Motherhood and the Cost of Job Search

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Abstract

Why do women experience a persistent drop in employment and wages upon becoming mothers? To highlight some of the mechanisms on the labor supply side, we study the changes in search behavior associated with motherhood. We combine two rich sources of information on the search behavior of 400,00 involuntarily unemployed workers in France. First, we use a mandatory survey to measure their selectivity in wage and non-wage amenities. Second, we track the job applications sent on a popular online platform, to measure their search intensity and analyze the precise timing of their search activities. We start by documenting that mothers are more selective than observationally similar women with no children for all non-wage amenities, but equally selective in terms of wages. We also document that mothers send 9% fewer job applications. We then analyze the timing of search activities at a high-frequency: we show that motherhood generates a drop in job applications systematically in the hours of the day when children are not at school. In addition, we analyze a reform which introduced school time on Wednesday in France in 2013-14 (instead of having Wednesdays off): we show the reform increased the number of applications sent by mothers, especially on Wednesdays. We use a simple partial equilibrium search model to help rationalize our empirical findings. Consistent with prior literature, our evidence suggests that motherhood increases the opportunity cost of market work. But our high-frequency results allow us to highlight another channel: motherhood also increases the opportunity cost of job search. This second channel has important implications for the welfare cost of motherhood and the policies that can reduce gender inequality in earnings.

1   Introduction

Motherhood is associated with a decrease in the labor market earnings of women: mothers are more likely to be jobless ; and when they they have a job, they tend to work for fewer hours and receive lower hourly wages. Understanding the causes of this motherhood penalty is key, as it accounts for 80% of total gender differences in earnings in recent years (Kleven et al., 2019). A popular explanation is that mothers choose to work less, as parenting increases the value of their home production and hence the opportunity cost of their market work. This explanation abstracts from search frictions, which in practice might prevent workers from working exactly as often as they want, or in the jobs they want. Yet, search frictions could also importantly contribute to the motherhood penalty: mothers might be more exposed to search frictions, since job search activities—just like market work—take time away from home production. If mothers have a higher value of home production, the opportunity cost of their job search should also increase. Does motherhood change the way women search for jobs, and what are the mechanisms?

To address this question, we analyze uniquely rich information on search behavior for unemployed workers who lost their job involuntarily in France. We connect two administrative datasets. First, we use data on the job applications sent on the online search platform of the Public Employment Service (PES). We count the job applications that individuals send during their unemployment spell to measure their search effort, following Marinescu and Skandalis (2021). Moreover, we exploit for the first time the information on *the exact time when the application is sent* to analyze high-frequency variation in search activities. Second, we use data from the mandatory administrative survey that French workers must take at the moment of unemployment registration, following Le Barbanchon et al. (2021). This allows us to measure unemployed workers' selectivity regarding job amenities, along four dimensions: the reservation wage, the maximum commute distance, the desired weekly hours of work (full-time versus part-time), the desired duration of the work contract (open-ended versus fixed-term). The linked datasets covers about 400,000 unemployment workers who involuntary lost their job, in 2013-2017. We also collect information on their dates of re-employment, as well as a rich set of individual characteristics.

Isolating the role of search costs is challenging, as motherhood might change women's search behavior for many entangled reasons. To fix ideas, we start by presenting a simple job search model, where motherhood increases the value of home production. This means that motherhood increases the opportunity cost of market work, and the model thus predicts that unemployed mothers provide less search effort and are more selective (i.e. they need more wage and non-wage amenities to accept a job offer). We further assume that people cannot both search and make home production in the same time, such that motherhood also raises the opportunity cost of searching for a job. In this extended model, motherhood decreases search effort even more, but the effect on selectivity is attenuated. Our data allow

us to study these predicted effects of motherhood on search behavior, but the two models have qualitatively similar predictions, so it is difficult to tell them apart. We hence introduce another realistic feature in the model: we consider that the value of home production only increases for mothers in the times of the day when children are home (i.e., instead of at school). With this additional assumption, mothers should decrease their search effort more in times when children are home than in the rest of the day. We can hence test empirically that motherhood does indeed increase the cost of job search, by analyzing mothers' high-frequency changes in search activities.

We start our empirical analysis by describing the differences in search behavior between mothers and similar women with no child. We successively analyze their search selectivity and their overall search effort. We control for differences in demographic characteristics and past labor market history: our estimates of the "motherhood gaps" in job search hence compare women who had a similar labor market trajectory until they lost their job. We see that unemployed mothers are more selective than similar women with no child (non-mothers thereafter) regarding non-wage amenities: their maximum commute distance is 8% lower, they are 2 ppt more likely to want an open-ended and 5 ppt more likely to want a part-time job. However, their reservation wage remains similar to that of non-mothers. Overall, mothers are less selective in all amenities, except for wages. It is in line with the model prediction about search selectivity, and suggests that motherhood might increase the value of non-wage amenities relative to wage. But the most striking difference is that mothers send 9% fewer job applications. Consistently, we observe that their rate of re-employment also drops, by 7%. In contrast, men do not exhibit large differences in search behavior associated with parenthood. Fathers' search behavior is very similar overall to that of similar men with no child, though their reservation wage is slightly higher (by 1%). The motherhood gaps in search behavior are consistent with the predictions of search models where motherhood increase the value of home production—both with and without the search cost channel. These novel descriptive statistics hence provide a new validation of this classical explanation for the effect of motherhood. However, they do not allow us to test for the role of the cost of search cost.

We then analyze mothers' high-frequency changes in search activities. We break down our overall count of applications, into counts of applications sent in 10-minutes intervals, to measure the intensity of search effort at various times of the day. We find that mothers send their applications at very different times of the day than similar non-mothers. They send much fewer applications around lunch and between 4pm-9pm, while they send many more applications during the morning (9am-noon), in the afternoon (2pm-4pm) and in the evening (9pm-midnight). Using the French Time Use Survey, we compare these estimates with statistics on the presence of children during these same 10-minutes intervals. We see that the times when mothers send fewer applications precisely correspond to times when unemployed mothers tend to be in the same room as their children. Conversely, the times

when mothers send more applications correspond to times when they are less likely to be in the same room as their children, and also correspond to typical school times or sleep times for children. In contrast, when we reproduce the same analysis for men, we see that fathers have a much more similar timing of search behavior than non-fathers. This pattern is similar if we analyze changes in search at different frequencies: in different days of the week (mothers search less during weekends than non-mothers), or weeks of the year (mothers search less during school holidays than non-mothers). The results remain identical when we construct individual balanced panels, and estimate high-frequency within-individual changes in search. These results provide the first evidence that mothers adjust the timing of their search activities to their family life.

These results indicate that it is more costly for mothers to search in the periods when they are with their children. During unemployment, this suggests that the mothers face higher search costs—to the extend that shifting their search activities to times when they are not with their children is costly. For on-the-job search, this suggests that motherhood should increase search costs even more. It is likely that employed mothers have to search after work, in moments when children are present, and hence when searching is very costly. Searching on-the-job might hence induce a similar disutility as working very long hours.

Finally, we study how public childcare affect mothers' search behavior and employment. The 2014 reform of school time in France provides an ideal setting to test these effects. It introduced school time on Wednesday mornings for kindergarten and primary school children (i.e. most children between three and eleven years old), as they did not have any school on Wednesdays before (Duchini and Effenterre (2023)). We estimate the effect in a simple differences-in-differences model, where we assume that the reform only treated unemployed mothers such that unemployed women with no children can serve as a control group. We find that the reform had a significant positive effect on unemployed mothers' search effort overall, driven by a large positive effect on search activities on Wednesdays. The motherhood gap in applications on Wednesday hence went from 13% before the reform to 11% afterwards. In contrast, we find that the reform had very limited effects on mothers' selectivity. Finally, we estimate a similar differences-in-differences model for men, and show that the reform had no impact on any dimension of fathers' search behavior. Our results are qualitatively consistent with our model with a search cost channel: if providing additional public childcare both decreases mothers' cost of working and of searching, it should have a large positive effect on mothers' search effort, and a limited effect on their selectivity.

We briefly discuss policy implications. Providing unemployed mothers more or cheaper access to daycare services might boost their search activity and their reemploment rate, similar to the school schedule reform. Indeed mothers often do not have priority for public daycare if they are unemployed, and they might choose to not pay for daycare during unemployment given their lower income. These might also contribute to increase the cost of job search. Besides, our results suggest that helping mothers in their job search (eg, through

targeted counselling) might represent relatively easy-to-implement policies to reduce gender inequality on the labor market.

Our paper makes several contributions to the literature on gender inequality. First, we contribute to the literature on the consequences of mothers' time use on their career. Mothers have been found to adjust the timing of their work to their family life. Further, the literature has highlighted various channels through which this might negatively affect their hourly wage: jobs which leave workers flexibility with their schedule tend to offer a lower pay (e.g., Goldin (2014), Goldin and Katz (2015)) ; within these flexible jobs, working at specific times might allow workers to increase their hourly wage by responding to increased demand or by being more productive (Bolotnyy and Emanuel (2021), Adams-Prassl (2020)). We provide the first evidence that mothers also adjust the timing of their job search to their family life, and discuss how this affects their career.

Second, we provide novel descriptive evidence of differences in search behavior associated with parenthood. We hence contribute to a recent strand of literature which analyzes gender differences in job search behavior (Mas and Pallais (2017), Reuben et al. (2017),Wiswall and Zafar (2018), Le Barbanchon et al. (2021), Fluchtmann et al. (2020)). The gender differences in search behavior that might appear upon the arrival of children are likely the most detrimental to gender equality, as this is when the labor market trajectories of men and women sharply diverge (e.g., Kleven et al. (2019)).[1] Yet, there is very limited evidence on how job search behavior might change in relation to parenthood.

Third, we add to a recent strand of literature documenting gender differences in search frictions. Illing et al. (2022) analyze the scarring effect of being displaced separately for men and women. They find, that women experiment a larger earnings loss in the years following a job displacement than men who are displaced from similar firms—consistent with the idea that women face larger search frictions. The authors also show that this scarring effect of displacement is particularly large for mothers and provide indirect evidence that one channel might be that women search less. We confirm this mechanism with direct data on job search. Evidence that women benefit less from on-the-job search can be found in Caldwell and Harmon (2019). The authors find that women are less likely than men to use information on job opportunities at other firms to bargain up their wage.

2 Theoretical framework

To fix ideas, we start by presenting a simple job search model, where motherhood increases the value of home production (e.g. due to social norms).

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[1]This includes papers by Waldfogel (1998), Lundberg and Rose (2000), Sigle-Rushton and Waldfogel (2007a,b), Correll, Benard and Paik (2007), Paull (2008), Bertrand, Goldin and Katz (2010), Wilde, Batchelder and Ellwood (2010), Fernandez-Kranz, Lacuesta and Rodriguez-Planas (2013), Fitzenberger, Sommerfeld and Steffes (2013),Goldin (2014), Adda, Dustmann and Stevens (2015), Angelov, Johansson and Lindahl (2016), and Goldin and Katz (2016).

Baseline model: We consider a partial equilibrium search model, where unemployed workers choose their reservation amenity r and their search effort s ($\in [0, 1]$). We assume that mothers are more productive at home (parenting): For non mothers, $\alpha = 0$; for mothers $\alpha > 0$. Moreover, we distinguish between two type of search effort: the one exerted in hours when there is no school s_1, and the one exerted during school hours s_2 ($s = s_1 + s_2$). We assume that the search cost higher if you don't smooth your search effort across hours. The value of being unemployed can be written:

$$(1 - \beta) \cdot U = u(\alpha + b) - c(s_1, s_2) + \beta \cdot (s_1 + s_2) \int_r (E(a) - U) dH(a)$$

In this model, motherhood increases the opportunity cost of market work. Figure 1 presents the predictions for the effect of motherhood on reservation amenity (Panel A/) and search effort (Panel B/). Mothers have a higher reservation amenity (i.e. they need more wage and non-wage amenities to accept a job offer), and a lower search effort. Moreover, the doted line shows these predictions, depending on the magnitude of the increase in home productivity we assume for mothers. We see that the more productive in parenting women become, the less they provide search effort and the more selective they become.

