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DISCUSSION PAPER SERIES

IZA DP No. 15205

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ABSTRACT

The Value of Leisure Synchronization

This paper explores the extent to which workers are willing to trade hours worked for leisure time shared with their spouse. This parameter is essential to properly assess contemporary trends in the regulation of work and leisure time. We use the fact that the number and timing of paid vacation days to which French employees are entitled vary in a quasi-random way, from year to year, along with the dates of public holidays. Self-employed workers do not benefit from public holidays but we show that a large fraction of them substitute a day of unpaid leisure for a day of paid work whenever their spouse gets an extra day of paid leave.

JEL Classification: J22, D13
Keywords: leisure, synchronization, public holidays

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1. Introduction

Leisure complementarities between spouses have long been identified as a potentially very important determinant of family labour supply (Ashenfelter and Heckman, 1974). They also represent a key policy parameter as they provide a channel through which reforms changing the working time or working schedules of a small fraction of workers can affect a much larger proportion of the population. Leisure complementarities between spouses also represent a potentially important factor of marital quality and stability and may be associated with improvement in a wide range of outcomes, from better health status to better child development. While leisure complementarities have deep economic and social implications, it is very difficult to assess their true importance. Such an assessment requires observing independent variation not only in the amount of leisure enjoyed by spouses, but also in the timing of their leisure time. As Daniel Hamermesh put it twenty years ago "*Simply examining how the total of one spouse's hours affects the other's is not informative about their decisions on supplying labor as affected by what is presumably their desire to be together*" (Hamermesh, 2002). Furthermore, for variations in the amount and timing of one spouse's work hours to identify cross-hour effects (rather than cross-income effects), they must be uncorrelated with that spouse's income. In this paper, we take advantage of the features of paid leave and public holidays in France to overcome these difficulties and re-evaluate the influence that spouses actually exert on each other's work and leisure time. We highlight much larger cross-hour effects than those usually identified in the literature.

In France, employees (but not self-employed workers) are granted paid days off for eleven public holidays. Eight of these days fall on the same date every year, but not necessarily on a workday. For instance, All Saints Day (November 1) fell on a Friday in 2013, but on a Sunday in 2015. The three other days fall on the same workday every year, but not necessarily on the

same date of the year. For example, Easter Monday fell at the end of April in 2014, but at the end of March in 2016. As a result, the timing and overall number of days off employees get from public holidays varies year-on-year according to predetermined rules that are completely exogenous to the potential determinants of labor supply. When, from one year to the next, an additional public holiday falls on a workday, it increases the number of days off for employees at that time of year, without affecting their income or their number of days off at other times of the year. Using the French Labor Force surveys (LFS) conducted between 2013 and 2017, we show that self-employed workers who live with employees are much more likely to stop working on that day than self-employed workers who live with another self-employed worker. We also show that it does not lead them to work more at other times of the year, consistent with the idea that their response does not simply reflect intertemporal substitution effects. Ultimately, when their spouse gets an extra day off, about 50-60% of self-employed workers living with employees take an additional day off work on the same day, namely substitute a day of joint leisure for a workday. For large fractions of self-employed workers, the marginal rate of substitution of one day of joint leisure for one day of paid work appears to be larger than their daily income.

The cross-effects on the number of days off work are highly significant, but heterogenous. Specifically, they tend to be stronger for women than for men in families without children, but are about twice as low for women in families with children. This result is consistent with the idea that children tend to reduce the value of non-market time shared with family for women, but to increase it for men.

To test the robustness of our results, we check that estimated cross-effects on work-leisure decisions disappear after their spouses' retirement. We also use the fact that some collective agreements authorize work on public holidays in the hotel, restaurant or food trade industries as well as in public services that cannot interrupt their activity (e.g., hospital or police). The

LFS data confirm that the proportion of employees who take time off work on public holidays is on average much higher outside these specific industries than within these industries. The same data reveal that self-employed workers who live with employees who work outside these specific industries are themselves much more likely to take days off on public holidays than self-employed workers who live with employees who work in these industries. This alternative identification strategy suggests that, when their spouse benefits from an additional day of paid leave, about 40% of self-employed workers living with employees in non-derogatory industries take an additional day off on the same day. Estimated cross-effects are again much weaker for women in families with children.

Our paper contributes to the literature that seeks to measure and explain leisure synchronization within couples.[1] This literature has long emphasized that spouses' work schedules are more synchronized than would occur randomly. However, it is still unclear whether this synchronization reflects spouses' desire to spend time together rather than the fact that they tend to have similar time constraints. By focusing on workers' response to independent changes in the amount and timing of leisure enjoyed by their spouse, we are able to identify the extent to which workers are willing to trade hours worked for leisure time shared with their spouse. This parameter is essential to properly assess contemporary trends in the regulation of work and leisure time. Weekend work and non-standard working hours (evening, night or early morning) are pervasive in many developed countries, even though a large majority of workers report that these non-standard arrangements make it very difficult to reconcile family and work life (Taiji and Mills, 2020). Our results highlight that a comprehensive evaluation of policies that give employers more flexibility to set employees' working hours and days should take account of the specific value that individuals place on the synchronization of their schedules.

[1] See e.g., Hamermesh, (2002) Hallberg (2003); Jenkins and Osberg (2005); van Klaveren and van den Brink (2007); Connelly and Kimmel (2009); Voorpostel et al. (2010); Bredtmann (2014); Qi et al. (2017).

More generally, our paper contributes to the long-standing literature on the interdependence of spouses' decisions within couples. There is a vast body of research that explores how workers' labor supply responds to changes in their spouses' work hours or earnings, whether at the time of their spouse's retirement, during unemployment spells or after a tax reform (e.g., Lundberg, 1988, Bingley and Lanot 2007, Gelber, 2014, Lalive and Parotta, 2017, Vedeler-Johnsen et al., 2021). These contributions provide estimates of cross-effects that are often relatively modest, but that do not necessarily reflect leisure complementarities, if only because they generally capture both cross-income and cross-hour effects. A related strand of the literature focuses on reforms that lead to an income-neutral reduction in the length of the legal workweek and this approach makes it possible to better identify cross-hour effects (Hunt, 1998, Hamermesh et al. 2017, Goux et al. 2014). By exploiting independent variation affecting not only in the amount of time worked, but also the timing of work and leisure, we extend this literature and isolate the key role played by the desire to synchronize non-market time.

From their analysis of the cross-effects of the 35-hour workweek reform on French employees, Goux et al. (2014) conclude that a 10% reduction in the length of the workweek for a wife leads to a 2.5% reduction in the length of her husband's workweek (mainly through the reduction of unpaid overtime), whereas a 10% reduction in the length of the workweek for a husband has no significant effect on his wife. From their analysis of the cross-effects of Japanese and Korean reforms, Hamermesh et al. (2017) find even smaller cross-effects. Our results suggest that these earlier findings may reflect employees having little leeway to adapt the length of their workweek, at least in the short run (e.g., Altonji and Paxson, 1988, Dickens and Lundberg, 1993, Chetty et al., 2011). Focusing on self-employed workers (and, consequently, much more elastic margins), we identify much larger cross-effects and highlight large gender differences in the willingness to synchronize one's leisure time with that of one's spouse. Our findings help to reconcile the literature exploring the magnitude of cross-effects on work and leisure time

with the literature showing that leisure synchronization is both pervasive and associated with higher levels of well-being.[2]

The rest of this paper is organized as follows. Section 2 describes the French regulations pertaining to public holidays. Section 3 presents a conceptual framework for our empirical analysis and section 4 describes the data used. Section 5 outlines our main findings and section 6 concludes.

2. Institutional context

In France, employment contracts specify the number of days of paid leave that each employee must take during the year, and this number cannot be less than 25 workdays. In addition to these days of paid leave, French employees can also benefit from a total of up to 11 public holidays in the year.[3] Eight of these public holidays occur on a specific date of the year, but on a day of the week that changes from year to year : New Year's Day (January 1st), Labour Day (May 1st), Victory in Europe Day (May 8th), Bastille Day (July 14th), Day of the Assumption of Mary (August 15th), All Saint's Day (November 1st), Armistice Day (November 11th), and Christmas (December 25th). The other three public holidays take place on specific days of the week, but on dates which vary from year to year: Easter Monday (which date is set according to the *computus)*, Ascension Thursday (38 days after Easter Monday), and Pentecost Monday (49 days after Easter Monday). Figure 1 describes how the different public holidays are distributed across months and weeks of the year, for the period 2013-2017. [4]

[2] See e.g. Kingston and Nock (1987), Hill (1988), Sullivan (1996), Flood and Genadek (2016), Hamermesh (2020).

