies and the cultural context play an important role for the success of the second half of the gender revolution. In countries characterized by more traditional gender culture and gender roles, such as Italy, men's involvement in the family is more difficult to increase (Aassve, Fuochi and Mencarini, 2014). In these countries, in fact, women still bear most of the burden of housework and childcare.

While it seems a very intuitive channel, the attention to the role of home-working as a facilitator of the emergence of the second shift is very recent. Angelici and Profeta (2020) show that in presence of flexible work arrangements, which allow to spend a period of the working week at home, men increase their participation to housework and childcare.[4] Thus, working from home may help to rebalance the division of labor within the household (see also Schieman et al., 2009; Moen et al., 2016; Mas and Pallais, 2020).

The outbreak of COVID-19 has revamped the attention on both the division of labor within the household and working arrangements. Recent evidence has concentrated on how the increased amount of housework, childcare and support with distance learning caused by the pandemic was allocated between men and women (see, among the others, Del Boca et al., 2020; Farrè et al., 2020). In parallel, several studies have documented the spread of working from home arrangements (Angelucci et al., 2020; De Filippis et al., 2020; Dingel and Neiman, 2020). We argue that time spent at home together, due to different working arrangements, might play a fundamental role in the family task sharing and we formulate the following hypothesis.

H1. Working arrangements (mainly a larger use of working from home) support a more balanced allocation of family tasks (housework, childcare, support to distance learning) within the couple. Even though the amount of family tasks increases as a consequence of COVID-19, and in the short-run it falls disproportionately on women, in the long-run it will be more equally shared by men and women as men not working at their usual workplace spend more time at home.

Our hypothesis is that, while in the short run the additional amount of family work will fall on women, in the long run, thanks to the new working arrangements, it will be more equally shared within the couple. In other words, COVID-19 and the associated spread of home-working can push the second shift of the gender revolution in countries which, due to barriers, lack of social policies and cultural factors, were struggling to involve men in the family.

Several studies have emphasized that working from home has also important consequences on subjective well-being. Workers allowed to home-working tend to report higher satisfaction with income, social life and life in general (Chung, 2011; Moen et al., 2013; Angelici and Profeta, 2020).

In times of uncertain economic conditions due to the pandemic, individuals' well-being is expected to be negatively affected. This is particularly relevant for women, who on average have more

[4] More precisely, Angelici and Profeta (2020) analyze "smart-working" which includes not only the possibility to work in a place different from the working place (i.e., very often at home) for a period of the working week, but also with a flexible schedule.

unstable economic conditions and are shown to be particularly affected by the "she-cession" (Alon et al., 2020). Again, working arrangements may play a role to moderate this negative effect. We thus formulate our second hypothesis as follows:

H2. Working arrangements (mainly a larger use of working from home) moderate women's feeling of insecurity and dissatisfaction related to the pandemic.

We now take our two hypotheses to data with reference to Italy.

3. Data and Descriptive statistics

The Italian context

Our analysis is conducted on Italy, a country characterized by a large gender gap both in the labour market and within the family.[5] The situation has been exacerbated by the pandemic. During 2020, female participation rates have declined from 50% to 48.6% (against an average of 62 % in the rest of the European Union). Moreover, the number of inactive women increased remarkably and now three out of four women do not participate to the labor market.

The pandemic in Italy has been characterized by two waves. The first school closures started on February 25th, 2020, and the central government and regions adopted measures to reduce the spread of the virus with a severe lockdown between March 9th and May 3th. This lockdown was the strictest in Europe and the school closures lasted more than in other countries.[6] While the circulation of COVID-19 was very low in the summer, in October 2020 the number of cases increased again and the virus diffused more widely across regions. The lack of restrictive measures caused a growth in the spread of the virus, and in mid-November 2020 the reported cases were six times as high as the first wave. The new measures adopted to limit the impact on the new growing epidemic were less strict than the ones which characterized the first wave.

Data and descriptive evidence

[5] The Harmonised European Time Use Survey statistics (HETUS) data shows that there are particular patterns of how women and men use their time: women are, on average, more involved in household and care activities than men. Women perform more food management, cleaning, ironing and laundry, while men are more involved in construction and gardening. While men and women participate both in childcare, it seems that women are relatively more involved in physical care, supervision and accompanying their children, while men seem to participate relatively more in teaching, playing and talking with their children.
https://ec.europa.eu/eurostat/statistics-explained/index.php?title=How_do_women_and_men_use_their_time_-_statistics&oldid=463738

[6] From March to May 2020 the school closures lasted 103 days against an average of about 50-55 in other European countries.

In our analysis, we use data collected in two waves of a large survey conducted on a representative sample of Italian women who were working before the COVID-19 outbreak.[7] The two waves of the survey were conducted in April 2020 (during the strict lockdown) and November 2020 (during the second wave of COVID-19). The sample that will allow us to study the longer-term effects of the COVID-19 on family work, is made up of 699 Italian women who were working before the COVID-19 emergency.