Extended model: We further assume that people cannot both search and make home production in the same time, such that motherhood also raises the opportunity cost of searching for a job. We consider that the value of home production only increases for mothers in the times of the day when children are home (i.e., instead of at school). The value of being unemployed can be written:

$$(1 - \beta) \cdot U = u(\alpha \cdot (1 - s_1) + b) - c(s_1, s_2) + \beta \cdot (s_1 + s_2) \int_r (E(a) - U) dH(a)$$

In Figure 1, the continuous line presents the predicted effect of motherhood on reservation amenity (Panel A/) and search effort (Panel B/), depending on the magnitude of the increase in home productivity we assume for mothers. In this extended model, motherhood decreases search effort even more, but the effect on selectivity is attenuated. Additionally, we show in Panel C/ the predictions for the effects on search during school hours, or no-school hours. The model predicts that mothers should decrease their search effort more in times when children are home than in the rest of the day. We can hence test empirically that motherhood does indeed increase the cost of job search, by analyzing mothers' high-frequency changes in search activities.

The predicted effect of the reform of school schedule: The two models generate also slightly different predictions for the effect of the reform of school schedule (adding school time on Wednesday morning) on mothers' search. In the baseline model, the reform should decrease their opportunity cost of working: mothers can no longer generate valuable

parenting production on Wednesday morning when they are unemployed. This is similar to having mothers experience a decrease in their productivity in parenting α, in Figure 1. This should hence *decrease* their selectivity and increase their search effort. In the extended model, the reform will have an additional effect, on top of the increased opportunity cost of working. The reform should also decrease mothers' opportunity cost of searching—on Wednesday morning. This should hence further increase the search effort, and should *increase* mothers' selectivity. The extended model hence predict an even larger overall effect of motherhood on search effort, while the overall effect on selectivity is ambivalent. Moreover, the model predicts that search should increase the most on Wednesday morning (as this period goes from being a school period to a no-school period in Figure 1 C/).

3 Data and empirical strategy

3.1 Data

We match various types of administrative datasets from the French Public Employment Service (PES), Pôle Emploi.

Online job applications We first exploit data on the job applications sent on the PES online search platform, following Marinescu and Skandalis (2021). The French PES administers a popular search platform. In 2013, in an effort to support recruiting, employers were offered the possibility to include a link in their job ad to a standardized application procedure: in that case, job seekers can only apply to the job by filing a detailed form online. These online applications are tracked on the information system, with information on the exact time of the applications, a vacancy identifier, a firm identifier, and a individual identifier. We match this dataset with vacancy data to have information on the characteristics of the job that are visible to the job seeker when she applies: type of contract, type of occupation, posted wage (reported in about half of vacancies), number of hours, required education level, required skill level. We also match this dataset with firm and individual to know which job seeker applied, and whether this person was subsequently hired in the firm.

In the first part of the empirical analysis, we analyze differences associated with motherhood in search intensity at the start of the unemployment spell, measuring search intensity by the count of applications sent by each jobseeker: we sum the number of applications sent during first quarter of unemployment, or up to re-employment for job seekers leaving before the end of the first quarter (for them, we compute the daily rate of applications before re-employment and convert it into a quarterly rate). We also consider two alternative measures of search intensity. First, we count the number of applications sent to various types of jobs separately (various sectors, various firm sizes, and various types of contract). Second, we measure the speed at which job seekers apply to a newly posted vacancy (i.e.

the number of days between the date when the vacancy is posted and the date when the person applies): the more frequently a jobseeker checks the online platform, the faster she should apply to a newly posted vacancy. In the second part of the empirical analysis, we analyze high frequency changes in search activities, by counting the number of applications sent during the first quarter of unemployment at a specific time of the day, day of the week or week of the year.[2] Note that the online search platform is only one out many possible search channels for job seekers: it does not capture all the applications sent by a jobseeker. But Marinescu and Skandalis (2021) provide evidence that it represents a valid proxy for search effort overall, and we make sure that our results are not biased by changes in the fraction of search that is done on the online search platform (we discuss this further in section 3.3).

Mandatory survey on search criteria Second, we measure job seekers selectivity, based on the information that all French job seekers report when they register as unemployed in a mandatory survey administered by the Public Employment Services, following Le Barbanchon et al. (2021).[3] More specifically, people are asked "What minimum gross wage do you accept to work for?" and "What length of daily commute (one way) would you accept?". We analyze four dimension of selectivity: the reservation wage, the maximum commute distance, whether people want a full-time or a part-time job, and whether people want an open ende or a finite duration contract, Respondents can provide their reservation wage as a hourly, monthly or annually wage. We convert all answers in hourly wages. Job seekers can state their maximum commute distance either in minutes or in kilometers. Following Le Barbanchon et al. (2021), we convert the maximum commuting time for those who declared in minutes into kilometers, assuming that average commuting speed is 35 km/hour.

Other data sources Our main employment outcome is the time to re-employment, i.e. the delay between the date of registration as unemployed, and the date of the first new job found. We have this information in our linked datasets from the employers' mandatory declarations of new hires (DPAE). This data source presents two limitations: first, the DPAE do not include permanent contracts specific to the public sector ; second, they do not contain information on wages. Therefore we also provide additional analyses using the FH-DADS, a linked dataset of unemployment registered and employment data available for 1/12th of the labor force between 2009 and 2012.[4]

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[2]We consider job applications during alternative time windows in robustness checks: first two or six months of unemployment.

[3]Le Barbanchon et al. (2021) show that the monitoring/sanctioning role of the PES does not lead job seekers to misreport their reservation wage and commute.

[4]Note that the samples do not overlap, as our main study dataset spans unemployment spells started between 2013 and 2017, while this alternative dataset spans unemployment spells started in 2009-2012. We hence construct from FH-DADS a separate study dataset, by applying the same sample restriction and

We also use data from the French Time Use survey. It provides an additional source of information on the allocation and the amount of time spent searching for a job, or in presence of children among French unemployed workers.

3.2 The institutional context

School schedule in France In France, education is compulsory from age six to sixteen, during the study period. Parents can send their children to free public pre-kindergarten (école pre-maternelle) when they are two, or to kindergarten (école maternelle) at the age of three. 23 percent of two-year-old children and 95 percent of children aged three to five attend this pre-school stage (Goux and Maurin 2010). Before 2013, kindergarten and primary school children (most children between three and eleven years old) went to school four days a week (on Monday, Tuesday, Thursday and Friday) and for six hours a day—plus a 2-hour lunch break in the middle. Generally, on those days, school is from 8:30 am- 11:30 am in the morning and from 1:30pm-4:30 pm in the afternoon, for pupils in kindergarten and primary school (from 3 years old to 10 years old).[5] On those days, children wake up around 7:00am and go to bed around 8:45pm on averrage.[6] Secondary schools' schedules are similar, but the number of hours children spend at school increases with grade and children may finish their day later or have class on Wednesday afternoon or Saturday morning. French school years go from September to June, and include four two-weeks long holidays around the months of October, December, February and April.

The reform of school schedule In 2013-2014, school schedules were reformed in order to spread teaching time more evenly across weekdays for kindergarten and primary school children. The reform added teaching time on Wednesday mornings in most schools, generally from 8:30 to 11:30am. On other weekdays, the teaching time was slightly shortened (by about 45 minutes), which was in principle replaced by free extra-curricular activities. The effect of the reform was hence twofold: first, it increased public childcare provision; second, it spread it more evenly across weekdays. Twenty percent of French municipalities chose to do it in 2013; the rest only adopted the new system in 2014. For a comprehensive description of this reform, see Duchini and Effenterre (2020).

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constructing the same variables as in our main study dataset.

[5]Examples of school schedules could be found in documents from the ministry of education: http://cache.media.education.gouv.fr/file/01_Janvier/67/1/2013_infographie-rythmes-scolaires_emploidutemps_239671.pdf

[6]See for example the result from a survey conducted by one of the important health insurance companies: https://institut-sommeil-vigilance.org/wp-content/uploads/2020/02/BJ23423-OpinionWay-pour-INSV-Fevrier-2022-070322-post-reunion.pptx.pdf

3.3 Empirical strategy

3.3.1 The motherhood gap

We estimate the following empirical model, to measure the gap in search associated with parenthood, separately for men and women:

$$Search_{i,t_0} = \alpha Child_{i,t_0} + X_{i,t_0}\beta + \varepsilon_{i,t_0} \tag{1}$$

Where $Search_{i,t_0}$ is the search behavior of individual i at the start of unemployment, for the unemployment spell which began at the calendar date t_0. $Child_{i,t_0}$ is dummy equal to one if individual i has at least one child when becoming unemployed. X_{i,t_0} is a vector of time-varying and fixed characteristics for individual i at time t_0. γ_{t_0} are time fixed effects. We successively consider several search outcomes: the count of job applications, the logged reservation wage, and the logged maximum commuting distance. When we take the number of applications, as this outcome is a count variable with a mass point at zero, we estimate Poisson count models.[7] We report the incidence rate ratios minus one, which can be interpreted as semi-elasticities.

It is important that motherhood is not associated with a change in the proportion of jobs made through this specific search channel in the first part of the analysis. To test that, we show that motherhood does not change the proportion of jobs found on the search platform (versus through another channel). We also build two alternative measures of search intensity. First, we address the potential bias coming from the selection of new jobs that are represented on the online PES platform: we compare new hires (DPAE) with posted vacancies on the PES search platform open to online applications: in terms of sector, contract type, and firm size. In robustness check, we re-weight each application by the inverse probability that the type of job is represented on the online search platform. We show that motherhood is associated with a similar change in the weighted number of applications, which allows us to make sure that the change is the number of applications is not driven by a shift in the composition of applications towards types that are more or less represented on the online search platform. Second, we use different measures of search intensity that should not be affected by the selection on the online search platform: we measure search intensity by the speed at which job seekers apply to a newly posted vacancy, i.e. the number of days between the date when the vacancy is posted and the date when the person applies. For the second part of our empirical analysis, where we focus at within-individual high-frequency changes in search effort, the measurement issue appears less concerning. We also note that, if anything, it could create an attenuation bias, as women probably do more of their job search online, during the periods where they have

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[7]Poisson regression models do not suffer from the incidental parameter problem, and allow for convenient inclusion of fixed effects. In order to allow for misspecification of the Poisson distribution, we present coefficients estimated using a quasi-maximum likelihood method (Wooldridge, 2010).

less time for job search.

As the observable labor market characteristics we are able to include as controls probably miss aspects of this selection that are relevant for job search behavior, we caution away from interpreting our estimates causally: we present them as a conditional gap, which is an interesting piece of evidence in itself. Our robustness analyses however suggest that the biases might relatively be small. We find similar estimates when we leverage within-individual changes in search behavior around the arrival of children, for individuals who have several unemployment spells in our sample. This suggests that the selection on fixed characteristics are not an important concern. We observe that our child gap estimates remain unchanged when we focus on individuals who have experienced a mass layoff, although this selection might be more similar across family statuses than for all involuntary separations. We also note that our estimates of the child gap are not very sensitive when we include our controls one by one.

3.3.2 Within-individual high frequency changes in search

In a second part, we exploit the high frequency of our measure of search behavior. To further investigate how childcare affect job search, we measure the effect of having a child on the number of applications sent per unit of time, conditional on the observables. Formally we run regressions of the form:

$$Search^k_{i,t_0} = \alpha Child_{i,t_0} + X_{i,t_0}\beta + \gamma^k + \varepsilon_{i,t_0} \qquad (2)$$

Where $Search^k_{i,t_0}$ is the number of job applications send by individual i during time interval k. The French Time Use Survey (Section 3.1) asks about respondents' activity per 10 minutes slots. As we want to compare the child penalty over the course of the day to the information on childcare duties from the TUS we have decided to use this very fine grain unit of time minute slot. In practice we ran Equation 2 for every 10 minutes slots from 7 am to midnight. Week ends and holidays are excluded from the analysis. We estimate in Poisson count models.