[3] In three administrative districts in eastern France (Moselle, Bas Rhin, Haut Rhin), the total is even 13 holidays, since Good Friday and the Boxing Day are added to the first 11. This is a legacy of the German occupation between 1870 and 1918.

[4]In the US there are ten federal holidays, but they are moved to the nearest workday whenever they fall on a weekend.

In most industries, collective agreements are such that these public holidays entitle employees to additional days of paid leave as long as they do not fall on a weekend.[5] Figure 2 confirms that when a public holiday falls on a weekday (i.e., excluding Saturday and Sunday) about 80% of employees do not work, compared to only 20-25% when the same weekday is not a public holiday. However, public holidays do not necessarily fall outside of a weekend. Figure 3 focuses on the eight public holidays that do not fall on a specific day of the week and shows their distribution across the different days of the week for the period 2013-2017. It reveals that they fell on a weekend in about 22% of cases (22%=9/40), a little less than if the distribution had been uniform (i.e., 28%=2/7). In fact, the figure confirms that – over this 2013-2017 period - each of these eight public holidays falls at most once on each of the five weekdays and at most twice on weekends, reflecting the continual changes in the days of the week on which each of them falls. Finally, it should be emphasized that the law and collective agreements only apply to employees: self-employed workers are free to work whenever they want.

In this institutional setting, from one year to the next, at almost any time of the year, an employee may or may not benefit from an additional day of paid leave on the one hand, and on the other hand, in a largely independent manner, may be more or less close to periods where he or she has benefited from additional days of paid leave. If we consider, for example, All Saints Day (November 1), it corresponds to an additional paid day off in 2013, 2016 and 2017, but not in 2014 or 2015. In 2016, it is a paid day off but no other (non-weekend) public holiday falls nearby, while in 2017, it is again a paid day off and another non-weekend public holiday falls nearby (on November 11).[6]

[5] To be specific, the labor code requires that that when work does stop for a public holiday, all employees with more than 3 months of seniority in the firm are entitled to their full wage for that day. It should be noted that the workdays which fall between a public holiday and the weekend are days when firms can also choose to grant additional paid days off. These days are referred to as *ponts* (hereafter, bridging days) in collective agreements.

[6] If we consider a variable indicating that workday *d* is a public holiday and a variable indicating the number of public holidays that fall on a workday in a one-year period centred around *d* (*d* excluded) the correlation between the two variables is only about -0.15.

In the rest of the paper, we consider self-employed workers and use these year-to-year changes in the number and timing of public holidays to identify the effects of an extra day of paid leave granted to their spouses on (1) their own propensity to take an extra day off work at the same point in time (i.e., on their propensity to substitute a day of unpaid leave for a day of paid work at that same time), as well as on (2) their own propensity to take more or fewer days off work at more or less distant points in time. Identification will be based on the comparison of the year-on-year adjustments made by the self-employed workers who live with an employee and the self-employed workers who live with another self-employed worker.

3. Conceptual framework

In this section, we present a simple conceptual framework in order to better define the parameters identified by our empirical strategies. In this framework, the regulation of public holidays separately identifies a parameter measuring the taste of spouses for the synchronization of leisure activities and a parameter measuring the degree of intertemporal substitutability of leisure time.

The model

We consider self-employed workers who are married and whose spouses are employees. Time is divided into intervals and each interval is divided into sub-periods (typically seasons). Specifically, each time interval (denoted t) is assumed to encompass two successive sub-periods (with w=0 or 1). We assume that self-employed workers have full leeway in choosing the number and timing of their days off. By contrast, their spouses (who are employees) are entitled to paid vacation days, the number and timing of which vary from year to year depending on the dates of public holidays. Finally, we assume that there is no leisure substitutability across time intervals, only across sub-periods within time intervals.

At the start of each time interval, the problem of workers is to choose the amount of leave in each sub-period. For each time interval t, we will denote L_{0t} the amount of leave taken during the first sub-period ($w = 0$) and L_{1t} the amount of leave during the second sub-period ($w = 1$). Similarly, L_{0st} will represent the amount of leave taken by their spouses during the first sub-period and L_{1st} the amount of leave taken during the second sub-period.

With respect to labor supply behaviors, we assume that workers seek to maximize an altruistic utility function (denoted V_t) which depends on their own egotistical utility (U_t) as well as on their spouse's egotistical utility (U_{st}), namely,

$$V_t = U_t + \lambda U_{st}$$

where parameter λ captures the influence of spouses on workers' own decisions. The U_t and U_{st} functions depend on workers' consumption (denoted C_t and C_{st}) and leisure time as well as on the potential externalities generated by leisure synchronization. For simplicity, we assume that U_t and U_{st} are linear-quadratic,

$$U_t = (\boldsymbol{\varepsilon}_t + \sigma \mathbf{L}_{st})\mathbf{L}_t^{\,t} - 0.5\mathbf{L}_t \mathrm{B} \mathbf{L}_t^{\,t} + \gamma C_t \quad \text{and} \quad U_{st} = (\boldsymbol{\varepsilon}_{st} + \sigma_s \mathbf{L}_t)\mathbf{L}_{st}^{\,t} - 0.5\mathbf{L}_{st} \mathrm{B}_s \mathbf{L}_{st}^{\,t} + \gamma_s C_{st}$$

where $\mathbf{L}_t=(L_{0t},L_{1t})$ and $\mathbf{L}_{st}=(L_{0st},L_{1st})$. The vectors $\boldsymbol{\varepsilon}_t=(\varepsilon_{0t},\varepsilon_{1t})$ and $\boldsymbol{\varepsilon}_{st}=(\varepsilon_{0st},\varepsilon_{1st})$ represent unobserved (sub-period specific) shocks to the utility of being on holidays. The $\mathrm{B}=[b_{ij}]$ and $\mathrm{B}_s=[b_{sij}]$ matrices represent (2,2) matrices, with $b_{ii}=b_{sii}=1$ and $b_{ij}=\varphi$ (and $b_{ij}=\varphi_s$) when $i \neq j$. Parameters σ and σ_s represent taste-for-synchronization parameters whereas parameters φ and φ_s capture intertemporal substitutability of leisure across sub-periods. With these notations, workers are assumed to take $\mathbf{L}_{st}$ and C_{st} as given and to choose $\mathbf{L}_t$ and C_t so as to maximize V_t under income and time budget constraints. .

Identification of cross-effects

For self-employed workers, the total amount of vacation leave is not fixed and can be adapted from one time interval to the next. As their leave is uncompensated, the main constraint is an income budget constraint, which can be written $C_t+C_{st}=R_s+\mathbf{r}_t(\underline{1}-\mathbf{L}_t)^t$, where R_s represents the

income per time interval of the spouse (as set in his or her labor contract) while $\mathbf{r}_t=(r_{0t},r_{1t})$ represents self-employed workers' own hourly labor income. Note that we normalized to 1 the length of time interval, so that $\mathbf{r}_t(\underline{1}-\mathbf{L}_t)^t$ represents self-employed workers labor income.

In this setting, it is not difficult to show that the first-order conditions imply a linear relationship between own and spouse's leisure demand,

(1) $L_{wt}=\sigma_1 L_{swt}-\varphi\sigma_1 L_{s\text{-}wt}-\gamma i_{wt}+v_{wt}$ for w=0 and 1,

where $\sigma_1=(\sigma+\lambda\sigma_s)/(1-\varphi^2)$ while $i_{wt}=(r_{wt}-\varphi r_{\text{-}wt})/(1-\varphi^2)$ and $v_{wt}=(\varepsilon_{wt}-\varphi\varepsilon_{\text{-}wt})/(1-\varphi^2)$.