Table 1 reports the descriptive statistics of the sample. The average age in our sample is 45 and 46% of respondents have a university degree. More than half (55%) of the interviewed working women live in the northern regions. Also, 55% of women in our sample live with their children and 72% with a partner. To assess the representativeness of our sample, we looked at the characteristics of the population of working women in Italy in 2020, as provided by the Italian National Institute of Statistics (ISTAT). With regard to the geographical areas, our sample shows the same distribution as the national population (ISTAT reports that 54% of working women live in the northern regions of Italy, about the same percentage as in our sample). As ISTAT reports that around one-third of working women have a degree, we acknowledge that our sample is biased toward more educated women, who have access to an online survey.

Table 1. Descriptive statistics.

	Mean	*Std. Dev.*	*Min*	*Max*
Age	44.96	9.50	26	65
Having a degree	0.46	0.50	0	1
North	0.55	0.50	0	1
Centre	0.20	0.40	0	1
South	0.25	0.43	0	1
Having children	0.55	0.50	0	1
Having a partner	0.72	0.45	0	1
Working at the usual workplace	0.58	0.49	0	1
Working from home	0.24	0.43	0	1
Not working or other	0.18	0.38	0	1

[7] The surveys were administered by Episteme, a professional survey company, with CAWI (computer-assisted web interviewing) interviews. A previous survey was conducted in April 2019 on a national representative sample of 1,249 working women (aged 25-64). Most of the 1,249 women were then surveyed again in April 2020 and November 2020. In this paper we use information collected in April 2020 and November 2020, i.e., during the first and second waves of COVID-19 in Italy.

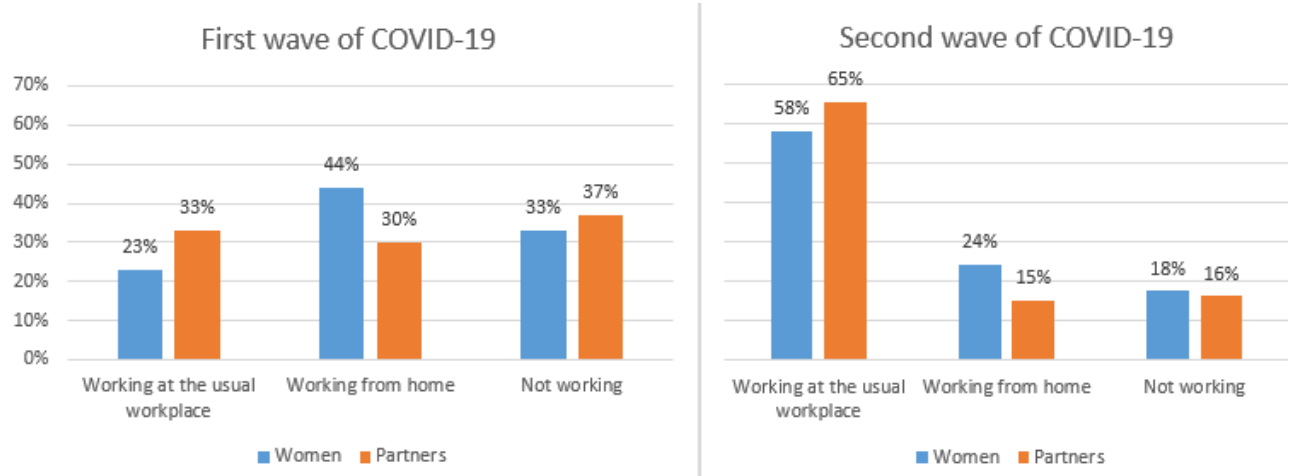
Note: The full sample is made up of 699 observations.

Since the question on the number of hours spent in family work during the lockdown and before the pandemic were asked retrospectively in the second wave, when looking at the short-term effects of the pandemic we will exploit only the women who were interviewed in both waves. This will reduce the numerosity of the sample used to study the short-run.

In this section, we first present evidence on working arrangements during the two waves of COVID-19. We then move to the division of labor within the couple, taking into account housework, childcare and support to distance learning. Finally, we look at the link between working arrangements and the division of labor within the household.

In Figure 1 we show the working arrangements of women and their partners during the first and the second wave of COVID-19. While in April 2020 only 23% of women who were working before the COVID-19 emergency are working at their usual workplace, they become the majority (58%) in November 2020. In fact, as a consequence of less restrictive measures implemented in the second wave, many more individuals are working at their usual place in November 2020.

Figure 1. Working arrangements during the first and second wave of COVID-19.