3.3.3 The effect of the reform of school schedule:

The design and the implementation of the reform provide an interesting natural experiment allowing to measure the effect of additional childcare on job search. We use differences in-differences and compare job seekers with or without children, before or after the reform, separately for men and women:

$$Search_{i,t_0} = \alpha_1 Child_{i,t_0} + \alpha_2 Reform_{i,t_0} + \alpha_3 Child_{i,t_0} \cdot Reform_{i,t_0} + X_{i,t_0}\beta + \varepsilon_{i,t_0} \qquad (3)$$

We consider various search outcomes, and in particular the number of applications sent

each day of the week (as always, during the first 3 months of the unemployment spell).[8] $Reform_{i,t_0}$ is a dummy equal to one if the reform was implemented in the city of individual i, at the date t_0.

4 The motherhood gap in job search and job finding

4.1 The motherhood gap in search selectivity

We start by measuring the differences in search selectivity. We focus on four measures of selectivity: the reservation wage, maximum commute distance, desired type of contract (open-ended or fixed-term), and preferred working time arrangement (full-time or part-time). We analyze the differences between parents and non-parents, conditional on observable characteristics (as described in Section 3.3.1): education (five dummies), experience (five dummies), and age, city, and sector fixed effects in each regression. Results are presented in the first four columns of Table 2, with Panel A and B reporting the results for women and men, respectively.

Compared to women without children, mothers tend to search for jobs that are closer, more secure, and with fewer work hours. Their maximum commute distance is 7% lower (Column 2), they are 2 percentage points more likely to seek an open-ended contract (Column 3), and 5 percentage points more likely to prefer a part-time job (Column 4). However, the reservation wage (Column 1) is the only parameter that does not differ between mothers and other women. Fathers, on the other hand, show fewer differences from men without children. Their reservation wage is slightly higher (+1%, Column 1), and they are slightly more likely to look for an open-ended contract (+.8%). However, their maximum commute distance and likelihood of preferring a part-time job are not affected.

Overall, mothers tend to be more selective than comparable women without children, while fathers do not differ significantly from other men. Figure 2 shows that most of the differences are observed at an early age. Among 30-year-old women, mothers have a maximum commute distance that is 10% shorter, and they are 7 percentage points more likely to seek a part-time job. In contrast, mothers in their 50s do not differ significantly from other women of the same age. No significant changes are observed among men, except for the reservation wage, which shows a child gap that only exists after 40 years of age.

4.2 The motherhood gap in search intensity

Parenthood might not only be associated with different levels of selectivity, but also a different amount of effort and time dedicated to job search. In Column 5 of Table 2, we estimate the child gap in the number of applications sent at the start of an unemployment

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[8]Summer holidays are removed from the analysis. Applications and vacancies are far less numerous during those periods and school are always closed.

spell in a Poisson count model. After controlling for search criteria and individual characteristics, mothers send 9.5% fewer applications than comparable women with no children. In contrast, fathers do not differ significantly from comparable men without children.

variation in the number of applications may heavily depend on the number of available job opportunities, which is determined by individual characteristics and search criteria, both of which can be affected by having children. Therefore, to interpret the variation in applications as changes in the time or effort devoted to job search, our models control for job seekers' characteristics, as well as the four search criteria discussed in the preceding subsection: reservation wave, maximum commute distance, desired type of contract, and preferred working time arrangement.

4.3 The motherhood gap in re-employment

The effects of children on search criteria and search efforts may contribute to the creation of the child gap in job finding. In the last columns of Table 2, we examine the effect of children on the probability of being employed. One year after the start of the unemployment spell, mothers are 9% more likely to still be unemployed than similar women without children (Column 6). In contrast, fathers do not differ from other men. The observed difference remains significant, around 6.8%, even after controlling for search criteria.

5 Mothers' trade-off between job search and childcare

In this section, we document the impact of children's schedules on parents' job search behavior. We start by studying within-day variation, before turning to lower time frequencies (within-week and within-year).

5.1 The effect of the presence of children on job search

To document how children's schedules affect adults' search activities, we compare the evolution of the child gap to the evolution of childcare activities over the course of the day. First, we estimate the parenthood gap in the rate of applications *for each 10-minutes period of the day* (as described in Section 3.3.2). Estimating the parenthood gap in each 10-minutes interval instead of directly looking at the count of applications allows to control for factors that affect people's activities at different time of the day (sleep, lunch), etc. [9] Second, we use the French Time Use Survey to compute, *for each 10 minutes period of the day*, the proportion of mothers and fathers declaring having at least one child with them in the room. Results are shown in Figure 3 (a) for women and (b) for men. The solid lines present the evolution of the child gap in job search (in %, measured using Poisson regressions). The dark grey bars indicate the proportion of parents declaring that at least

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[9]We describe in appendix Figure A.1 the rate of job applications through the day for different groups.

one of their children was in the room at the time (in %). Last, the light grey areas indicate school time and children's night.

Parents search less than non-parents when children are present: at lunchtime (11:30 am to 1:30 pm) and at the end of the afternoon (4:30 pm to 9:00 pm). Conversely, they search more, or similarly, when kids are not around: in the morning (8:30 am to 11:30 am) and at the beginning of the afternoon (1:30 pm to 4:30 pm), when they are at school; or, in the evening, when they are slipping (from 9:00 pm onward). Strinkingly, the effect of children's schedules on job search is much more pronounced for mothers. Women with children send between 20% and 60% more applications than comparable women without children in the morning and after bedtime. On the contrary, their job search activity is 20% less intense around lunchtime and between the end of school and the night. Fathers' divergences from comparable men without children are less important and rarely exceed 20%.

Our results suggest that children might have a larger on mothers' job search activities for two reasons. First, mothers spend more time with their children. In the Time Use Survey, more than 50% of surveyed mothers declare being in the same room as one of their children, in the periods outside school time and night. These numbers rarely exceed 40% for fathers. Second, mothers' job search is more impacted by the presence of their children. Indeed, the correlation between the parenthood gap and the proportion of parent with their child present is -.76 for women versus -0.43 for men (see appendix Figure B.6 (b))

5.2   Robustness checks and additional results

Additional results on daily variation   The results presented in Figure 3 are robust to using alternative specifications. First, comparing the child gap in job search to the time parents dedicate to childcare (instead of child presence) leads to similar results (see Appendix Figure B.1). Second, using OLS instead of Poisson regressions lead to the same conclusions (see Appendix Figure B.4). It also indicates that the increase in job search that we observe among mothers after bedtime is modest in absolute value (while important in proportion). Moreover, we find that women above 39 (top third of our sample) are less affected than others (see Appendix Figure B.3). This is consistent with the idea that they have older children who require less care.

Variation across days and weeks   The intensity of childcare varies within the course of the day but also within the week, or the year. In Table 3 we measure the child gap in job search over the weekend (Column 3) and compare it to the child gap on weekdays (Column 4). For women, the former (-14.5%) is slightly bigger than the latter (-12%), but the difference is not significant. This contrasts with men, among whom fathers spend *more* applications than nonparents over the weekend.[10] Columns 5 and 6 present the child

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[10]In the French time use survey, parents spend more time with their children during the weekend: mothers declare spending 8.8 hours per day with at least one child in the same room over the weekend against 6.8

gap during holidays and normal school weeks. For mothers, the former is significantly more negative than the latter. On average, their job search activity is 18.7% smaller than women without children during holidays. It is "only" 11.5% smaller on other weeks. On the contrary, fathers are not particularly affected by school holidays.

The effect of weekends and holidays on job search is confirmed when using a daily panel at the individual level, with individual fixed effects, in table B.7). This alternative specification allows us to address potential concerns of differential selection into unemployment in specific times (e.g. holidays) for parents and non-parents. Additionally, we also include controls for the number of job offers per day, county, and sector, and for day of the spell or day of the year. The inclusion of an extensive set of controls does not change the magnitude of the effect of holidays and only amplifies the effect of weekends on mothers.

Altogether, the results presented in Figure 3 and Table 3 depict a consistent picture. Mothers significantly decrease their job search when their children are at home. This is true at daily, weekly, and yearly levels. The decrease is not compensated when children are not home. Moreover, those fluctuations could be detrimental per se. Daily interruptions may lead to less efficient job search, a mechanism similar to what is observed by Adams-Prassl (2021) on the cost of interruption on the online labor market. At the weekly or yearly level, lower job search during long periods may lead to missing opportunities.

6 The effect of the school schedule reform on job search

This section explores the impact of the school schedule reform, which increases school time on Wednesdays, on job search (see Section 3.2) As highlighted by the model presented in Section 2, the reform could affect mothers' job search through two channels. First, it might decrease their opportunity cost of working: mothers can no longer generate valuable parenting production on Wednesday morning when they are unemployed. This should hence decrease their selectivity and increase their search effort. Second, the reform might decrease their opportunity cost of searching—exclusively on Wednesday morning. This should hence increase the search provided on Wednesday morning, but should increase mothers' selectivity.

6.1 The effect on job search

The results are presented in Table 4, with panel A for women and panel B for men, as described in Section 3.3.3. The first four columns indicate that the reform did not significantly impact parents' selectivity. Both reservation wages and maximum commute distance remain unchanged after the reform. Mothers were slightly less likely to look for a part-time job (-.5%), and fathers were slightly more likely to look for an open-ended contract (+.4%),

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hours per day the rest of the week. The same is true for fathers with 6.2 hours against 4.7 hours.

but these results are only marginally significant. The main effect is observed on search intensity (Column 5). After the reform, mothers' job search on workdays increased by 3.9%.

The effect of the reform on job search seems to increase mothers' likelihood of finding a job. Indeed, Column 7 of Table 4 indicates that they are 2.3% more likely to be employed one year after the beginning of their unemployment spell. Results are similar when using a duration model (see Appendix Table B.9, column 6).

6.2 The effect on mothers' time allocation

In fact, Figure 4 shows that the effect is concentrated on Wednesday mornings, which is the specific time affected by the reform. On this morning, mothers' job search increased by 15% after the reform. There also seems to be a spillover effect towards the end of the week. Mothers' job search is slightly higher on Wednesday afternoon and on Thursday (see Appendix Table B.9. No effect is observed on fathers.

7 Conclusion

Does motherhood change the way women search for jobs, and what are the mechanisms? In this paper, we analyze uniquely rich information on search behavior for unemployed workers who lost their job involuntarily in France. We count the job applications that individuals send during their unemployment spell to measure their search effort, and we exploit for the first time the information on *the exact time when the application is sent*. We combine it with data from the mandatory administrative survey on job seekers' selectivity. These data allow us to provide the first evidence of differences in job search associated with motherhood: mothers are more selective than observationally similar women with no children for all non-wage amenities, but equally selective in terms of wages ; mothers send 9% fewer job applications. We then analyze the timing of search activities at a high-frequency: we show that motherhood generates a drop in job applications systematically in the hours of the day when children are not at school. Finally, we analyze a reform which introduced school time on Wednesday in France in 2013-14 (instead of having Wednesdays off): we show the reform increased the number of applications sent by mothers, especially on Wednesdays.

We use a simple partial equilibrium search model to help rationalize our empirical findings. Consistent with prior literature, our evidence suggests that motherhood increases the opportunity cost of market work. But our high-frequency results allow us to highlight another channel: motherhood also increases the opportunity cost of job search. Indeed, our results suggest that mothers face higher search costs during unemployment—to the extend that shifting their search activities to times when they are not with their children is costly. On-the-job search is probably even more costly for mothers, as it is likely that employed mothers have to search after work, in moments when children are present, and hence when

searching is very costly. The effects of these higher search costs for mothers hence likely accumulate through their career, and contribute to the persistence of the large penalty they experience in earnings.

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TABLES AND FIGURES

Table 1: Descriptive statistics: Job seekers

	All		Woman		Man	
	Mean	Sd	Mean	Sd	Mean	Sd
Woman	.577	.494	1	0	0	0
Has a child	.528	.499	.6	.49	.43	.495
Age	36.671	8.852	36.547	8.876	36.84	8.818
Single	.51	.5	.496	.5	.529	.499
Education						
Low	.311	.463	.326	.469	.29	.454
Technical	.328	.47	.271	.444	.407	.491
Superior	.361	.48	.403	.49	.303	.46
Experience	7.191	6.88	6.786	6.576	7.743	7.239
Sector						
Sale	.19	.393	.225	.417	.143	.35
Construction	.055	.229	.006	.078	.122	.328
Hospitality	.111	.315	.093	.291	.136	.343
Industry	.05	.217	.028	.165	.079	.27
Care	.153	.36	.198	.398	.092	.289
Business support	.225	.417	.324	.468	.089	.284
Logistic	.082	.275	.018	.134	.17	.376
Preferences						
Full time	.936	.244	.901	.298	.984	.126
Res. Wage	1725.766	515.65	1629.765	440.432	1856.315	578.03
Job search						
Nb. Application (all observed)	3.43	5.97	3.545	5.084	3.273	6.996
Nb. Application (first 6m)	2.375	2.949	2.401	2.881	2.339	3.039
Nb. Application (first 3m)	1.439	2.107	1.451	2.048	1.422	2.186
Find a job in 6m	.182	.386	.171	.376	.197	.398

Notes: In this table, we present the characteristics of unemployed workers in our study sample.