The first parameter of interest in equation (1) is σ_1. It provides a measure of the work-leisure substitution effect induced at w by an elementary change in the spouse's leisure time at the same point in time, holding constant the income of the spouse as well as the amount of leisure enjoyed by the spouse at other points in time (denoted -w). It is all the greater as workers enjoy spending time with their spouses (σ and σ_s large) and care about each other (λ large). The second parameter of interest is $\sigma_2=\varphi\sigma_1$. It provides a measure of the work-leisure substitution effect induced at w by an uncompensated elementary change in the spouse's leisure time at another point in time. It depends on σ_1, but it also captures very directly the extent to which days of paid leave taken at different points in time are easily substitutable with each other (φ large).

In the remainder of the paper, we identify parameters σ_1 and $\varphi\sigma_1$ by focusing on self-employed workers who live with employees and examining how their demand for leisure at a given point in time responds to independent changes in the number of public holidays enjoyed by their spouses either at the same point in time or at other points in time. Public holidays induce arbitrary changes in the overall number of paid days off that spouses can enjoy each year in each subperiod and our identifying assumption will be that these changes are unrelated to the unobserved determinants of self-employed workers' demand for leisure (as conceptualized by both i_{wt} and v_{wt} in our model). As discussed below, we will provide placebo tests for this

identifying assumption by looking at reduced-form effects of public holidays on self-employed workers whose spouses are retired.

Before moving on to the econometric analysis, it should be noted that there is a one-to-one relationship between σ_1 and σ_2 on the one hand, and $(\sigma+\lambda\sigma_s)$ and φ on the other, so that the joint identification of σ_1 and σ_2 provides direct information about $(\sigma+\lambda\sigma_s)$ and φ. Assuming for instance that the estimated σ_2 is found to be negligible whereas the estimated σ_1 is found to be very significant, it will be possible to conclude that the intertemporal substitution parameter φ is weak and that the estimated σ_1 provides a direct measure of the importance of leisure complementarities (as captured by the composite parameter $\sigma+\lambda\sigma_s$).

4. Data

The data used in this paper come from the Labor Force Surveys (LFS) conducted between 2013 and 2017 by the French Statistical Office. The LFS is conducted every quarter on a representative sample of about 55,000 households. It provides information on the main socio-demographic characteristics of all household members as well as on their employment status[7] and occupation (or former status and occupation, when they are retired or temporarily out of the labour force). In addition, since 2013, respondents provide detailed information on their working time during a specific week of the quarter (the “reference” week). In particular, we know the exact days of the week on which they worked. The reference weeks are uniformly distributed over the quarters. Households who have to be interviewed about what they did in a given reference week are surveyed on the following week. In case they are unreachable that

[7] When they have several jobs, their status is defined by the "main” one (the *emploi principal*), i.e. the one they spend the most time on.

week, other attempts are made in order to survey the household up to 2 weeks and 2 days after the reference week.

From these surveys, we build a dataset at the (individual, day) level for the period 2013-2017, which records whether individuals (and their spouses) worked that day. We restrict our working sample to workdays only (Monday through Friday) and to self-employed workers whose spouses are either employees or self-employed workers.

Table A1 in the online Appendix provides some basic descriptive statistics about the distribution of workers' leave obtained from our working sample. Their probability of taking a day off work is on average about 0.50 when their spouse takes time off in that day against only about 0.10 when their spouse works. The gap is similar regardless of whether they live with or without children. There is a clear tendency towards synchronization, even though the correlation between spouses' days of leave is far from perfect. In the remainder of the paper, we investigate the extent to which this correlation really reflects the influence that spouses exert on each other.

5. Public holidays and work-leisure substitution

In this section, we focus on our working sample of self-employed workers and we explore how they and their spouses adjust their work and leisure time in response to year-to-year changes in the number (and exact dates) of public holidays. For those whose spouses are employees, we expect a larger increase in the probability that their spouses will take a day off on days of the week that fall on a public holiday. The central question, however, is whether this increase is accompanied by a parallel increase in the probability that self-employed workers themselves will also take a day off, even if it means giving up a day of paid work. If so, the question will also arise as to whether this increase in the probability of self-employed workers not working

during public holidays leads (through an intertemporal substitution effect) to a compensatory decrease at other times of the year.

Graphical analysis

To start with, Figure 4a focuses on self-employed workers' spouses and shows the daily variations in their probability of being off work before, during and after days of public holidays, separately for those who are employees and for those who are self-employed themselves. The figure confirms that days of public holidays coincide with a significant increase in the probability of being off work for both groups of spouses. Consistent with public holidays' regulation, it also shows that this increase is significantly larger for employed spouses than for self-employed ones. Figure 4b focuses on the difference between employed and self-employed spouses and confirms that public holidays coincide with a very significant increase in this difference (about + 25 percentage points).

Given this fact, Figure 5a considers the same sample of self-employed workers as Figure 4a and shows the daily variation in their own probability of being off work, separately for those who live with an employee and for those who live with another self-employed worker. The figure reveals that public holidays coincide with an increase in own probability of being off work which is significantly larger for those who live with an employee than for those who live with another self-employed worker. Figure 5b focuses on the difference between those who live with an employee and those who live with another self-employed worker. It confirms that the difference is small (and not significantly different from zero) in the days before and after public holidays, but that public holidays coincide with a sharp rise of about 15 percentage points in this difference. The increase in the gap shown in Figure 5b represents about 60% of the increase in the gap shown in Figure 4b.

For comparison, Figures A1 and A2 in the online appendix consider weeks in the year that do not contain public holidays (and are not adjacent to weeks that contain public holidays) and

show that during these weeks (as during the days before and after public holidays) there are no significant differences in the probability of taking a day off between self-employed workers who live with an employee and those who live with another self-employed worker. Hence, the only days when differences appear are public holidays.

Taken together, our graphical analyses are suggestive that a majority of self-employed workers are willing to substitute joint leisure for paid work: the more public holidays their spouses enjoy the more days off they take on these particular days, without working more on the other days. In the next section, we develop simple regression models to further test the robustness of these graphical findings and explore heterogeneous effects across men and women as well as across workers living with and without children.

Econometric analysis

For each worker i, we denote $Spouse_{idwt}$ a dummy indicating that the spouse of worker i did not go to work on the d*th* day of week w of year t (with w=1 to 52 and d=1 to 5) and E_{iwt} a dummy indicating whether the spouse of worker i is an employee. Using these notations, our baseline regression model is written:

$$(2) \qquad Spouse_{idwt} = \alpha_0 P_{dwt} + \beta_0 P_{dwt} \times E_{iwt} + \alpha_1 B_{-dwt} + \beta_1 B_{-dwt} \times E_{iwt} + \alpha_2 A_{-dwt} + \beta_2 A_{-dwt} \times E_{iwt} + \alpha_3 R_{-dwt} + \beta_3 R_{-dwt} \times E_{iwt} + \gamma_0 E_{iwt} + X_{idwt}\gamma_1 + u_{idwt}$$

where P_{dwt} is a dummy variable indicating whether day d of week w is a public holiday for year t while variable B_{-dwt} indicates the number of public holidays that do not fall on d but that fall on another workday in the same week as d (so-called bridging days). Variable A_{-dwt} captures the number of public holidays that fall in one of the two adjacent workweeks while R_{-dwt} represents the number of days of public holidays that do not fall on the same week as d nor on adjacent weeks, but that fall on a workday in the rest of the one-year period surrounding d. Finally, X_{idwt} represents an additional set of controls which includes a full set of year fixed effects, week fixed effects, day of the week fixed effects.

Model (2) distinguishes between public holidays falling in the same week as day *d*, public holidays falling in adjacent weeks, and public holidays further away. As discussed below, we also considered augmented versions of the model where we further distinguish the two weeks immediately after the two adjacent weeks, the two weeks immediately after, etc. In general, public holidays falling several weeks away from *d* have very little effect on behavior in *d*, and these augmented versions of the model do not provide additional results.

The main parameter of interest in model (2) is β_0 which captures the differential impact of public holidays on the propensity to take a day off for employed and self-employed spouses. This parameter is identified by looking at whether the difference in the probability of taking a day off between employed and self-employed spouses for a given day *d* tends to be stronger on years when a public holiday falls on *d*. The other parameters of interest are β_1, β_2 and β_3. They capture the differential impact of public holidays on the propensity of employed and self-employed spouses to take days off in periods more or less distant from those public holidays.

Table 1 focuses on the same sample of self-employed workers as Figures 4 and 5 and shows the regression results separately for those without children (panel A) and for those with children (panel B). In both panels A and B, the first column shows the regression results for the full subsample, while column (2) shows the results for the male subsample and column (3) for the female subsample.