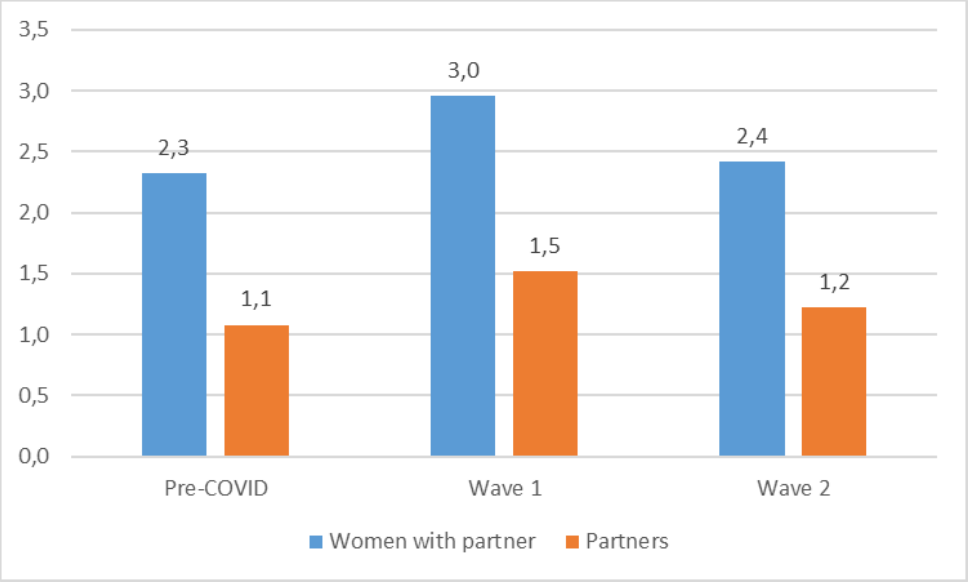
Note: Percentage of working women and their partners by working arrangement in April and November 2020.

On the other hand, the share of individuals either working from home or not working 9 months after the outbreak of COVID-19 is much lower compared to the very first months of the pandemic. In terms of gender differences, while the proportion of individuals not working was higher among men in the first wave (37% of men versus 33% of women), this is not the case in the second wave (16% of men versus 18% of women). More men than women remain at their usual workplace in

November 2020 (65% of men against 58% of women), while more women work from home (24% of women against 15% of their partners).

We now move to the division of labor within the household. Figure 2 shows the distribution of the daily hours of housework[8] spent by coupled working women and their partners before the emergency, during the first wave, and in the second wave of COVID-19. Even though both women and their partners dedicate less time to housework in the second wave with respect to the first one, women always spend more time than men doing household chores (Figure 2).

Figure 2. Hours of housework before the emergency, during the first wave, and in the second wave of COVID-19.



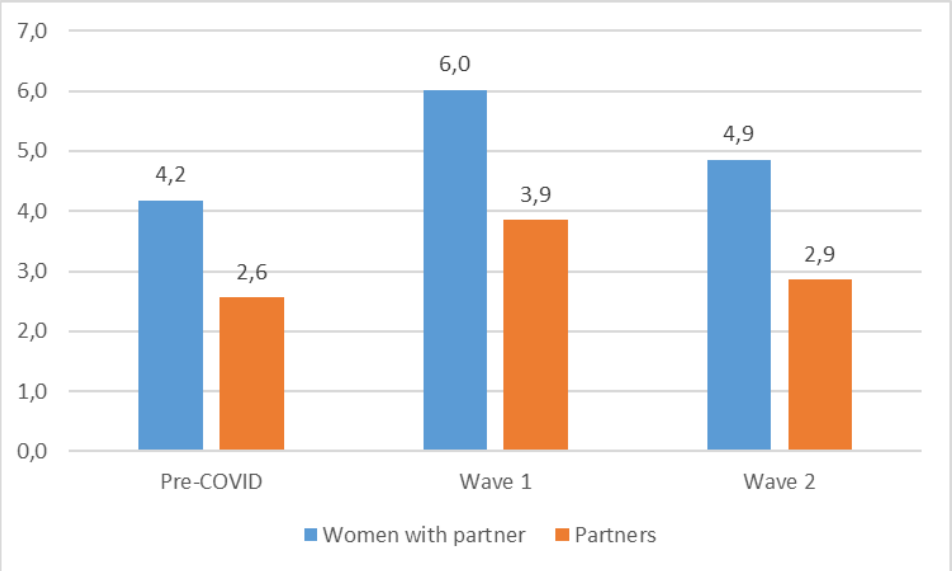
Note: The sample is made up women cohabiting with a partner.

A similar trend emerges for childcare[9] when comparing the number of hours spent before the emergency, during the first and the second wave of COVID-19. Figures 3 and 4 show the daily hours devoted to childcare, and home schooling in particular, by working women and their partners. Our data show that both women and men reduce the time spent on taking care of their children from wave 1 to wave 2. Women spend much more hours per day on childcare and such gap not only increased with the emergency (from 1.6 to 2.2 hours per day), but it did not go back to the pre-COVID level (the average difference between mothers and fathers in the time devoted to children is 2 hours as of the second wave). In other words, the gap in housework related activities has been

[8] The question on housework includes a couple of examples like cleaning and cooking.
[9] The question on childcare asks about the time devoted to children in general, including the time devoted to home schooling.

exacerbated by the COVID-19 pandemic at first and it has remained stable even after the lockdown has become less pronounced, such as in the second wave.