Table 2: Parenthood gap on search selectivity, search intensity and employment, by gender

A/ Women

	Search selectivity				Search intensity	Employment	
	Reservation wage, log (OLS)	Max commute distance, log (OLS)	Open-ened contract (OLS)	Part-time job (OLS)	Applications rate (Poisson)	Re-employment rate (Poisson)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Child	-0.000	-0.069***	0.019***	0.048***	-0.096***	-0.090***	-0.067***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other search criteria	Yes	Yes	Yes	Yes	Yes		Yes
Outcome mean	1614.86	28.68	0.92	0.06	1.25	0.66	0.66
No. of Obs.	221,185	221,185	221,185	221,185	221,185	220,913	220,913

B/ Men

	Search selectivity				Search intensity	Employment	
	Reservation wage, log (OLS)	Max commute distance, log (OLS)	Open-ened contract (OLS)	Part-time job (OLS)	Applications rate (Poisson)	Re-employment rate (Poisson)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Child	0.009***	0.003	0.008***	0.001	-0.007	0.007	0.006
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other search criteria	Yes	Yes	Yes	Yes	Yes		Yes
Outcome mean	1712.06	33.14	0.93	0.02	1.05	0.63	0.63
No. of Obs.	154,209	154,209	154,209	154,209	154,209	154,060	154,060

Notes: This table presents the estimates for the parenthood gap in various outcomes: search selectivity reported in a mandatory survey at the start of the spell (col (1)-(4)), the count of online applications on the PES search platform in the start of the spell (col (5)), and the rate of re-employment within one year (col (6)-(7)). As described in Section 3.3.1, we run separate regressions for men and women and control for job seekers' education (five dummies), experience (five dummies), and age, city, and sector fixed effects. In col (1)-(4), we estimate linear regression models ; in col (5)-(7), we estimate Poisson count models and report the incidence rate ratios minus one, which can be interpreted as semi-elasticities.

Table 3: Parenthood gap on job applications sent at different times, by gender

	A/ Women					
	(1) Hours of day		(2) Days of week		(3) Week of year	
	No-School (a)	School (b)	Weekend (a)	Week (b)	Holidays (a)	School week (b)
Child	-0.220***	0.037**	-0.145***	-0.120***	-0.187***	-0.115***
	(0.011)	(0.016)	(0.024)	(0.009)	(0.017)	(0.010)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Outcome mean	0.473	0.307	0.072	1.182	0.191	0.955
Pval test (a)=(b)		0.000		0.344		0.000
No. of Obs.	221,185	221,185	221,185	221,185	221,185	221,185

	B/ Men					
	(1) Hours of day		(2) Days of week		(3) Week of year	
	No-School (a)	School (b)	Weekend (a)	Week (b)	Holidays (a)	School week (b)
Child	-0.066***	0.075***	0.072*	-0.010	-0.026	0.001
	(0.019)	(0.023)	(0.044)	(0.014)	(0.026)	(0.016)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Outcome mean	0.386	0.267	0.059	0.989	0.170	0.797
Pval test (a)=(b)		0.000		0.072		0.373
No. of Obs.	154,209	154,209	154,209	154,209	154,209	154,209

Notes: This table presents the estimates for the parenthood gap in the rate of applications sent at different times (obtained as described in Section 3.3.2). In (1), we compare the hours of the day corresponding to typical school time vs others (during daytime, weekdays, and non-holidays weeks). In (2), we compare week days to weekend days (during non-holidays weeks). In (3), we compare holidays weeks to school weeks. We run separate regressions for men and women and control for job seekers' education (five dummies), experience (five dummies), and age, city, and sector fixed effects. We estimate Poisson count models and report the incidence rate ratios minus one, which can be interpreted as semi-elasticities.

Table 4: Effect of the reform on search selectivity, search intensity and employment

A/ Women

	Search selectivity				Search intensity	Employment
	Reservation wage, log (OLS)	Max commute distance, log (OLS)	Open-ened contract (OLS)	Part-time job (OLS)	Applications rate (Poisson)	Re-employment rate (Poisson)
	(1)	(2)	(3)	(4)	(5)	(6)
Child	-0.000	-0.072***	0.016***	0.053***	-0.113***	-0.086***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.01)
Reform	0.004***	-0.015***	-0.006***	0.001	-0.043***	0.047***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Child * Reform	-0.000	0.002	0.002	-0.005*	0.040**	0.023***
	(0.00)	(0.01)	(0.00)	(0.00)	(0.02)	(0.01)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Outcome mean	1617.78	28.72	0.93	0.06	0.96	0.65
No. of Obs.	195,538	195,538	195,538	195,538	195,538	195,538

B/ Men

	Reservation wage, log (OLS)	Max commute distance, log (OLS)	Open-ened contract (OLS)	Part-time job (OLS)	Applications rate (Poisson)	Re-employment rate (Poisson)
	(1)	(2)	(3)	(4)	(5)	(6)
Child	0.007***	-0.004	0.004*	-0.002	0.022	-0.008
	(0.00)	(0.01)	(0.00)	(0.00)	(0.02)	(0.01)
Reform	0.007***	-0.016***	-0.003*	-0.002	-0.019	0.061***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.01)
Child * Reform	0.002	0.010	0.004*	0.003	-0.028	0.018*
	(0.00)	(0.01)	(0.00)	(0.00)	(0.02)	(0.01)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Outcome mean	1715.41	33.02	0.94	0.02	0.79	0.62
No. of Obs.	138,024	138,024	138,024	138,024	138,024	138,024

Notes: This table presents the estimates for the effect of the reform of school schedule (adding school time on Wednesday morning) on various outcomes, obtained as described in Section 3.3.3. We present the effect on the selectivity in search reported in a mandatory survey at the start of the spell (col (1)-(4)), the count of online applications on the PES search platform in the start of the spell (col (5)), and the rate of re-employment within one year (col (6)). We run separate regressions for men and women and control for job seekers' education (five dummies), experience (five dummies), and age, city, and sector fixed effects. In col (1)-(4), we estimate linear regression models ; in col (5)-(6), we estimate Poisson count models and report the incidence rate ratios minus one, which can be interpreted as semi-elasticities.
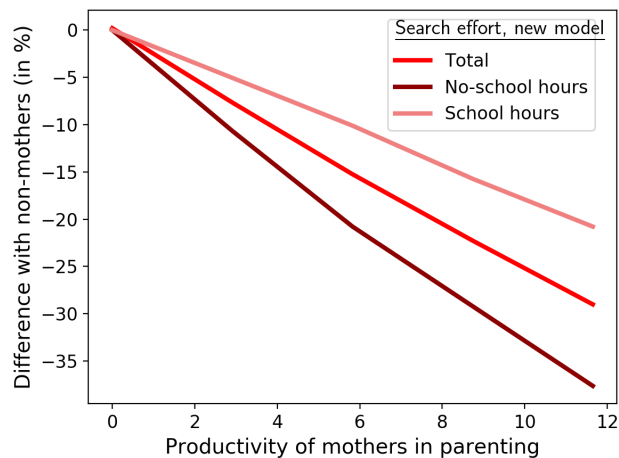
Figure 1: *Predicted gap in job search between women with no children and mothers*

A/Gap in reservation amenity, for different productivity in parenting
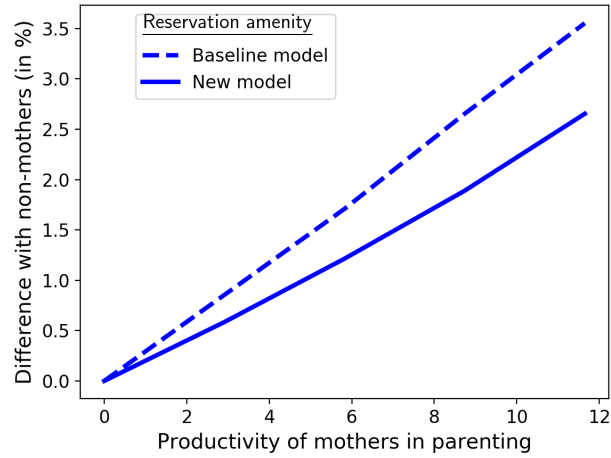
B/Gap in search effort, for different productivity in parenting
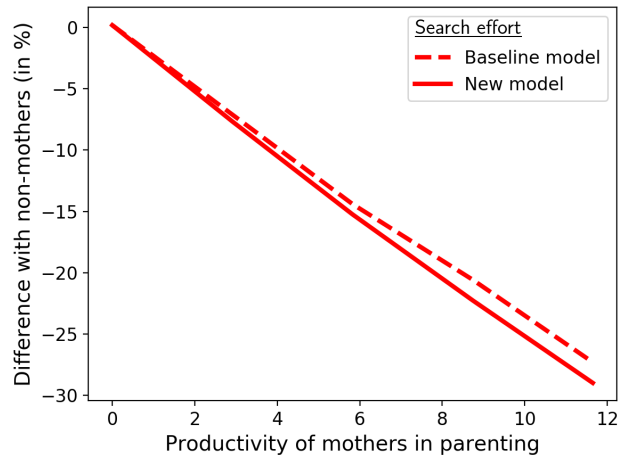
C/Gap in search at different times, for different productivity in parenting

Notes: This Figure illustrates the predictions from the baseline model (doted line) and the extended model (continuous line) presented in Section 2, for different productivity of mothers in parenting. In each panel, we show the productivity of mothers in parenting (x-axis), and the predicted relative effect of motherhood on women's search (y-axis): the relative effect on reservation amenity in Panel A/, on the overall search effort in Panel B/, and search effort in different hours in Panel C/.

Figure 2: *Gap in search and employment associated with parenthood, at different age*

(1) Reservation wage (ln)

(2) Maximum commute distance (ln)