Consistent with public holidays' regulations (and with graphical findings), regression results shown in panel A confirm that when an additional public holiday falls on a workday, it induces a very strong increase in the probability that spouses take time off on that particular day and that this increase is significantly more important when the spouse is an employee than when he or she is a self-employed worker. The estimated difference β_0 is about 25 percentage points and estimates are similar for men and women. These first-stage regressions also show that there is no compensatory decline in the probability that employees take time off on adjacent workdays

or workweeks. In fact, we even observe an increase in this probability on adjacent workdays, even if this additional increase is much more modest than the one observed on public holidays (the estimated differential effect β_1 is only about 6 percentage points). This adjacent workdays' effect is in line with the fact that some employees receive additional days off on days between public holidays and weekends (so called bridging days). Panel B of the Table shows that we get similar results when we replicate these first-stage analyses on the sample living with children. These results are consistent with the fact that not working on public holidays is a constraint on employees, whether or not they have children.

Given these first-stage results, the next question is whether public holidays differentially affect own probability of being off work for self-employed workers living with employees relative to those living with self-employed workers. To explore this issue, Table 2 replicates the previous analysis using the same samples and specifications as Table 1, but using own probability to take a day off as the dependent variable (rather than the probability that the spouse takes a day off). Panel A of Table 2 shows the results for the sample living without children while panel B shows the results for the sample living with children.

With respect to the sample without children, panel A confirms that public holidays induce an increase in the probability of being off work that is significantly more important for self-employed workers whose spouses are employees than for those whose spouses are self-employed. The estimated differential impact is about 15 percentage points for women and 11 percentage points for men, namely 60% of the first stage effect for the latter and 43% for the former. Consistent with first stage results, there is no offsetting decline in adjacent days or weeks, but rather a slight increase in the probability that self-employed workers living with employees take additional days off. Generally speaking, these regression results are consistent with our graphical analysis and suggest that a large fraction of both female and male self-

employed workers are willing to trade paid work time for joint leisure with their spouse in the event that she benefits from additional public holidays.

Panel B of Table 2 shows that we get a similar picture when we replicate our regression analyses on the sample of self-employed workers living with children. We observe even more significant bridging day effects with this sample, which is in line with first-stage results. In the presence of children, however, the gap between men and women is different, since women now appear to be half as responsive as men to an additional day off for their spouse (9.2 vs 16.1 percentage points). Among couples with children, the reduced-form impact of an additional public holiday on self-employed workers' own probability to take a day off represents 70% of the first-stage impact for men, but only about 40% of the first-stage impact for women. Women generally spend a much greater proportion of their non-market time caring for children, which likely explains why the presence of children tends to make it less attractive for her to substitute a non-work day at home for a work day.

Finally, Tables A2 and A3 in the online appendix show the result of replicating our first-stage and reduced-form analysis when we distinguish a larger number of potential effects of public holidays that fall several weeks away from day *d* (namely the potential effect of public holidays falling 2 weeks way, 3 weeks away, 4 weeks away, 5-6 weeks away, 7-13 weeks away, beyond 13 weeks away). These additional effects are all negligible and the main results of the model are unchanged.

Public holidays after spouses' retirement

Overall Tables 1 and 2 suggest that self-employed workers adapt their demand for leisure from one year to the next, so as to be off on the same days as their spouses, even when it involves substituting leisure time for paid work. An alternative explanation for these results is that self-employed workers living with employees have a specific predilection for being off on public holidays. To further explore this idea, we replicated our regression analysis on the sample of

self-employed whose spouses are retired. We also limit the sample to those who are no older than 65, to focus as much as possible on those who have just retired. This analysis reveals that public holidays induce an increase in the probability of taking a day off which is not significantly different for self-employed workers living with former employees and for those living with former self-employed workers (Table 3, panel A). This overall increase is also of the same order of magnitude as that observed for self-employed workers living with non-retired self-employed spouses. It is only before the retirement of their spouses that public holidays induce a stronger increase in the probability to take a day off for self-employed workers living with employees.

We replicated the same analysis by focusing on the sample of self-employed workers whose spouse is not yet retired, but nevertheless, out-of-the-labor force after having already held a job (Table 3, panel B). This sample is essentially composed of self-employed men whose wives have left the labor force, at least temporarily. Again, this analysis shows that public holidays coincide with an increase in the probability of taking a day off from work that is not different for self-employed workers living with former self-employed workers and for self-employed workers living with former employees.[8]

In the end, it is only when public holidays induce a specific increase in their spouses' probability to take a day off that self-employed workers have a stronger probability to take a day off during public holidays. This finding is consistent with the assumption that the stronger effect of public holidays on self-employed workers living with employees reflects their willingness to stay synchronized with their spouses, not their specific predilection for being off on public holidays.

[8] We use information about the last job held to define whether a person is a former employee or a former self-employed.

Alternative identification strategy

To further check the robustness of our findings, we developed an alternative identification strategy building on the fact that some collective agreements authorize work on public holidays in the hotel, restaurant or food trade sectors as well as in public services that cannot interrupt their activity (e.g. hospital or police). Appendix B provides a list of occupations that are directly covered by these derogating regulations (including hotel receptionists, bakery or butcher workers, hospital orderlies, nurses…). They represent about 15% of the total number of employees and we checked that the proportion of employees who work on public holidays is on average much higher for these specific occupations (32%) than for the other ones (13%). In this context, the question becomes whether self-employed workers who live with employees whose occupations are on the derogatory list actually take less days off on public holidays than self-employed workers who live with employees whose occupations are not on the list.

To shed light on this issue, Table 4 and Table 5 focus on the sample of self-employed workers whose spouses are employees and replicate our first-stage and reduced-form regression analysis using those whose spouse's occupation is on the list as "treatment" group and those whose spouse's occupation is not on the list as "control" group. Table 4 shows the results of the first stage regressions for individuals without children (panel A) as well as for individuals without children (panel B). Consistent with collective agreements, these first-stage results confirm that when an additional public holiday falls on a workday, it induces a much smaller increase in the probability that spouses take time off on that particular day when the spouse's occupation is on the list than when the spouse's occupation is not on the list. The estimated gaps appear to be even larger in magnitude than the estimated gaps between employed and self-employed spouses shown in Table 1. For example, when we focus on the sample without children, the magnitude of the first-stage gap is about 35.9 percentage points in Table 4 (when we compare spouses on the list and not on the list), while it only 25 percentage points in Table 1 (when we compare

employed and self-employed spouses). First-stage regressions in Table 4 also confirm that there is no offsetting rise in the probability that spouses on the list take time off on adjacent workdays or workweeks. In fact, consistent with our previous analysis, we even observe a further decrease in their probability of being off work on adjacent workdays and workweeks.

Given these first-stage results, the question is whether public holidays differentially affect own probability of being off work for self-employed workers living with employees whose occupation is on the derogatory list relative to those living with employees whose occupation is not on the list. To explore this issue, Table 5 replicates the previous analysis using own probability to take a day off as the dependent variable (rather than the probability that the spouse takes a day off).

With respect to individuals living without children, the panel A of Table 5 confirms that public holidays induce an increase in the probability of being off work that is significantly less important for self-employed workers whose spouse's occupation is on the list than for those whose spouse's occupation is not on the list. The estimated differential impact is about -13 percentage points for men and -16 percentage points for women, which corresponds to about 40% of the first stage effect for both men and women. Also, once again, there is no compensatory rise in adjacent days or weeks, but rather a slight further decrease in the probability that self-employed workers living with employees whose occupation is on the list take days off.

Consistent with our previous findings, the panel B of Table 5 shows that we get a somewhat different picture when we focus on individuals living with children. On the one hand, men living with children are as affected as men without children by an additional day off for their spouse. On the other hand, women living with children appear to be completely unaffected. The estimated reduced form impact of public holidays is about -11.3 percentage points for men (about 33% of the first stage effect) whereas it is close to zero for women. This result provides

further confirmation that in the presence of children, women are much less likely to substitute a day with their family for a work day.