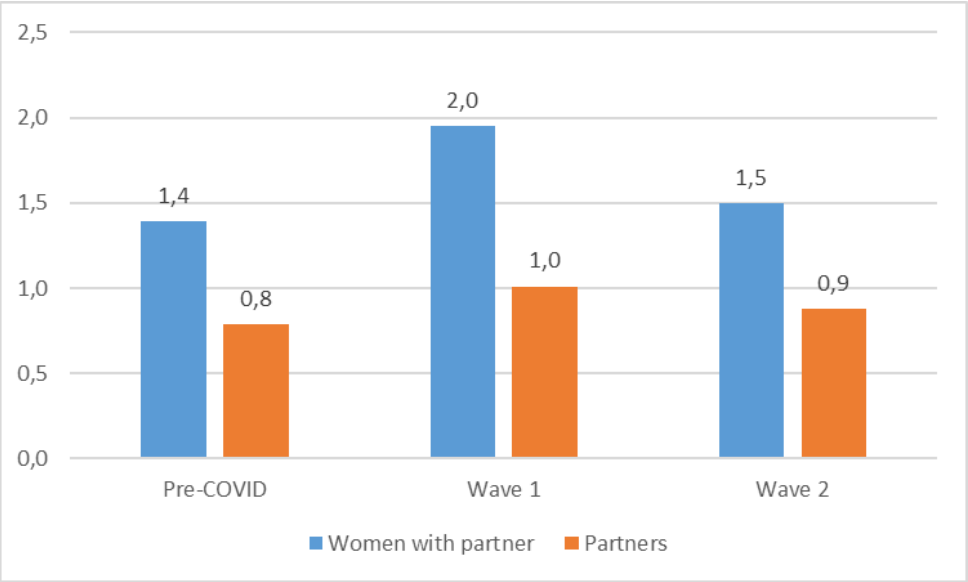
Figure 3. Hours of childcare before the emergency, during the first wave, and in the second wave of COVID-19.



Note: The sample is made up of women with children cohabiting with a partner.

Figure 4 shows the hours dedicated to children's distance learning by both partners and confirms the trend observed for housework. Women and their partners dedicate less time to the education of their children in the second wave with respect to the first one, but women still dedicate more time than men to home schooling. In fact, as of November 2020, women spend an hour and a half per day on home schooling, while their partners less than one hour confirming previous results (Carlson et al., 2020).

Figure 4. Hours devoted to children's distance learning before the emergency, during the first wave, and in the second wave of COVID-19.



Note: The sample is made up of women with children cohabiting with a partner.

To understand the link between working arrangements and the allocation of housework and childcare within the household, Table 2 shows the hours of housework during the first and the second wave of COVID-19 according to all the possible combinations of working arrangement between women and their partners. In doing so, we restrict the sample to women cohabiting with a partner.[10]

Both panels of Table 2 shows that the distribution of the housework within the couple is highly unbalanced against women. In almost all possible combinations of working arrangements, women spend significantly more hours in doing unpaid work at home compared to their partners. The highest difference experienced during the first wave (2.57 hours) concerns women who are not working because of the emergency and partners working at their usual workplace. Yet, when men are the ones not working while women continue working at their workplace, the gender difference is still positive and significant. The highest difference in the time devoted to housework during the second wave (1.81 hours) is observed when men keep working at the usual place while women work from home. However, in the opposite situation, women are still devoting more time to housework than men (2.92 against 1.40 hours per day). In both waves, the distribution of housework penalizes women in symmetric situations too, i.e., when working arrangements are the same for both partners.

[10] We recall that the question on the number of hours spent in family work during the lockdown was asked retrospectively in the second wave. Hence, when looking at the family work in the first wave, we will exploit only the women who were interviewed in both waves. This reduces the numerosity of the sample to study the short-run.

Table 2. Hours of housework during the first and second wave of COVID-19.

Panel a) Men and women's hours of housework during the first wave of COVID-19 by working arrangement.

	Partners working at the usual workplace	Partners working from home	Partners not working
Women working at the usual workplace	Women 3.14 Partners 2.19 Difference 0.95*** N=42	Women 2.47 Partners 2 Difference 0.47 N=15	Women 2.30 Partners 1.33 Difference 0.96*** N=27
Women working from home	Women 2.52 Partners 1.26 Difference 1.26*** N=50	Women 3.03 Partners 1.57 Difference 1.46*** N=87	Women 2.96 Partners 1.57 Difference 1.38*** N=47
Women not working	Women 4.03 Partners 1.46 Difference 2.57*** N=35	Women 2.38 Partners 1.38 Difference 1 N=21	Women 3.30 Partners 1.54 Difference 1.75*** N=81

Note: The sample is made up of women cohabiting with a partner (N=405).

Panel b) Men and women's hours of housework during the second wave of COVID-19 by working arrangement.

	Partners working at the usual workplace	Partners working from home	Partners not working
Women working at the usual workplace	Women 2.31 Partners 1.17 Difference 1.14*** N=241	Women 2.92 Partners 1.40 Difference 1.52*** N=25	Women 2.35 Partners 1.52 Difference 0.84** N=31
Women working from home	Women 2.56 Partners 0.75 Difference 1.81*** N=57	Women 2.82 Partners 1.43 Difference 1.39*** N=44	Women 1.91 Partners 1.30 Difference 0.61** N=23
Women not working	Women 2.53 Partners 1.04 Difference 1.49*** N=47	Women 1 Partners 3.37 Difference -2.37 N=8	Women 2.68 Partners 1.43 Difference 1.25*** N=28

Note: The sample is made up of women cohabiting with a partner (N=504).