(3) Open-ended contract

(4) Full-time job

(5) Applications rate

(6) Reemployment rate
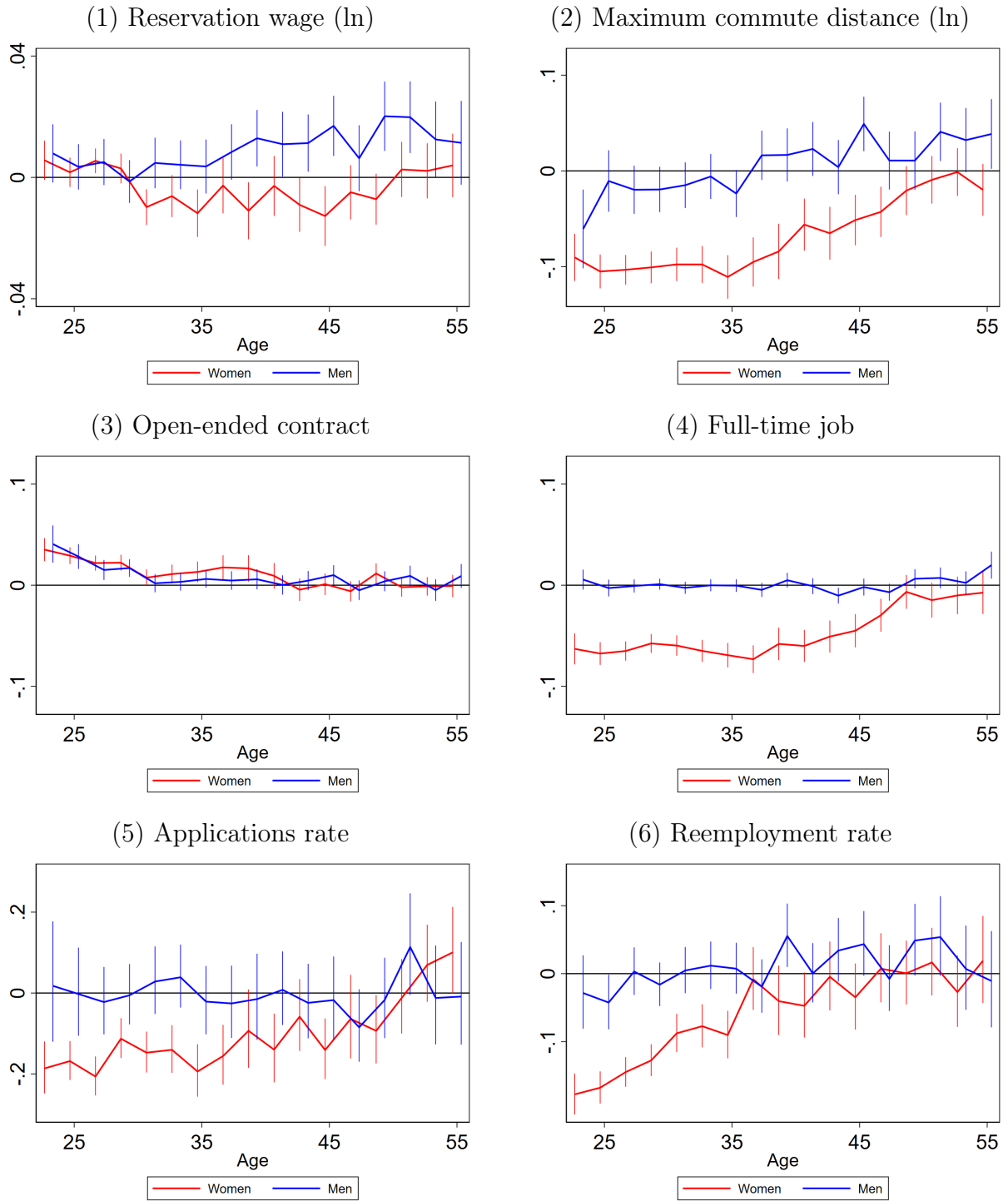
Notes: This Figure presents estimates for the same parenthood gap as in Table 2, but obtained separately for different age groups. We present the gap in search selectivity in Panels (1)-(4), in the count of online applications on the PES search platform in Panel (5), and in the rate of re-employment within one year in Panel (6). As described in Section 3.3.1, we run separate regressions for men and women and control for job seekers' education (five dummies), experience (five dummies), and age, city, and sector fixed effects. In (1)-(4), we estimate linear regression models ; in col (5)-(6), we estimate Poisson count models and report the incidence rate ratios minus one, which can be interpreted as semi-elasticities.

Figure 3: *Parenthood gap in applications at different times of the day, by gender*

A/ Women
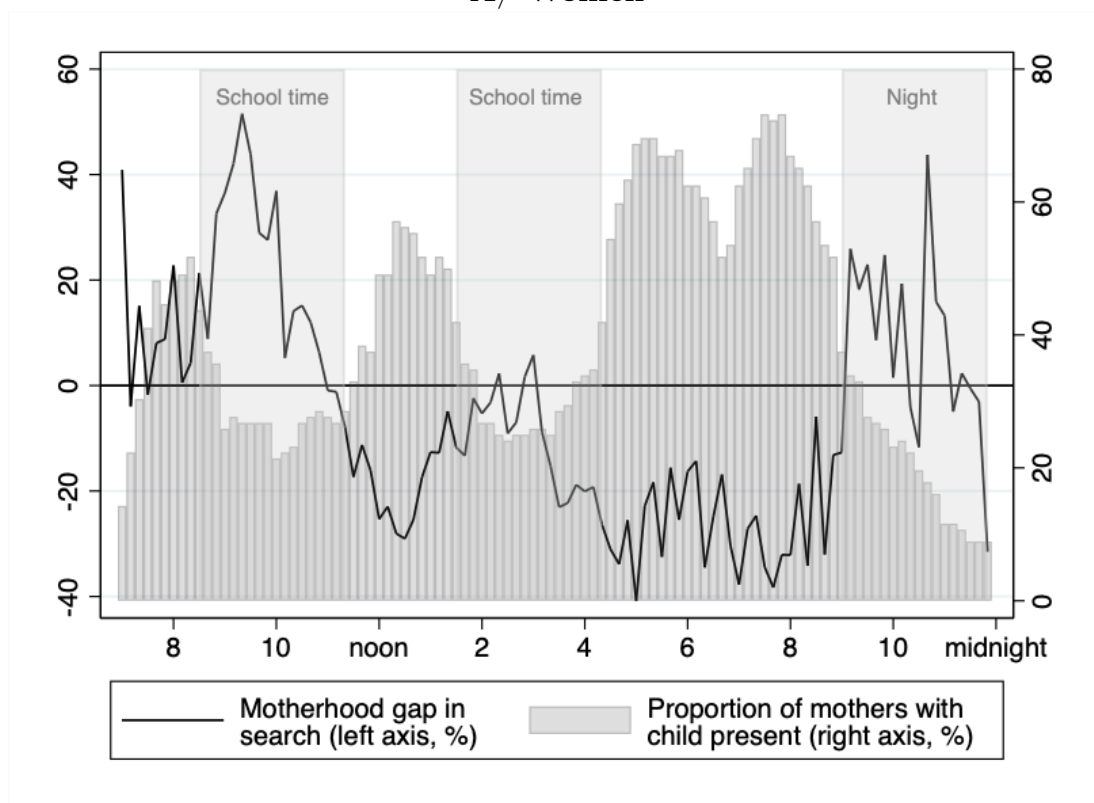
B/ Men
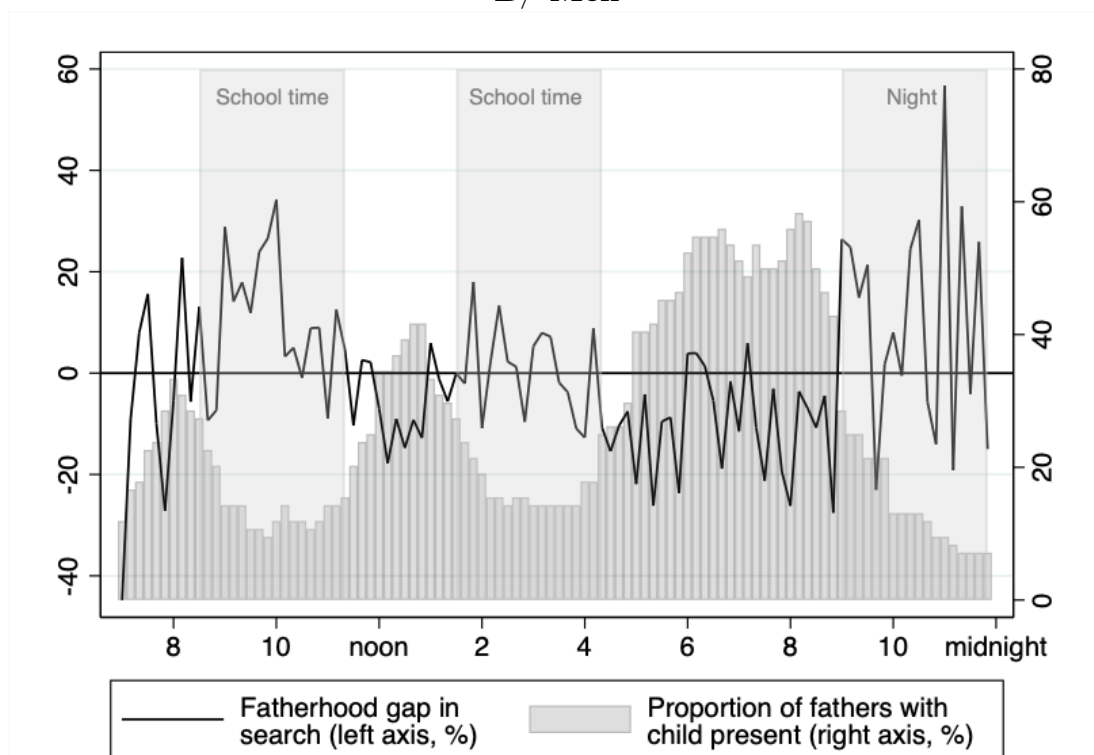
Notes: First, this Figure presents (black line) the estimates for the parenthood gap in the rate of applications sent in 10-minutes intervals throughout the day (in %). As described in Section 3.3.2, we run separate regressions for men and women and control for job seekers' education (five dummies), experience (five dummies), and age, city, and sector fixed effects. We estimate Poisson count models and report 100 times the incidence rate ratios minus one. Second, this Figure presents (gray bars) the fraction of unemployed parents who report being in presence of at least one child during the same 10-minutes intervals (in %), in the French Time Use Survey.

Figure 4: *Effect of the school schedule reform on parents' application, by day and gender*

A/ Women

B/ Men
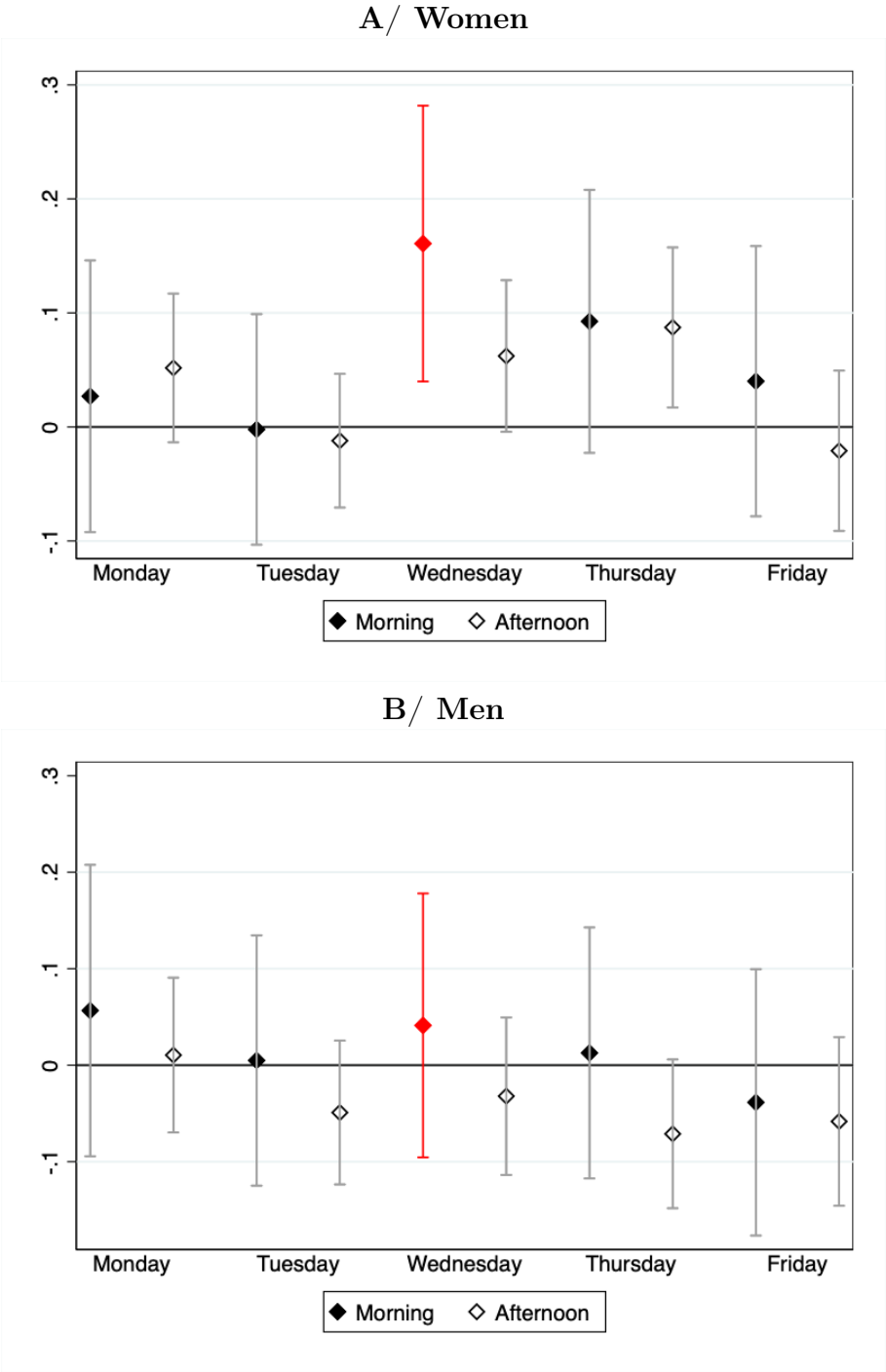
Notes: This table presents the estimates for the effect of the reform of school schedule (i.e. adding school time on Wednesday morning) on various outcomes the rate of applications sent on different days of the week. We estimate the model described in Section 3.3.3 (like in Table 4), and report the coefficients associated with $Child * Reform$. We estimate Poisson count models and report the incidence rate ratios minus one, which can be interpreted as semi-elasticities.