6. Concluding remarks

This article draws on French regulations of paid leave and public holidays to assess the extent to which male and female workers synchronize their leisure time with that of their spouses. These regulations imply that public holidays may fall quasi randomly either during the weekend or outside the week-end, depending on the year, which generates exogenous and income-neutral variation in the number and timing of paid days off that employees (but not self-employed workers) are entitled to. Employees benefit, in certain years, at certain specific times of the year, from additional days off. When comparing self-employed workers who are married to employees with those who are married to other self-employed workers, we show that a majority of the former choose to take more days off in years when their spouses receive additional leave and that they take them at the same time as their spouses. By comparing couples with and without children, we also show that the willingness to synchronize with one's spouse is more important for women than for men when there are no children in the household, but that the reverse is true when there are children in the household. Children tend to increase the value of time spent with one's spouse for men, not for women.

Overall, our paper provides estimates of cross-effects on work and leisure time that are much larger than those previously found in the literature and much more consistent with the fact that time spent with one's spouse is generally associated with higher levels of subjective well-being. It also highlights that the willingness to synchronize with one's spouse is unevenly distributed across families and between men and women. Generally speaking, these results help to understand why reforms affecting the working hours and leave entitlements of particular

categories of employees - such as reforms allowing Sunday work in shops in exchange for more days off - can affect the working hours and well-being of many more workers, including self-employed workers. They also suggest that the final outcome of these reforms may be very different depending on whether they primarily affect a more female or a more male subset of the labor force. Finally, our results also help to understand the tensions generated by regulations that allow employers to adjust their employees' working hours and days more freely to fluctuations in business activity. By promoting firm flexibility, these reforms aim to boost growth and job creation, but they are not necessarily compatible with employees' own demand for working hour flexibility, their desire to share more time with their spouses and to better balance work and family life.

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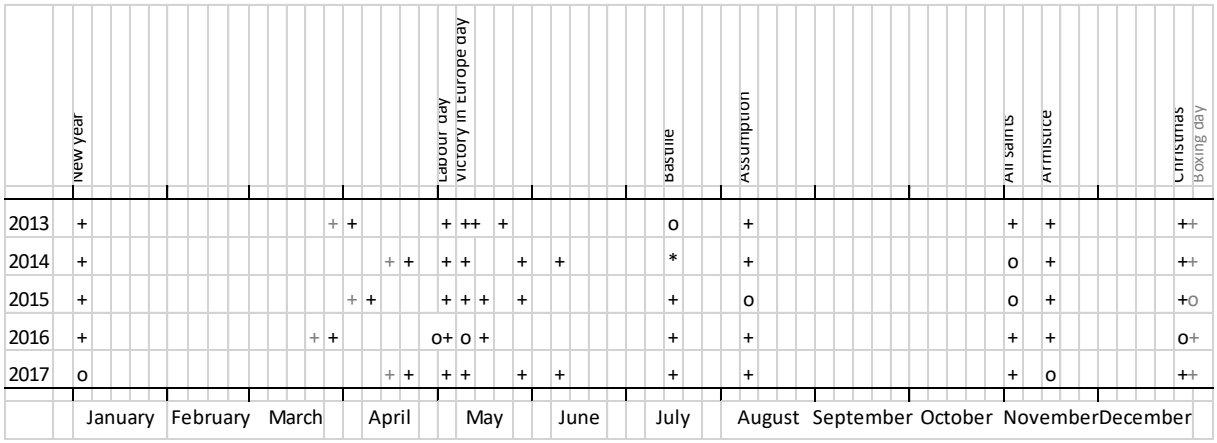
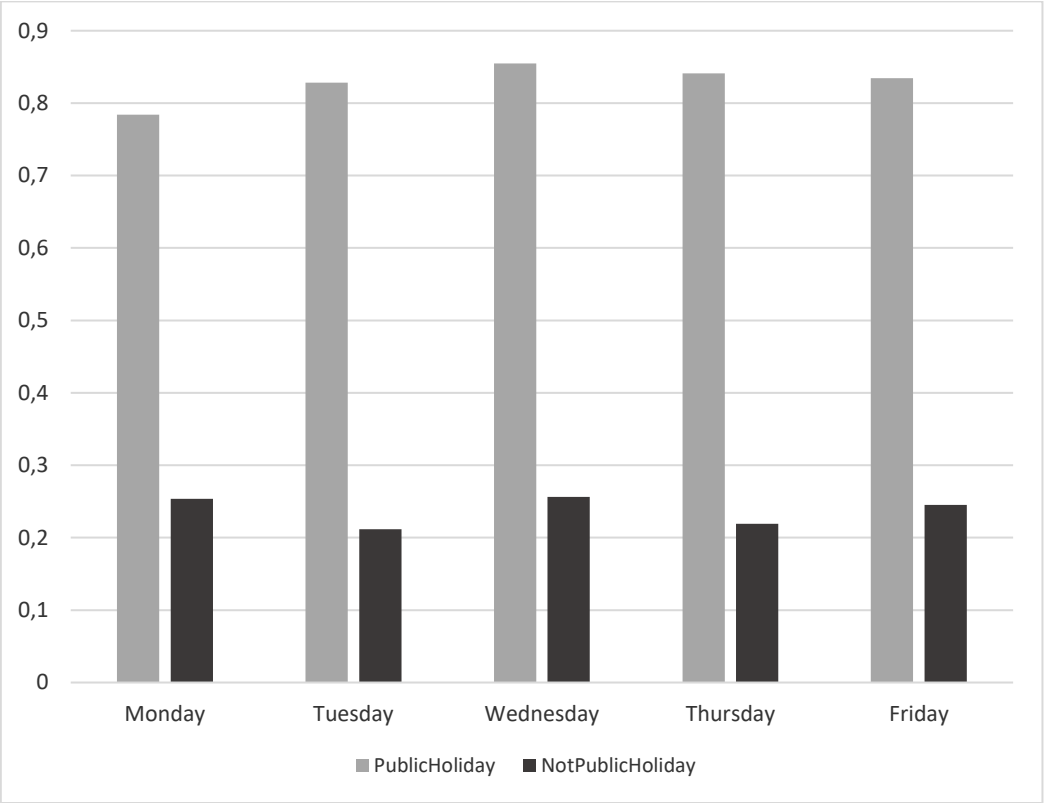
Figure 1. Distribution of public holidays across the weeks of the year, between 2013 and 2017



Note: the figure shows public holidays falling during weekdays (+ symbol) and public holidays falling during weekends (o symbol) for the 2013-2017 period. The symbols in grey correspond to the two public holidays that are specific to the three Alsace Moselle districts.

Figure 2: Public holidays and the proportion of employees not working



Note: the figure shows the proportion of employees who work on a given workday when it falls on a public holiday (light grey bar) and when it does not fall on a public holiday (dark grey bar).
Source: Labor Force Surveys, 2013-2017, Insee.

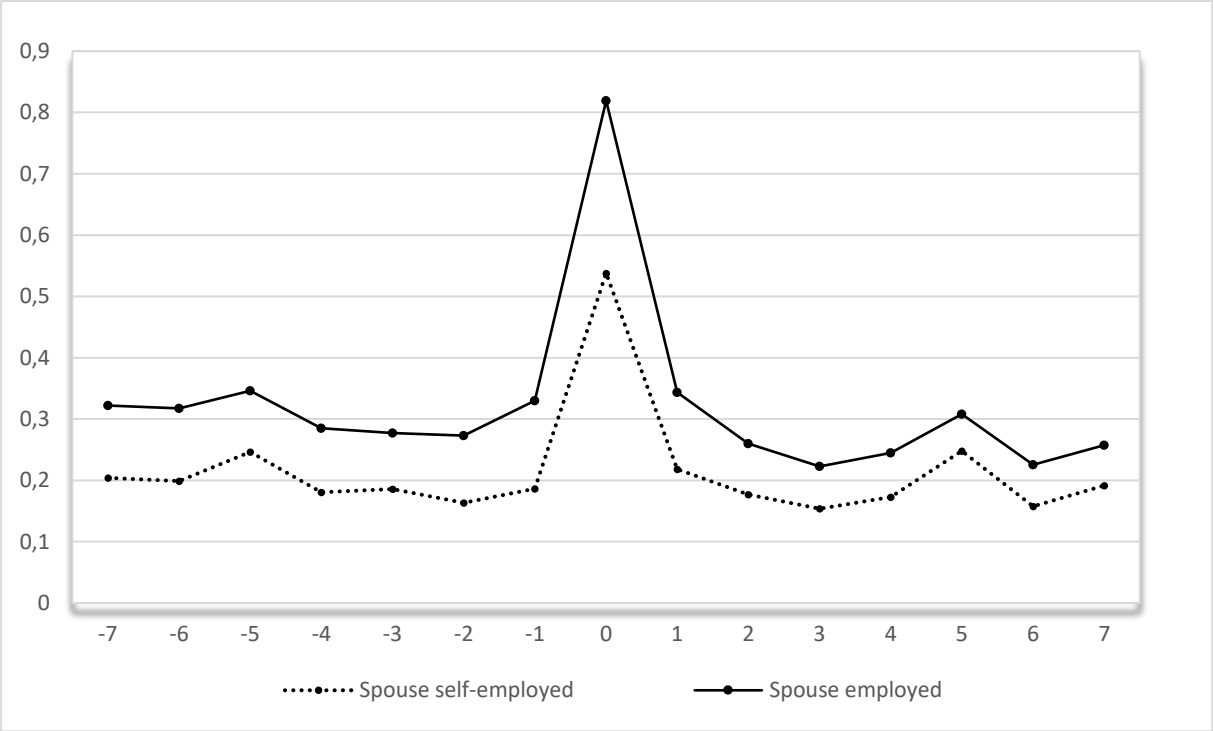
Figure 3. Distribution of public holidays across the days of the week (2013-2017 period)