Table 3 focuses on women with children and reports similar findings for childcare. In most of the combinations of working arrangements between women and their partners, women spend significantly more time taking care of their children during both waves of the pandemic. Panel A of Table 3 shows that women who did not work at their usual workplace during the first lockdown, spent significantly more time on childcare compared to their partners. During the second wave

(Panel B), the largest differences in the time devoted to childcare are reported when men keep working at the usual place while women work from home or do not work. In contrast, men are never spending significantly more time on childcare compared to their spouses. In symmetric situations, women are penalized as well. In fact, when both partners work at their usual workplace, women spend on average 1.41 more hours on childcare, and such a difference rises to 1.83 hours when both partners work from home.

Table 3. Hours of childcare during the first and second wave of COVID-19.

Panel a) Men and women's hours of childcare during the first wave of COVID-19 by working arrangement.

	Partners working at the usual workplace	Partners working from home	Partners not working
Women working at the usual workplace	Women 4.34 Partners 3.91 Difference 0.44 N=32	Women 2.5 Partners 2.25 Difference 0.25 N=8	Women 3.38 Partners 2.67 Difference 0.71* N=21
Women working from home	Women 2.87 Partners 1.72 Difference 1.16** N=32	Women 5.91 Partners 4.40 Difference 1.51* N=57	Women 6.87 Partners 5.27 Difference 1.6*** N=30
Women not working	Women 8.23 Partners 3.46 Difference 4.77*** N=26	Women 10.92 Partners 7.15 Difference 3.77** N=13	Women 6.65 Partners 4.74 Difference 1.91*** N=54

Note: The sample is made up of women with children cohabiting with a partner (N=273).

Panel b) Men and women's hours of childcare during the second wave of COVID-19 by working arrangement.

	Partners working at the usual workplace	Partners working from home	Partners not working
Women working at the usual workplace	Women 3.59 Partners 2.18 Difference 1.41*** N=162	Women 4.56 Partners 3.44 Difference 1.12** N=16	Women 3,3 Partners 3,4 Difference -0,1 N=20
Women working from home	Women 5.85 Partners 2.92 Difference 2.92*** N=39	Women 5.86 Partners 4.03 Difference 1.83*** N=29	Women 5 Partners 4.46 Difference 0.54 N=13
Women not working	Women 8.90 Partners 2.86 Difference 6.03*** N=29	Women 13.2 Partners 6.4 Difference 6.8 N=5	Women 5.58 Partners 3.63 Difference 0.98* N=19

Note: The sample is made up of women with children cohabiting with a partner(N=332).

3. Empirical Analysis

Working arrangements and the allocation of housework, childcare and distance learning within the couple

The descriptive evidence of Tables 2 and 3 suggests a link between working arrangements and the allocation of housework, childcare and support to distance learning. The direction of the link follows our Hypothesis 1. To better explore this link, we now estimate a set of multivariate regressions using linear probability models. In Tables 4, 5 and 6 we show for both working women and their partners the association between working arrangements, together with individual and family characteristics, and the hours devoted to housework, childcare and distance learning by women and their partners during the two waves of the pandemic (lockdown and second wave of COVID-19).

Table 4. Multivariate regression model of hours spent on housework by women and their partners during the first and second wave of COVID-19.

	Hours spent on housework by women during the lockdown	Hours spent on housework by partners during the lockdown	Hours spent on housework by women during the second wave of COVID-19	Hours spent on housework by partners during the second wave of COVID-19
Woman's age	-0.002	-0.037***	0.009	-0.022***
	(0.010)	(0.010)	(0.008)	(0.008)
Woman having a degree	0.085	0.157	-0.125	-0.042
	(0.187)	(0.195)	(0.155)	(0.156)
Woman having children	0.502***	0.126	0.444***	0.173
	(0.192)	(0.199)	(0.155)	(0.156)
Centre	-0.051	0.008	-0.015	0.158
	(0.233)	(0.242)	(0.196)	(0.198)
South	1.127***	0.045	0.899***	0.294*
	(0.218)	(0.226)	(0.177)	(0.178)
Woman working from home	0.050	-0.393	0.070	-0.363*
	(0.245)	(0.255)	(0.189)	(0.191)
Woman not working	0.567**	-0.422	0.125	0.013
	(0.254)	(0.264)	(0.210)	(0.212)
Partner working from home	-0.285	-0.045	0.288	0.697***
	(0.236)	(0.246)	(0.221)	(0.223)

Partner not working	-0.211	-0.064	-0.190	0.467**
	(0.219)	(0.228)	(0.213)	(0.215)
Constant	2.420***	3.435***	1.497***	1.928***
	(0.526)	(0.547)	(0.397)	(0.401)
Observations	405	405	504	504
R-squared	0.113	0.044	0.082	0.045

Note: Coefficient estimates from OLS regressions. The sample is made up of women cohabiting with a partner. The baseline category for working arrangements is "working at the usual workplace." During the lockdown, the average hours spent on housework by women are 3.01 and the average hours spent on housework by men are 1.57. During the second wave of COVID-19, the average hours spent on housework by women are 2.42 and the average hours spent on housework by men are 1.22. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The first and third columns of Table 4 show that, in both waves of the pandemic, the time spent by women on housework is not related to their home-working arrangement or to the working arrangements of their partners. During the lockdown, non-working women spent more hours in housework. Having children and living in the South of Italy increase women's probability of working more hours, being the only significant variables explaining the additional time devoted to the household care. The driver of the extra care seems, then, to be more culturally rooted than ruled by working necessity. For partners, instead, the working arrangements do matter on the time spent on housework: the last column of Table 4 shows that a few months after the outbreak of COVID-19, men spend more hours on housework if they are working from home or not working. Also, while women's housework is not affected by their partners' working arrangement, it seems that men are less likely to spend time on household tasks when their partners are working from home. Finally, while in the first and third columns we notice that women spend more time on housework when there are children in the household, this does not hold for men.