ONLINE APPENDIX

A Additional descriptive statistics

A.1 Representativeness of the search platform

Table A.1: Descriptive statistics: Vacancies

var	Mean	Sd
Weekly hours	31.719	7.188
Wage indicated	.461	.498
Wage (when indicated)	1598.999	466.081
Education requested		
None	.008	.087
High school	.141	.348
Technical	.182	.386
Experience requested	1.374	1.659
Sector		
Sale	.197	.398
Construction	.043	.203
Hospitality	.147	.354
Industry	.047	.211
Care	.177	.382
Buisness support	.174	.379
Logistic	.076	.265
Nb. application from main sample	2.258	1.864
Application filled		
Woman with children	.019	.136
Woman without children	.011	.105
Man with children	.008	.091
Man without children	.011	.104
N	447,790	

A.2 Timing of online applications

There is almost no search activity before 7 am and more than 75% of the applications are sent between 9 am and 6 pm. Job search peaks in the middle of the morning (around 10 am),

decreases for lunch (around 1 pm), re-increases at the beginning of the afternoon (between 2 pm and 4 pm), and rapidly decreases at the end of the afternoon and in the evening. While parents and non-parents follow a relatively similar pattern, they particularly differ at certain moments. Unsurprisingly, parents start sending applications earlier. Their decrease in search activities at lunchtime and at the end of the afternoon is more pronounced. Last, parents display a small increase in job searches in the evening.

Figure A.1: *Within day evolution of parents' and non parents' applications*

A/ Absolute terms

B/ Proportion
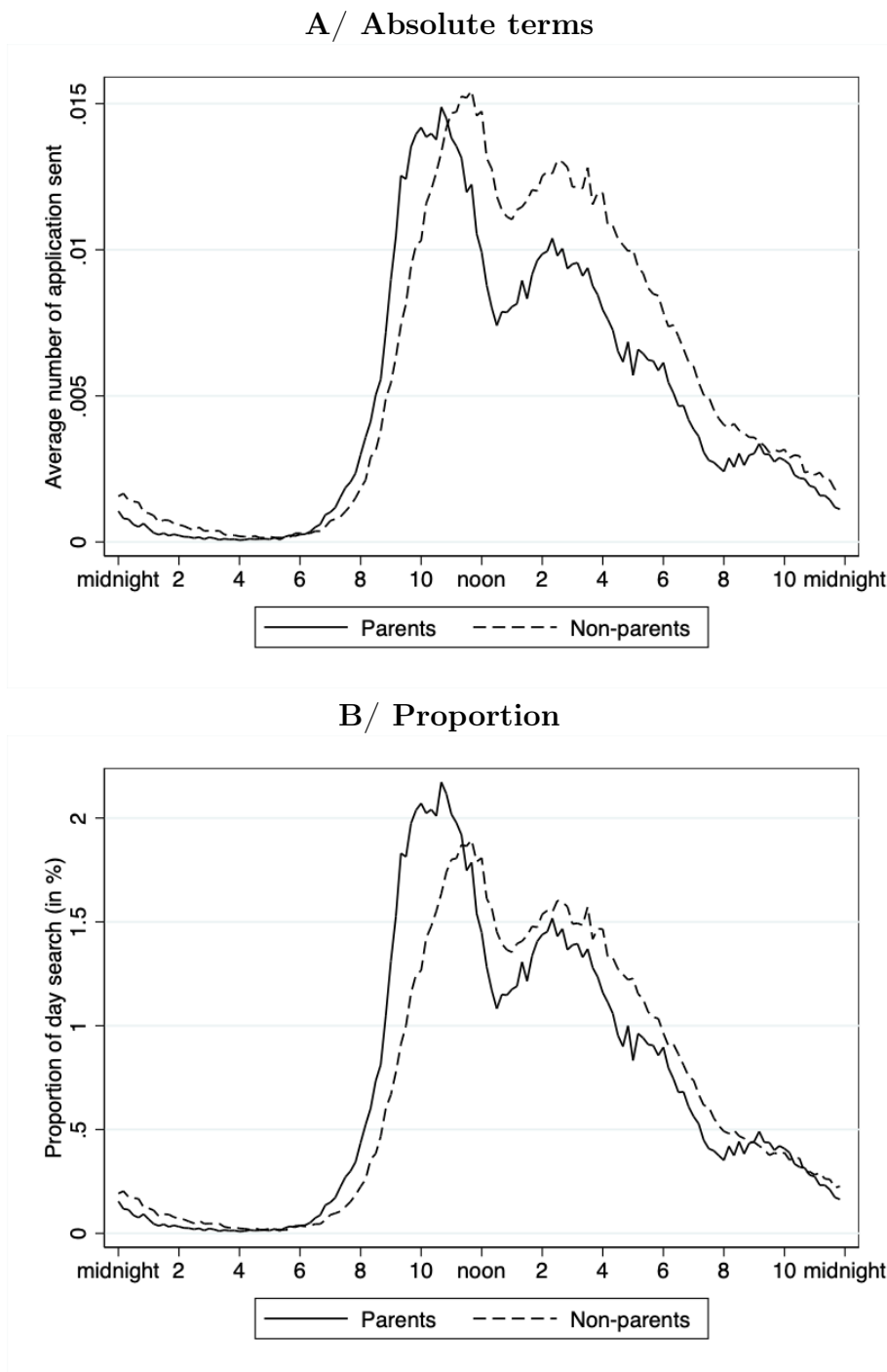
B Additional results and robustness checks

B.1 The motherhood gap in search

Table B.1: Robustness check: Parenthood gap on search selectivity, search intensity and employment, by gender

	A/ Women					
	Search selectivity				**Search intensity**	**Employment**
	Reservation wage, log (OLS)	Max commute distance, log (OLS)	Open-ened contract (OLS)	Part-time job (OLS)	Applications rate (Poisson)	Re-employment rate (Poisson)
	(1)	(2)	(3)	(4)	(5)	(6)
Child	-0.002**	-0.076***	0.014***	0.051***	-0.129***	-0.090***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Other search criteria						
Outcome mean	1614.86	28.68	0.92	0.06	1.25	0.66
No. of Obs.	221,185	221,185	221,185	221,185	221,185	220,913

	B/ Men					
	Search selectivity				**Search intensity**	**Employment**
	Reservation wage, log (OLS)	Max commute distance, log (OLS)	Open-ened contract (OLS)	Part-time job (OLS)	Applications rate (Poisson)	Re-employment rate (Poisson)
	(1)	(2)	(3)	(4)	(5)	(6)
Child	0.009***	0.004	0.008***	-0.000	-0.006	0.007
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Other search criteria						
Outcome mean	1712.06	33.14	0.93	0.02	1.05	0.63
No. of Obs.	154,209	154,209	154,209	154,209	154,209	154,060

Notes: In this table, we analyze differences in search and re-employment outcomes between unemployed parents and non-parent using Equation 1. We present the estimates from the same regressions as in Table 2 except that we don't control for other search criteria.

Table B.2: *Parenthood gap in search selectivity, using survey or job application data*

A/ Women: Survey answers

	Reservation wage, log		Max commute distance, log		Long contract		Part time	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Child	-0.00	-0.00	-0.07***	-0.07***	0.01***	0.02***	0.04***	0.03***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other search criteria		Yes		Yes		Yes		Yes
Outcome mean	1641.00	1641.00	27.45	27.45	0.94	0.94	0.08	0.08
No. of Obs.	67,891	67,891	107,841	107,841	115,690	115,690	115,690	115,690

B/ Women: Applications

	Wage, log		Commute distance, log		Long contract		Part time	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Child	0.00**	0.00**	-0.11***	-0.11***	0.01***	0.01***	0.03***	0.03***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other search criteria		Yes		Yes		Yes		Yes
Outcome mean	1641.50	1641.50	26.52	26.52	0.42	0.42	0.24	0.24
No. of Obs.	67,891	67,891	107,841	107,841	115,690	115,690	115,690	115,690

C/ Men: Survey answers

	Reservation wage, log		Max commute distance, log		Long contract		Part time	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Child	0.01***	0.01***	0.00	0.00	0.01***	0.01***	-0.00	-0.00
	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other search criteria		Yes		Yes		Yes		Yes
Outcome mean	1795.16	1795.16	34.25	34.25	0.95	0.95	0.02	0.02
No. of Obs.	47,323	47,323	68,423	68,423	78,212	78,212	78,212	78,212

D/ Men: Applications

	Wage, log		Commute distance, log		Long contract		Part time	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Child	0.00	0.00	-0.03**	-0.03**	0.01*	0.01*	-0.00	0.00
	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other search criteria		Yes		Yes		Yes		Yes
Outcome mean	1678.73	1678.73	29.86	29.86	0.50	0.50	0.11	0.11
No. of Obs.	47,323	47,323	68,423	68,423	78,212	78,212	78,212	78,212

Table B.3: *Effect of parenthood on speed of job applications*

	Women			
	Duration vacancy (log)		Duration $\leq$ 1 day	
	(1)	(2)	(3)	(4)
Child	0.004	0.029**	-0.003	-0.012**
	(0.010)	(0.012)	(0.003)	(0.005)
Individual characteristics	Yes	Yes	Yes	Yes
Vacancy FE		Yes		Yes
Outcome mean (non logged)	11.755	11.755	0.393	0.393
No. of Obs.	240,051	240,051	240,051	240,051

	Men			
	Duration vacancy (log)		Duration $\leq$ 1 day	
	(1)	(2)	(3)	(4)
Child	-0.041***	-0.042**	0.007*	0.012
	(0.012)	(0.020)	(0.004)	(0.008)
Individual characteristics	Yes	Yes	Yes	Yes
Vacancy FE		Yes		Yes
Outcome mean (non logged)	16.447	16.447	0.324	0.324
No. of Obs.	160,788	160,788	160,788	160,788

Table B.4: Child Gap in the Time Use among unemployed workers (French Time Use Survey)

	Women							
	Job search		Work		Housework		Childcare	
Mean	7.66		19.144		221.205		63.462	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Child< 3yo	-7.003**		-17.288**		17.133		145.590***	
	(2.891)		(7.590)		(21.414)		(25.272)	
Child		-6.280		-27.032***		63.041***		90.070***
		(4.711)		(10.163)		(17.145)		(9.886)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	495	495	495	495	495	495	495	495

	Men							
	Job search		Work		Housework		Childcare	
Mean	36.11		42.41		133.525		19.752	
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Child< 3yo	16.612		-22.676		-9.172		99.156***	
	(26.528)		(18.022)		(28.792)		(28.870)	
Child		-1.621		9.728		3.949		38.104***
		(13.734)		(19.102)		(19.919)		(6.921)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	469	469	469	469	469	469	469	469

Notes: This Table presents the differences in time spent on various activities (in minutes) associated with parenthood, estimated on the sample of unemployed individuals between age 20-50 (note that we include answers given during weekends). We report the mean outcomes for women and men, separately. The estimates are obtained in OLS regression using survey weights. Child< 3yo is a dummy variable indicating that the individual has at least one child below 3 years old, and Child is a dummy variable indicating that the individual had at least one child. We include a wide range of control variables: individuals' age categories, broad education categories, broad sector categories (primary, secondary, tertiary), and a dummy for whether the person answered on a week day. Robust SE in parentheses.