Public holiday	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*	*Sunday*
New year	0	1	1	1	1	0	1
Labour	1	0	1	1	1	0	1
Victory in Europe	1	0	1	1	1	0	1
Bastille	1	1	0	1	1	0	1
the Assumption of Mary	1	1	0	1	1	1	0
All saints	0	1	1	0	1	1	1
Armistice	1	1	1	0	1	1	0
Christmas	1	0	1	1	1	0	1
Total	6	5	6	6	8	3	6
Boxing day	*1*	*1*	*0*	*1*	*1*	*1*	*0*
Total (in Alsace Moselle)	*7*	*6*	*6*	*7*	*9*	*4*	*6*

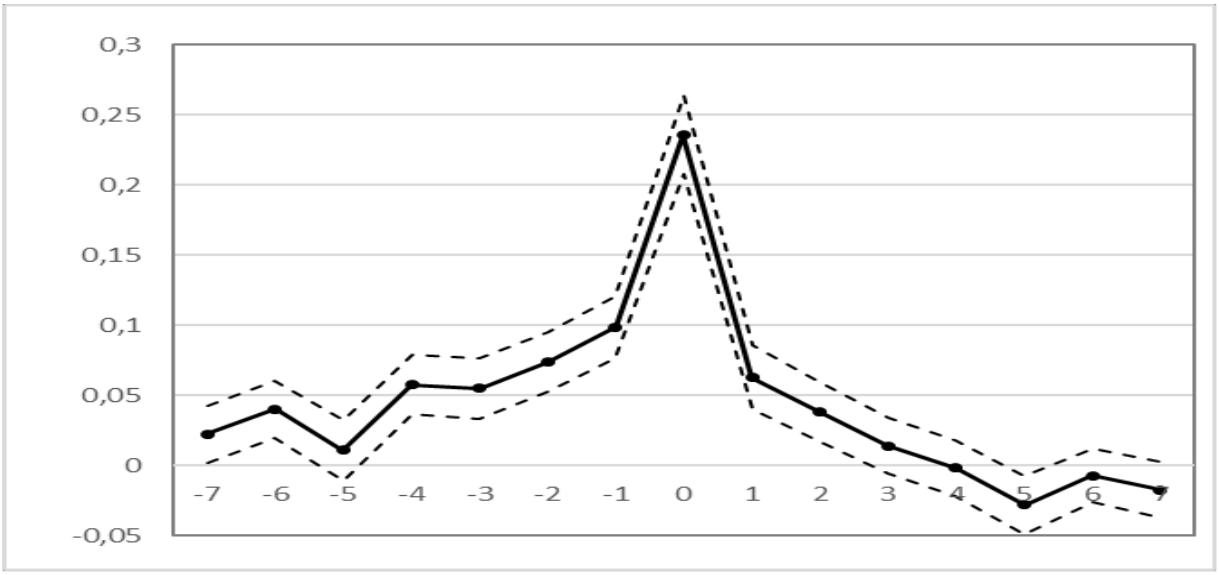
Reading: between 2013 and 2017, the Labour Day (May, 1st) falls once on a Monday, once on a Wednesday, once on a Thursday, once on a Friday and once on a Sunday.

Figure 4. Public holidays and spouses' days off

(a) Probability of spouses taking a day off



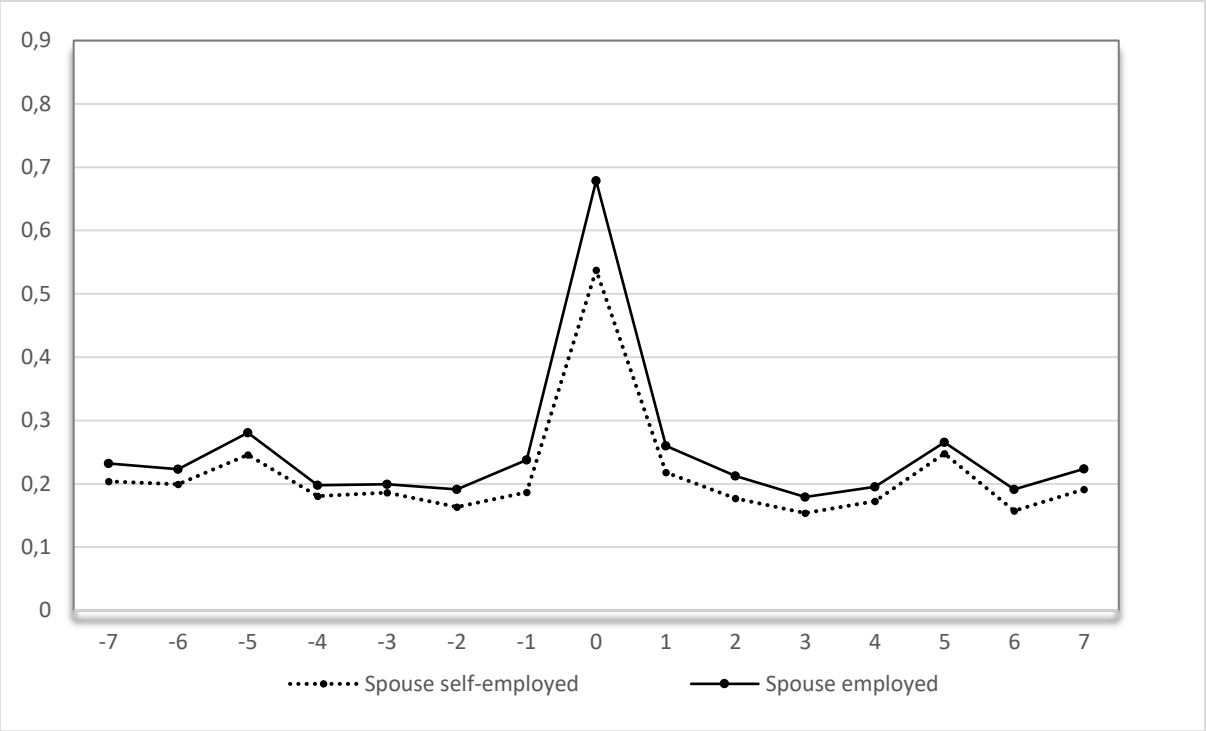
(b) **Difference in probability of taking a day off between employed and self-employed spouses**