The results regarding time devoted to childcare, reported in Table 5, are instead more similar between partners in the longer run, showing a symmetric effect on children's care when one of the partners is absent from home (columns 3 and 4). In both waves, mothers spend more hours with their children if they do not work and, in the second wave, if they work from home. In the second wave, fathers spend more hours with their children if they do not work or work from home. During the second wave, working-from-home mothers devote 1.6 more hours to the care of children compared to mothers not at home and working-from-home fathers devote 1.30 more hours to the care of children compared to fathers not at home. Also, non-working mothers spend almost 4 more hours on childcare compared to women who keep working at their workplace, while not-working

fathers spend an hour and half more on childcare compared to men who keep working at their workplace.[11]

Table 5. Multivariate regression model of hours spent on childcare by women and partners

	Hours spent on childcare by women during the lockdown	Hours spent on childcare by partners during the lockdown	Hours spent on childcare by women during the second wave of COVID-19	Hours spent on childcare by partners during the second wave of COVID-19
Woman's age	-0.191***	-0.166***	-0.205***	-0.128***
	(0.042)	(0.041)	(0.032)	(0.025)
Woman having a degree	0.673	0.151	0.560	0.451
	(0.748)	(0.723)	(0.568)	(0.452)
Centre	-1.374	-1.824*	-0.301	-0.537
	(0.960)	(0.928)	(0.727)	(0.579)
South	1.271	0.535	0.937	0.919*
	(0.842)	(0.814)	(0.643)	(0.512)
Woman working from home	1.053	0.250	1.601**	0.437
	(0.972)	(0.939)	(0.696)	(0.554)
Woman not working	3.295***	0.737	3.951***	0.215
	(0.984)	(0.951)	(0.793)	(0.631)
Partner working from home	0.899	1.314	0.685	1.262*
	(0.963)	(0.931)	(0.824)	(0.656)
Partner not working	0.528	1.303	-0.616	1.558**
	(0.858)	(0.829)	(0.792)	(0.630)
Constant	12.041***	10.473***	12.692***	7.747***
	(2.197)	(2.124)	(1.546)	(1.231)
Observations	273	273	332	332
R-squared	0.154	0.096	0.216	0.122

Note: Coefficient estimates from OLS regressions. The sample is made up of women with children cohabiting with a partner. The baseline category for working arrangements is "working at the usual workplace." During the lockdown, the average hours spent on childcare by women are 5.79 and the average hours spent on childcare by men are 4.04. During the second wave of COVID-19, the average hours spent on childcare by women are 4.86 and the average hours spent on childcare by men are 2.86. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 6 shows that, when we consider the time spent with children in distance learning, the working arrangements either of the partner or of the woman do not affect the woman's decision of how many hours to dedicate to the children. On the other side, in both waves, men "take advantage" of

[11] Mangiavacchi et al. (2020) report that the contribution of fathers to childcare and home schooling affects in a positive and significant way children's outcomes. This is a very important result especially during a period of school closure in which children's educational outcomes are reduced and the inequality among children is growing (Moroni et al., 2020).

their partner staying home, and devote less time to help with school, if their partner works from home or doesn't work at all (approximately half an hour less). Also, when looking at the portion of childcare specifically devoted to home schooling, we notice that men spend more hours on that when they are not working many months after the COVID-19 outbreak. The educational attainment of the mother is not a significant predictor of childcare.

Table 6. Multivariate regression model of hours spent on helping children in distance learning by women and partners

	Hours spent on distance learning by women during the lockdown	Hours spent on distance learning by partners during the lockdown	Hours spent on distance learning by women during the second wave of COVID-19	Hours spent on distance learning by partners during the second wave of COVID-19
Woman's age	-0.031**	-0.033***	-0.051***	-0.040***
	(0.015)	(0.012)	(0.012)	(0.010)
Woman having a degree	0.171	0.093	0.068	0.167
	(0.262)	(0.220)	(0.205)	(0.173)
Centre	0.210	0.191	-0.188	-0.133
	(0.336)	(0.282)	(0.263)	(0.221)
South	0.275	0.397	0.315	0.083
	(0.295)	(0.248)	(0.232)	(0.196)
Woman working from home	-0.333	-0.601**	-0.157	-0.356*
	(0.341)	(0.286)	(0.252)	(0.212)
Woman not working	0.171	-0.659**	0.041	-0.425*
	(0.345)	(0.290)	(0.287)	(0.241)
Partner working from home	0.597*	0.499*	0.344	0.394
	(0.338)	(0.283)	(0.298)	(0.251)
Partner not working	0.221	0.220	0.314	0.535**
	(0.301)	(0.252)	(0.286)	(0.241)
Constant	2.941***	2.645***	3.673***	2.637***
	(0.770)	(0.647)	(0.559)	(0.471)
Observations	273	273	332	332
R-squared	0.049	0.067	0.072	0.071