Table B.5: Parenthood gap in re-employment outcomes after job loss, by gender

	Women						Men					
Sample:	Study Sample		FH-DADS Sample				Study Sample		FH-DADS Sample			
Model:	Poisson	Poisson	Poisson	Poisson	OLS	OLS	Poisson	Poisson	Poisson	Poisson	OLS	OLS
Outcome:	Finds job within 1 year	Finds stable job within 1 year	Finds job within 1 year	Finds stable job within 1 year	ln(wage) at first job	ln(wage) at first stable job	Finds job within 1 year	Finds stable job within 1 year	Finds job within 1 year	Finds stable job within 1 year	ln(wage) at first job	ln(wage) at first stable job
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Child	-0.096***	-0.072***	-0.085***	-0.083***	-0.013***	-0.014***	0.024***	0.100***	0.011	0.005	0.005	0.004
	(0.005)	(0.011)	(0.009)	(0.011)	(0.003)	(0.003)	(0.003)	(0.014)	(0.009)	(0.014)	(0.003)	(0.004)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	201,809	178,959	57,422	55,689	47,172	41,662	140,849	126,354	59,949	56,838	49,775	40,605

Notes: This Table presents the differences in re-employment associated with parenthood, estimated on the sample of individuals who lost their job involuntarily at age 20 to 45. We present three types of hazards: the hazard of finding any job, the hazard of finding a stable job, and the hazard of leaving the unemployment register. Child is a dummy variable indicating that the individual had at least one child when she became unemployed. We include a wide range of control variables: individuals' age, education level, skill level, previous work experience, prior time spent unemployed, prior wage, potential benefits duration. Robust SE in parentheses.

B.2 High-frequency trade-off between job search and childcare

Figure B.1: *Parenthood gap in applications at different times of the day, by gender. Comparison with childcare instead of child presence*
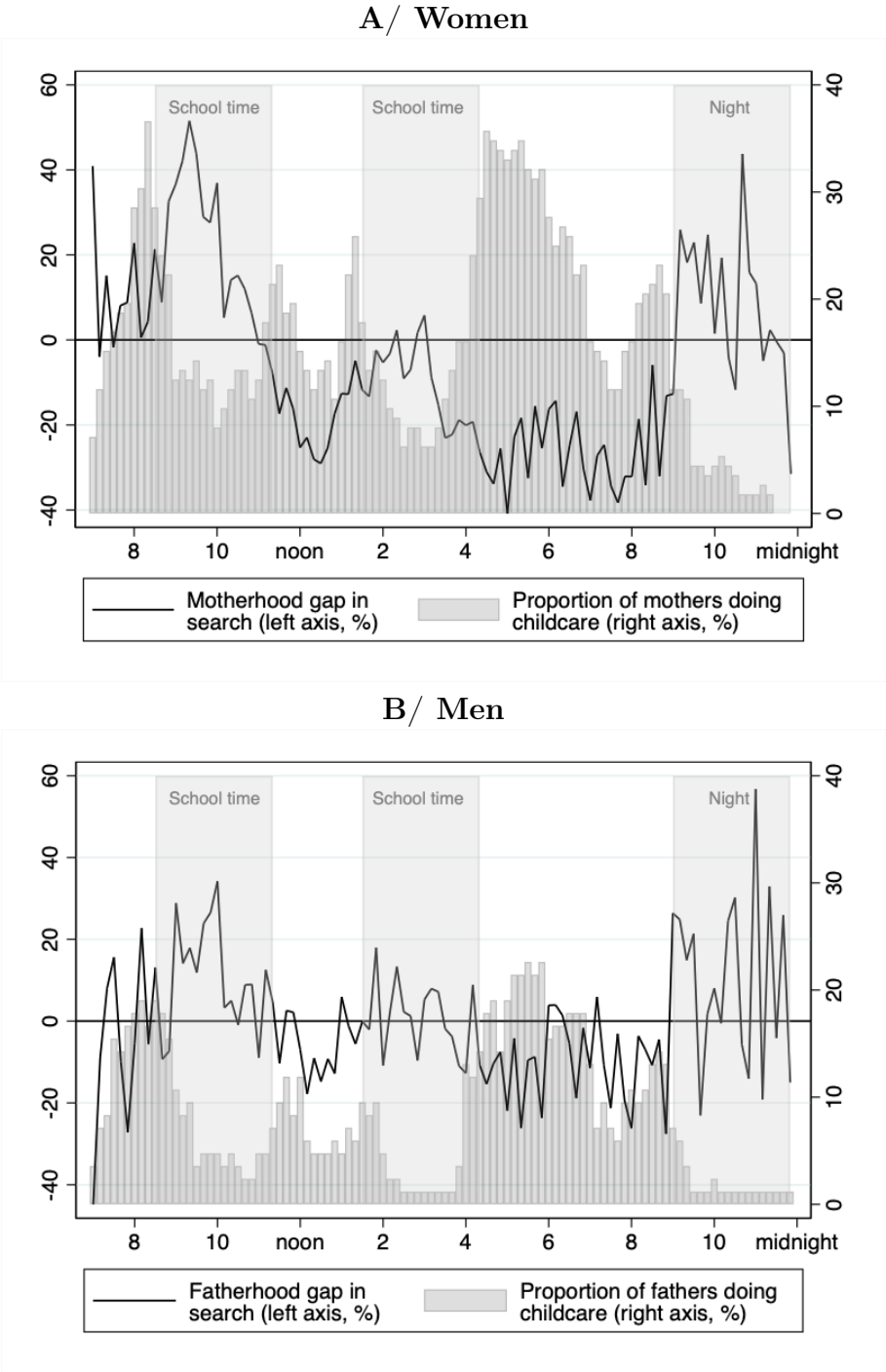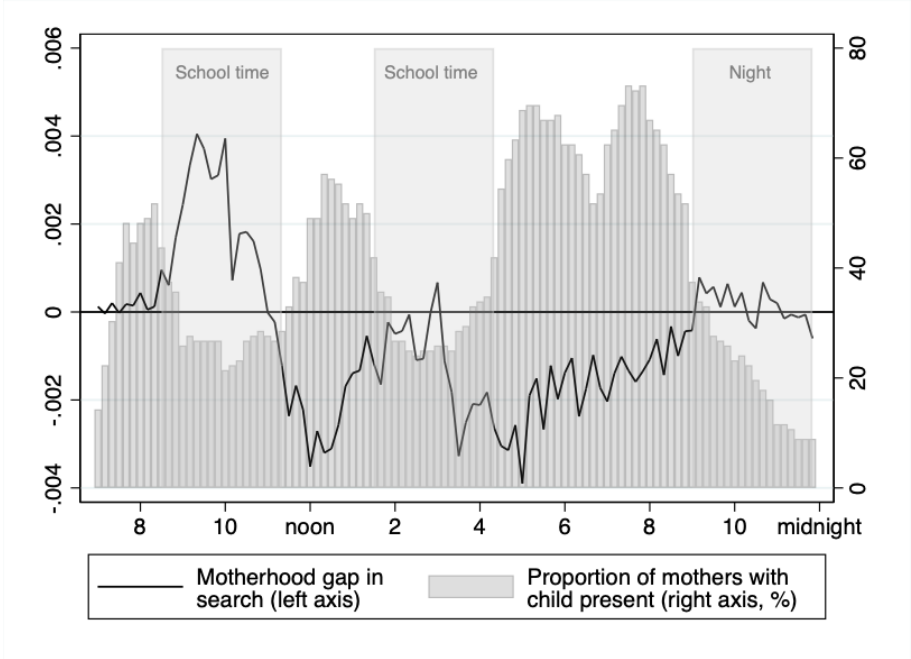
A/ Women

B/ Men

Figure B.2: *Parenthood gap in applications at different times of the day, by gender. Results using OLS instead of poisson regressions*

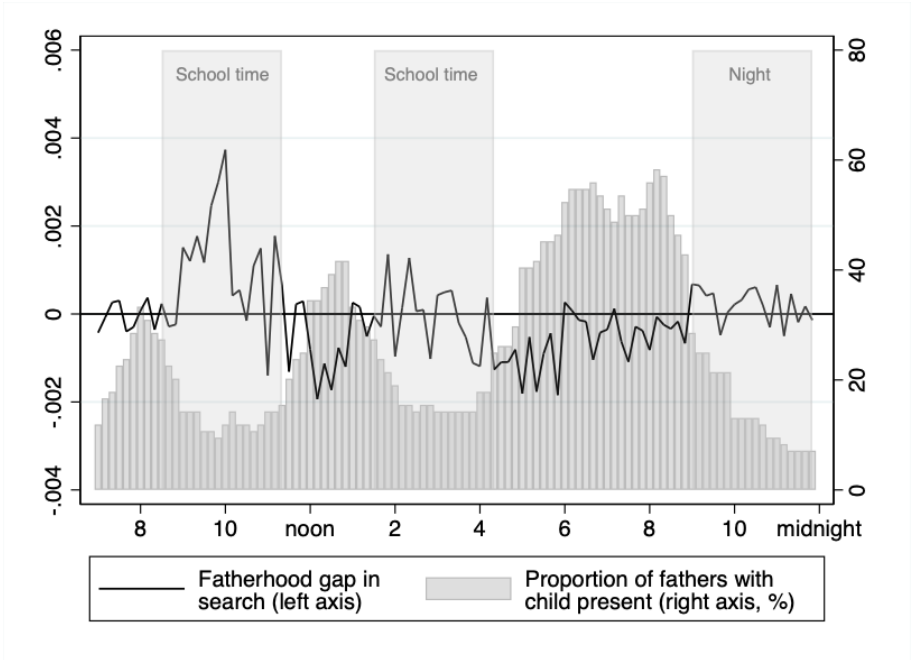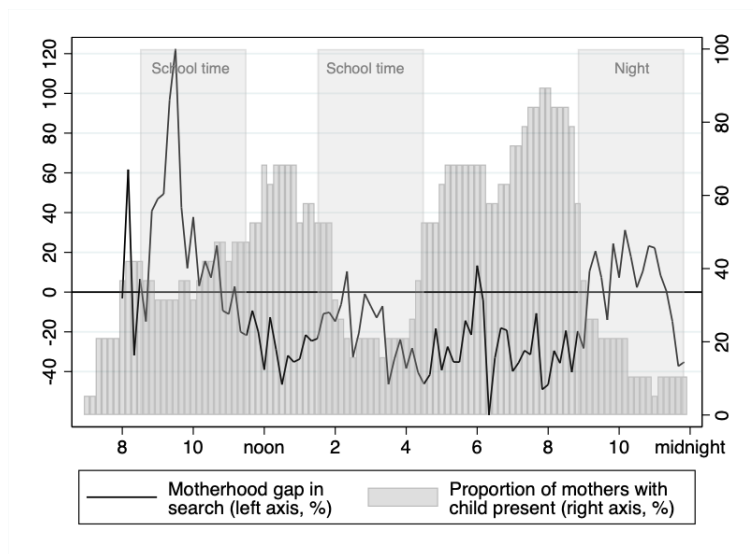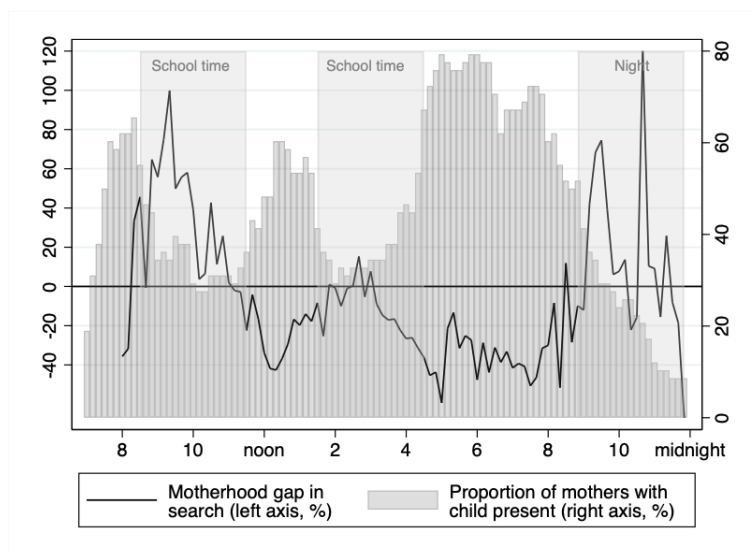**A/ Women**