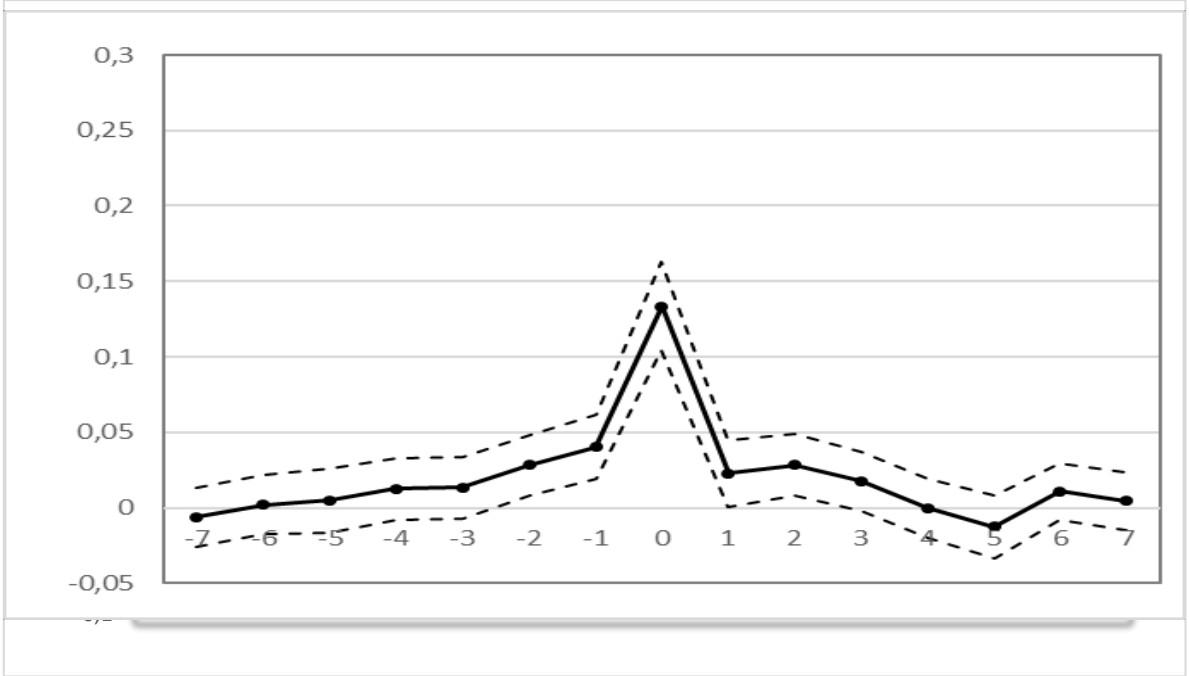
Note: the figures refer to the sample of self-employed workers whose spouses are either self-employed workers or full-time employees. Figure (a) shows the proportion of spouses who do not work on a given weekday when it falls on a public holiday (d=0), as well as when it falls on one of the seven weekdays preceding that public holiday (d=-1,...-7) or on one of the seven weekdays following that holiday (d=1,...7). The dashed line refers to self-employed spouses while the solid line refers to employed spouses. Figure (b) shows the estimated difference between the solid and dashed lines plotted in Figure (a), the average difference outside the [-7,+7] interval being taken as a reference. 95% confidence intervals are shown in dashed lines. Source: Labor Force Survey, 2013-2017, Insee.

Figure 5. Public holidays and own days off

(a) Probability of taking a day off



(b) Differences in own probability of taking a day off depending on whether the spouse is employed or not



Note: same sample and source as Figure 4. Figure (a) shows the proportion not working on a given weekday when it falls on a public holiday (d=0), as well as when it falls on one of the seven weekdays preceding that public holiday (d=-1,...-7) or on one of the seven weekdays following that holiday (d=1,...7). The dashed line refers to those whose spouses are self-employed and the solid line to those whose spouses are employed. Figure (b) shows the estimated difference between the solid and dashed lines plotted in Figure (a), the average difference outside the [-7,+7] interval being taken as a reference. 95% confidence intervals are shown in dashed lines..

Table 1. Public holidays and the probability of spouses of self-employed workers taking a day off

	(1) All	(2) Male	(3) Female
Panel A: couples without children			
Public holiday	0.347	0.324	0.373
	(0.023)	(0.025)	(0.024)
Public holiday x spouse employee	0.250	0.254	0.257
	(0.024)	(0.027)	(0.031)
Nb. public holidays on the same week	0.017	-0.003	0.037
	(0.014)	(0.017)	(0.016)
Nb. pub. hol. on same week x spouse employee	0.058	0.068	0.053
	(0.017)	(0.020)	(0.024)
Nb. public holiday on adjacent weeks	-0.005	-0.004	-0.004
	(0.010)	(0.012)	(0.011)
Nb. pub. hol. adjacent weeks x spouse employee	0.016	0.012	0.024
	(0.010)	(0.013)	(0.014)
Nb. public holiday during the rest of the year	0.000	-0.001	0.002
	(0.004)	(0.005)	(0.005)
Nb. pub. hol. rest of the year x spouse employee	0.000	0.002	-0.002
	(0.005)	(0.006)	(0.006)
Observations	79,640	47,125	32,515
Mean dep. var.	0.192	0.215	0.159
Panel B: couples with children			
Public holiday	0.333	0.326	0.341
	(0.015)	(0.017)	(0.017)
Public holiday x spouse employee	0.229	0.229	0.231
	(0.016)	(0.019)	(0.021)
Nb. public holidays on the same week	-0.031	-0.036	-0.024
	(0.010)	(0.013)	(0.011)
Nb. pub. hol. on same week x spouse employee	0.101	0.107	0.091
	(0.011)	(0.014)	(0.014)
Nb. public holiday on adjacent weeks	-0.009	-0.011	-0.006
	(0.006)	(0.008)	(0.008)
Nb. pub. hol. adjacent weeks x spouse employee	0.016	0.016	0.015
	(0.007)	(0.009)	(0.009)
Nb. public holiday during the rest of the year	0.002	0.000	0.004
	(0.003)	(0.004)	(0.003)
Nb. pub. hol. rest of the year x spouse employee	0.002	0.005	-0.002
	(0.003)	(0.004)	(0.004)
Observations	177,625	103,480	74,145
Mean dep. var.	0.206	0.236	0.165

Note: the table refers to the same sample of self-employed as Figure 4. It shows the results of regressing a variable indicating that their spouses do not work on a given weekday *d* on variables indicating (1) that *d* is a public holiday, (2) the number of public holidays falling on the same week as *d* (but not on *d*), (3) the number of public holidays falling on adjacent weeks, (4) the number of public holidays falling within the remainder of the one-year interval surrounding *d*, as well as the interactions between these 4 variables and a dummy indicating that spouses are employees. Additional controls include full sets of day of the week, week of the year, and year of observation fixed effects, as well as controls for school holidays and controls for industry, education, age, gender, occupation. Column (1) shows the results for the full sample, while col. (2) and (3) show the results for the male and female subsamples. Standard errors clustered at the household level are reported in parentheses. Source*:* Labor Force Survey, 2013-2017, Insee.

Table 2. Public holidays and own probability of taking a day off

	(1) All	(2) Male	(3) Female
Panel A: without children			
Public holiday	0.345	0.363	0.324
	(0.022)	(0.024)	(0.025)
Public holiday x spouse employee	0.129	0.110	0.154
	(0.025)	(0.029)	(0.034)
Nb. public holidays on the same week	0.021	0.0037	0.004
	(0.014)	(0.016)	(0.017)
Nb. pub. hol. on same week x spouse employee	0.013	-0.000	0.026
	(0.016)	(0.018)	(0.023)
Nb. public holiday on adjacent weeks	-0.004	-0.005	-0.006
	(0.010)	(0.010)	(0.013)
Nb. pub. hol. adjacent weeks x spouse employee	0.021	0.024	0.019
	(0.010)	(0.011)	(0.015)
Nb. public holiday during the rest of the year	-0.002	-0.003	-0.001
	(0.004)	(0.005)	(0.005)
Nb. pub. hol. rest of the year x spouse employee	0.003	0.002	0.007
	(0.005)	(0.005)	(0.007)
Observations	79,640	47,125	32,515
Mean dep. var.	0.171	0.148	0.205
Panel B: with children			
Public holiday	0.349	0.357	0.340
	(0.015)	(0.016)	(0.017)
Public holiday x spouse employee	0.137	0.161	0.092
	(0.017)	(0.019)	(0.022)
Nb. public holidays on the same week	-0.009	-0.006	-0.013
	(0.010)	(0.010)	(0.013)
Nb. pub. hol. on same week x spouse employee	0.047	0.051	0.038
	(0.010)	(0.012)	(0.015)
Nb. public holiday on adjacent weeks	0.000	0.001	-0.001
	(0.006)	(0.007)	(0.009)
Nb. pub. hol. adjacent weeks x spouse employee	0.003	0.010	-0.009
	(0.006)	(0.007)	(0.009)
Nb. public holiday during the rest of the year	0.001	0.002	-0.000
	(0.003)	(0.003)	(0.004)
Nb. pub. hol. rest of the year x spouse employee	0.001	0.002	-0.002
	(0.003)	(0.003)	(0.005)
Observations	177,625	103,480	74,145
Mean dep. var.	0.181	0.138	0.242

Note: the table shows the regression result of the same model as Table 1, on the same sample of self-employed workers, when the dependent variable is a dummy indicating that they (rather than their spouses) do not work on a given weekday *d*. Source: Labor Force Survey, 2013-2017, Insee. Standard errors clustered at the household level are reported in parentheses.