Note: Coefficient estimates from OLS regressions. The sample is made up of women with children cohabiting with a partner. The baseline category for working arrangements is "working at the usual workplace." Children's distance learning is included in childcare. During the lockdown, the average hours spent on children's distance learning by women are 1.90 and the average hours spent by men are 1.05. During the second wave of COVID-19, the average hours spent on children's distance learning by women are 1.50 and the average hours spent by men are 0.88. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

To conclude, we find some support for our Hypothesis 1, although not conclusive. In fact, in line with Hypothesis 1, we find that working-from-home and non-working men spend more hours on family work than men working at the usual workplace. Yet this increase of men's involvement does not seem to lead to a reallocation of couples' roles in housework chores and childcare. The time spent on housework, childcare, and helping children in online schooling by women do not depend on their partners' working arrangements. Conversely, men devote less hours to housework and home schooling when their spouses are at home. Hence, the extra family work due to COVID-19 is a burden mainly borne by women, regardless of the time men spend at home.

Finally, in Table 7 we analyse the determinants of the difference in the daily hours devoted to housework, childcare, and children's distance learning many months after the outbreak of COVID-19. Such a gap is much higher when the woman is working from home and/or not working. The gender gap in both housework and childcare is instead lower when the partner does not work.

Table 7. Multivariate regression model of gender gaps in the daily hours of housework, childcare, and children's distance learning during the second wave of COVID-19.

	(1) Gap in hours of housework	(2) Gap in hours of childcare	(3) Gap in hours of children's distance learning
Woman's age	0.031***	-0.077***	-0.011
	(0.010)	(0.024)	(0.009)
Woman having a degree	-0.084	0.108	-0.099
	(0.186)	(0.426)	(0.165)
Woman having children	0.271		
	(0.186)		
Center	-0.174	0.236	-0.055
	(0.235)	(0.546)	(0.211)
South	0.605***	0.018	0.232
	(0.212)	(0.483)	(0.187)
Woman working from home	0.433*	1.164**	0.199
	(0.227)	(0.523)	(0.202)
Woman not working	0.111	3.736***	0.466**
	(0.252)	(0.595)	(0.231)
Partner working from home	-0.409	-0.577	-0.050
	(0.265)	(0.619)	(0.240)
Partner not working	-0.657**	-2.175***	-0.221
	(0.255)	(0.595)	(0.230)
Constant	-0.430	4.945***	1.037**
	(0.477)	(1.161)	(0.450)
Observations	504	332	332
R-squared	0.063	0.169	0.026

Note: Coefficient estimates from OLS regressions. The sample is made up of women cohabiting with a partner in the first column and women with children cohabiting with a partner in the second and third columns. The baseline category for working arrangements is "working at the usual workplace." The average gaps in the daily hours of housework, childcare, and distance learning are 1.20, 2 and 0.62, respectively. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Working arrangements and Women's Feelings of Insecurity and Dissatisfaction

We now move to our second hypothesis. Changes in work arrangements have also contributed to affect women's well-being. Several studies have emphasized that the level of anxiety of women has increased (D'Ambrosio et al., 2020). We study this outcome only in the second wave, since time is needed to observe results.

As a preliminary analysis, in Table 8 we use as dependent variables four dummies which capture women's feelings of insecurity and dissatisfaction. The respondent report whether she is concerned (1) of losing her job/close her economic activity, (2) of earning less money, (3) that she will have a lower pension when retired, given the potential interruptions of working activities, or (4) of at least one of the previous aspects. Working from home does not seem to change women's feeling of insecurity, while women not working during the second wave of COVID-19 and those with a non-working partner are those more concerned of losing their job or closing their activities. Yet, more educated women feel less insecure about their future, meaning that they are in a stronger position to cope with the current and future situation. We also control for having been directly affected by the virus through a dummy indicating whether the respondent or a member of her household have been infected.

Table 8. Multivariate regression model of women's feelings of insecurity about the future during the second wave of COVID-19.

	(1) Losing job	(2) Earning less money	(3) Lower pension levels	(4) Feeling of insecurity about at least one aspect
Woman's age	-0.008***	-0.005**	-0.000	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)
Woman having a degree	-0.112**	-0.106**	-0.079*	-0.093**
	(0.046)	(0.044)	(0.045)	(0.037)
Woman having children	0.020	0.079*	0.085*	0.085**
	(0.046)	(0.044)	(0.045)	(0.038)
Center	-0.002	-0.030	-0.026	0.000
	(0.058)	(0.056)	(0.057)	(0.047)