B/ Men

Figure B.3: *Motherhood gap in applications at different times of the day, heterogeneity*

(a) 20-27 years old

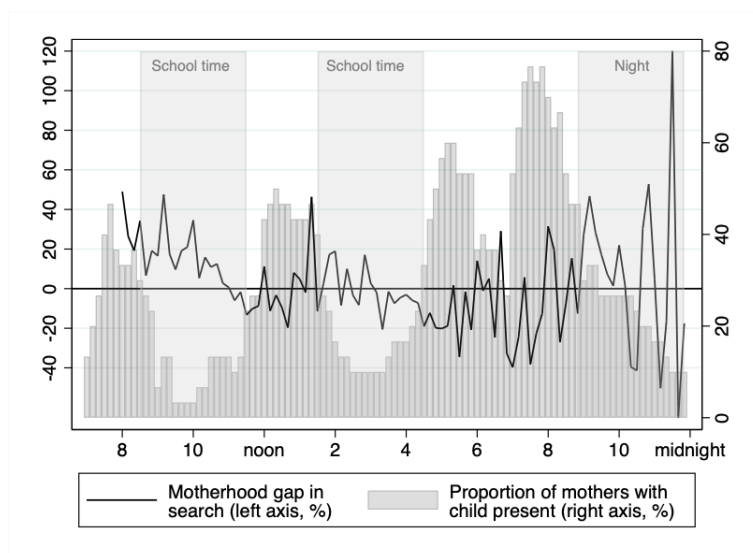(b) 28-38 years old

(c) 39-55 years old

Table B.6: *Correlation between job search, child presence and childcare per gender and period of the day*

| | (1) | (2) | (3) | (4) |
	Child gap - Women		Child gap - Men	
Child presence - Mothers	-0.765***			
	(0.096)			
Childcare - Mothers		-0.865***		
		(0.217)		
Child presence - Fathers			-0.433***	
			(0.096)	
Childcare - Fathers				-0.765***
				(0.237)
Constant	0.252***	0.112***	0.085**	0.061**

Figure B.4: *Parenthood gap in applications at different times of the day, by gender. Results using OLS instead of poisson regressions*
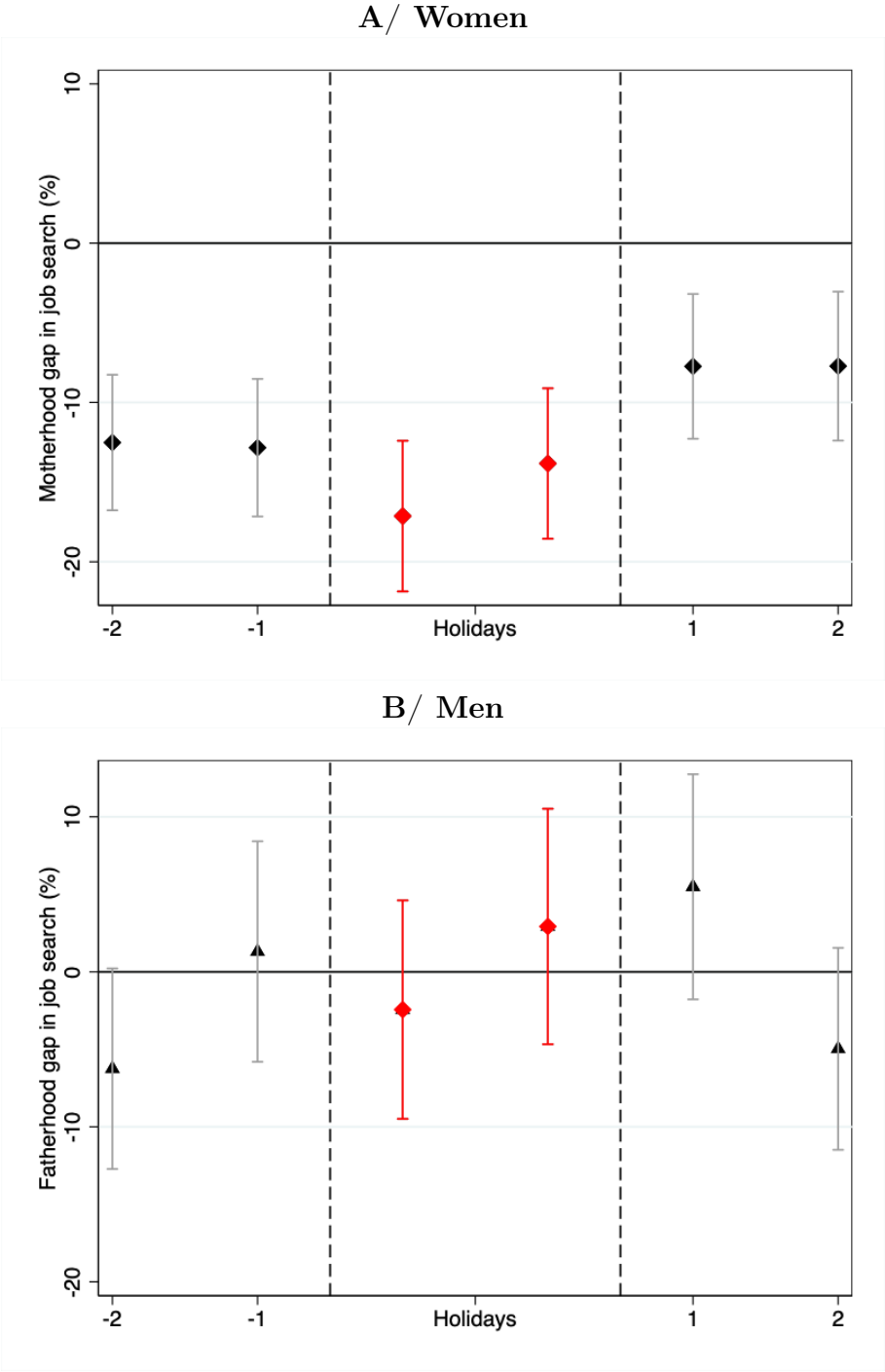
A/ Women

B/ Men

Table B.7: *Correlation between job search, child presence and childcare per gender and period of the day*

	(1)	(2)	(3)	(4)
	Women		Men	
School holidays	-0.112***	-0.0555***	-0.0899***	-0.0426**
	(0.00907)	(0.0156)	(0.0105)	(0.0177)
School holidays *Child	-0.0635***	-0.0586***	-0.0206	-0.0106
	(0.0142)	(0.0144)	(0.0188)	(0.0190)
Summer holidays	-0.204***	0	-0.217***	0
	(0.0156)	0	(0.0187)	0
Summer holidays *Child	-0.0979***	-0.0957***	-0.0683*	-0.0683*
	(0.0243)	(0.0247)	(0.0349)	(0.0356)
Week-end	-0.703***	0	-0.716***	0
	(0.00372)	0	(0.00411)	0
Week-end*Child	-0.0973***	-0.0912***	0.0351	0.0415*
	(0.0161)	(0.0163)	(0.0238)	(0.0239)
Legal holiday	-0.596***	0	-0.596***	0
	(0.0132)	0	(0.0141)	0
Legal holiday *Child	-0.178***	-0.167***	0.0915	0.0941
	(0.0406)	(0.0416)	(0.0635)	(0.0640)
Individual fe	Yes	Yes	Yes	Yes
Vacancies per day and county (13 var)	Yes	Yes	Yes	Yes
Day of the spell fe		Yes		Yes
Calendar day fe		Yes		Yes
Observations	9,763,099	9,692,637	6,778,016	6,729,253

B.3   The effect of the reform of school schedule

Table B.8: Effect of the reform on search intensity per day and employment, by gender

A/ Women

	Monday	Tuesday	Wednesday	Thursday	Friday	Employment Cox Duration Model
	(1)	(2)	(3)	(4)	(5)	(6)
Child	-0.149***	-0.065**	-0.178***	-0.081***	-0.083**	-0.147***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.0121)
Reform	-0.063***	-0.024	-0.059***	-0.018	-0.043*	0.0632***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.00937)
Child * Reform	0.053*	-0.003	0.074**	0.095***	-0.021	0.0302**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.0133)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Outcome mean	0.18	0.20	0.19	0.17	0.13	
No. of Obs.	195,538	195,538	195,538	195,538	195,538	195,538

B/ Men

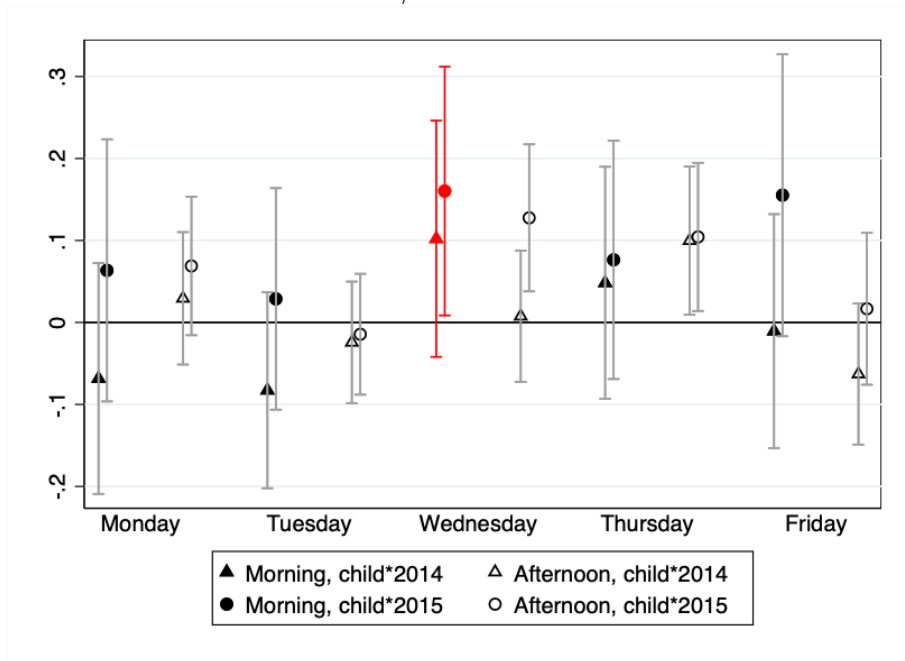|	Monday	Tuesday	Wednesday	Thursday	Friday	Employment Cox Duration Model
Child	0.007	0.037	-0.038	0.018	0.064	-0.00413
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.0150)
Reform	-0.041	-0.028	-0.023	0.017	-0.008	0.0895***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.00990)
Child * Reform	0.031	-0.057	-0.023	-0.034	-0.086*	0.0190
	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.0160)
controls	Yes	Yes	Yes	Yes	Yes	Yes
Outcome mean	0.15	0.16	0.16	0.15	0.11	
No. of Obs.	138,024	138,024	138,024	138,024	138,024	138,024

Table B.9: Effect of the reform on search intensity on Wednesday, by gender and date of the implementation of the reform.

	Women		Men	
	Treat	Placebo	Treat	Placebo
	(1)	(2)	(3)	(4)
Child	-0.153***	-0.119**	-0.025	-0.125*
	(0.026)	(0.047)	(0.040)	(0.061)
After 2014	-0.057***	-0.030	-0.023	-0.087**
	(0.021)	(0.039)	(0.026)	(0.041)
Child* After 2014	0.074**	-0.013	-0.023	0.064
	(0.037)	(0.061)	(0.045)	(0.084)
Controls	Yes	Yes	Yes	Yes
Outcome mean	0.142	0.148	0.146	0.149
No. of Obs.	150701	44837	105810	32214

Note: *Treat* refers to cities were the reform was implemented in September 2014. *Placebo* refers to cities were the reform was implemented in September 2013 (i.e. before the beginning of the obsevation period)

Figure B.5: *Effect of the school schedule reform on parents' application, by day and gender*

A/ Women

B/ Men

Tables_Figures/reforme_appendix_men_2014_2015.png