South	0.060	0.071	0.013	0.040
	(0.052)	(0.050)	(0.051)	(0.043)
Woman working from home	-0.093	-0.076	-0.131**	-0.096**
	(0.056)	(0.054)	(0.055)	(0.046)
Woman not working	0.167***	0.088	0.023	0.073
	(0.062)	(0.060)	(0.061)	(0.051)
Partner working from home	0.108	0.065	0.123*	0.123**
	(0.066)	(0.063)	(0.064)	(0.053)
Partner not working	0.165***	0.017	0.059	0.023
	(0.064)	(0.061)	(0.062)	(0.052)
Directly affected by COVID-19	0.059	-0.071	0.075	0.012
	(0.081)	(0.078)	(0.079)	(0.066)
Constant	0.802***	0.884***	0.624***	0.866***
	(0.119)	(0.114)	(0.116)	(0.097)
Observations	504	504	504	504
R-squared	0.081	0.045	0.036	0.049

Note: Coefficient estimates from OLS regressions. The sample is made up of women cohabiting with a partner. The baseline category for working arrangements is "working at the usual workplace." Mean values of the dependent variables from column (1) to (4) are 0.48, 0.67, 0.65, and 0.80, respectively. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Second, in line with our hypothesis 2, we investigate how working arrangements, together with other individual characteristics affect women's dissatisfaction with their current situation. In Table 9, we use as dependent variables four dummies indicating whether the respondent reported that she is currently dissatisfied with her household income, partner, life in general, or at least one of the previous aspects. The results show that women who are not working several months after the outbreak of COVID-19 are more likely to be dissatisfied about their partners and life in general. Women whose partners are not working are more likely to be dissatisfied with the household income and their life. Once again, women with a university degree are less likely to be dissatisfied.

Working from home reduces dissatisfaction with household income, although it has no effects on the other measured dimensions of satisfaction. Thus, we confirm, at least in part, our Hypothesis 2.

Table 9. Multivariate regression model of women's dissatisfaction during the second wave of COVID-19.

	(1) Dissatisfied with household income	(2) Dissatisfied about the partner	(3) Dissatisfied about life in general	(4) Dissatisfied about at least one aspect
Woman's age	-0.000	0.003	0.001	0.001
	(0.002)	(0.002)	(0.002)	(0.002)
Woman having a degree	-0.093**	-0.038	-0.085**	-0.069
	(0.045)	(0.036)	(0.041)	(0.046)
Woman having children	-0.003	0.052	-0.046	-0.000
	(0.046)	(0.036)	(0.041)	(0.046)
Center	0.120**	0.003	0.064	0.122**
	(0.057)	(0.045)	(0.052)	(0.058)
South	0.087*	-0.015	0.031	0.039
	(0.052)	(0.041)	(0.047)	(0.053)
Woman working from home	-0.159***	0.061	-0.035	-0.109*
	(0.055)	(0.044)	(0.050)	(0.056)
Woman not working	0.065	0.105**	0.123**	0.098
	(0.062)	(0.048)	(0.055)	(0.063)
Partner working from home	0.089	-0.003	0.037	0.044
	(0.065)	(0.051)	(0.058)	(0.066)
Partner not working	0.299***	0.021	0.117**	0.249***
	(0.063)	(0.049)	(0.056)	(0.064)
Directly affected by COVID-19	-0.016	-0.058	0.113	-0.005
	(0.080)	(0.063)	(0.072)	(0.082)
Constant	0.428***	-0.012	0.223**	0.453***
	(0.117)	(0.092)	(0.106)	(0.119)
Observations	504	504	504	504
R-squared	0.093	0.027	0.051	0.070

Note: Coefficient estimates from OLS regressions. The sample is made up of women cohabiting with a partner. The baseline category for working arrangements is "working at the usual workplace." Mean values of the dependent variables from column (1) to (4) are 0.44, 0.17, 0.25, and 0.53, respectively. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

4. Concluding Remarks

In several countries, the coronavirus pandemic has been associated with a "She-cession", since many women have lost their jobs and have experienced an increase of family work. The pandemic has also imposed new work arrangements, namely working from home, which has the potential of increasing men's involvement in the family and thus rebalance the asymmetry in the division of housework and childcare within the couple. To what extent new work arrangements are able to reach the goal of a more symmetric equilibrium is an empirical issue, which we have investigated

using new data on Italy, a country characterized by high gender conservativeness. We have shown that the gap in household care related activities has been exacerbated by the COVID-19 pandemic at first and has become less pronounced in the second wave, though remaining larger than before-COVID. So far, working from home has not been able to rebalance the asymmetric equilibrium within the couple: while working from home and non-working men are more involved in all family tasks (as stated by our Hypothesis 1), the time spent on housework, childcare, and home schooling by women does not depend on their partners' working arrangements. Conversely, men devote less hours to housework and home schooling when their spouses are at home.

The new work arrangements also affect women's feelings of insecurity and dissatisfaction. We find that, partially in line with our Hypothesis 2, women working from home are more satisfied with household income, although no other dimension of satisfaction seems to be affected.

Other outcomes are relevant and would need careful attention. First, women's labour supply. The growth in the burden of housework and childcare on working women after several months of COVID-19, due to the restrictive measures and school closures, is likely to have negative impact not only on women's employment rates but also on their labor supply. In fact, non-participation rates have increased more significantly among women than among men. Second, inequality. As education seems to amplify the gaps, future studies will better investigate the impact of COVID-19 on inequalities.

Overall, our results show that COVID-19 may have long-lasting impact on women. Policy interventions to sustain women's status during the pandemic and their future outcomes are needed.

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