Table 3. Public holidays effects when spouses are no longer in the labor force

	(1) All	(2) Male	(3) Female
Panel A: spouse is retired			
Public holiday	0.348	0.400	0.326
	(0.062)	(0.115)	(0.073)
Public holiday x spouse former employee	0.053	0.025	0.024
	(0.065)	(0.116)	(0.081)
Nb. public holidays on the same week	-0.003	-0.026	-0.003
	(0.041)	(0.076)	(0.049)
Nb. pub. hol. on the same week x spouse former employee	0.030	0.064	0.010
	(0.042)	(0.077)	(0.053)
Nb. pub. hol. on adjacent weeks	0.006	-0.059	0.023
	(0.025)	(0.041)	(0.031)
Nb. pub. hol. on adjacent weeks x spouse former employee	-0.007	0.038	-0.010
	(0.025)	(0.040)	(0.034)
Nb. pub. hol. on the rest of the year	0.019	-0.004	0.016
	(0.014)	(0.026)	(0.015)
Nb. pub. hol. on the rest of the year x spouse former employee	-0.021	0.002	-0.017
	(0.014)	(0.026)	(0.017)
Observations	14,355	7,610	6,745
Mean dep. var.	0.222	0.202	0.243
Panel B: spouse not retired, but out of the labor force			
Public holiday	0.453	0.452	0.371
	(0.045)	(0.050)	(0.101)
Public holiday x spouse former employee	0.031	0.041	0.016
	(0.047)	(0.052)	(0.112)
Nb. public holidays on the same week	0.013	-0.006	0.033
	(0.035)	(0.041)	(0.072)
Nb. pub. hol. on the same week x spouse former employee	0.027	0.054	-0.085
	(0.036)	(0.041)	(0.080)
Nb. pub. hol. on adjacent weeks	0.036	0.032	0.031
	(0.023)	(0.027)	(0.045)
Nb. pub. hol. on adjacent weeks x spouse former employee	-0.028	-0.024	-0.046
	(0.022)	(0.026)	(0.044)
Nb. pub. hol. on the rest of the year	-0.016	-0.018	-0.015
	(0.009)	(0.010)	(0.020)
Nb. pub. hol. on the rest of the year x spouse former employee	0.015	0.019	-0.009
	(0.009)	(0.010)	(0.021)
Observations	34,310	30,630	3,680
Mean dep. var.	0.185	0.177	0.244

Note: the table shows the regression results of the same model as in Table 5 when the dummy indicating that spouses are employees is replaced by a dummy indicating that they are former employees. Panel A refers to the sample of self-employed whose spouses are retired (either as former self-employed or former employees) and aged 65 or less. Panel B refers to the sample of self-employed whose spouses are not retired, but out of the labor market (again, as either former self-employed or former employees) aged 65 or less. Source: Labor Force Survey, 2013-2017, Insee. Standard errors clustered at the household level are reported in parentheses.

Table 4. Public holidays and the probability of spouses of self-employed workers taking a day off: alternative source of identification

	(1) All	(2) Male	(3) Female
Panel A: without children			
Public holiday	0.633	0.622	0.658
	(0.016)	(0.021)	(0.027)
Public holiday x spouse on the list	-0.359	-0.341	-0.420
	(0.037)	(0.044)	(0.069)
Nb. pub. hol. on the same week	0.065	0.059	0.079
	(0.016)	(0.020)	(0.025)
Nb. pub. hol. same week x spouse on the list	-0.100	-0.078	-0.173
	(0.032)	(0.037)	(0.071
Nb. pub. hol. on adjacent weeks	0.009	0.013	0.004
	(0.011)	(0.014)	(0.018)
Nb. pub. hol. adjacent weeks x spouse on the list	-0.066	-0.071	-0.047
	(0.020)	(0.023)	(0.039)
Nb. pub. hol. on the rest of the year	0.002	0.001	0.004
	(0.005)	(0.006)	(0.007)
Nb. pub. hol. rest of the year x spouse on list	-0.022	-0.023	-0.019
	(0.008)	(0.010)	(0.013)
Observations	40,110	27,360	12,750
Mean dep. var.	0.220	0.234	0.189
Panel B: with children			
Public holiday	0.598	0.605	0.585
	(0.011)	(0.013)	(0.018)
Public holiday x spouse on the list	-0.326	-0.341	-0.286
	(0.025)	(0.030)	(0.048)
Nb. pub. hol. on the same week	0.061	0.070	0.044
	(0.010)	(0.012)	(0.016)
Nb. pub. hol. same week x spouse on the list	-0.043	-0.059	-0.005
	(0.020)	(0.024)	(0.037)
Nb. pub. hol. on adjacent weeks	-0.000	-0.001	0.005
	(0.007)	(0.009)	(0.010)
Nb. pub. hol. adjacent weeks x spouse on the list	-0.016	-0.004	-0.050
	(0.013)	(0.015)	(0.023)
Nb. pub. hol. on the rest of the year	0.005	0.005	0.004
	(0.003)	(0.003)	(0.004)
Nb. pub. hol. rest of the year x spouse on list	-0.000	0.001	-0.003
	(0.006)	(0.007)	(0.010)
Observations	101,855	65,595	36,260
Mean dep. var.	0.231	0.250	0.197

Note: the table refers to the sample of self-employed workers whose spouse is a full-time employee. The estimated models are the same as in Table 1, except that the dummy indicating that the spouse is an employee is replaced by a dummy indicating that the spouse's occupation is on the list in Appendix B. Source: Labor Force Survey, 2013-2017, Insee. Standard errors clustered at the household level are reported in parentheses.

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Table 5: Public holidays and own probability of taking a day off: alternative source of identification

	(1) All	(2) Male	(3) Female
Panel A: without children			
Public holiday	0.473	0.476	0.459
	(0.018)	(0.023)	(0.031)
Public holiday x spouse on the list	-0.134	-0.125	-0.159
	(0.042)	(0.049)	(0.083)
Nb. pub. hol. on the same week	0.018	0.021	0.012
	(0.014)	(0.017)	(0.025)
Nb. pub. hol. same week x spouse on the list	-0.030	-0.015	-0.090
	(0.030)	(0.034)	(0.058)
Nb. pub. hol. on adjacent weeks	0.010	0.013	-0.001
	(0.010)	(0.012)	(0.018)
Nb. pub. hol. adjacent weeks x spouse on the list	-0.031	-0.032	-0.019
	(0.018)	(0.021)	(0.035)
Nb. pub. hol. on the rest of the year	-0.002	-0.002	-0.001
	(0.004)	(0.005)	(0.007)
Nb. pub. hol. rest of the year x spouse on list	-0.007	-0.009	-0.006
	(0.007)	(0.008)	(0.014)
Observations	40,110	27,360	12,750
Mean dep. var.	0.179	0.154	0.231
Panel B: with children			
Public holiday	0.494	0.537	0.422
	(0.011)	(0.014)	(0.019)
Public holiday x spouse on the list	-0.077	-0.113	-0.011
	(0.025)	(0.030)	(0.045)
Nb. pub. hol. on the same week	0.033	0.046	0.011
	(0.009)	(0.010)	(0.016)
Nb. pub. hol. same week x spouse on the list	0.003	-0.019	0.059
	(0.017)	(0.020)	(0.035)
Nb. pub. hol. on adjacent weeks	0.003	0.011	-0.013
	(0.006)	(0.007)	(0.011)
Nb. pub. hol. adjacent weeks x spouse on the list	-0.008	-0.005	-0.024
	(0.010)	(0.012)	(0.022)
Nb. pub. hol. on the rest of the year	0.002	0.004	-0.003
	(0.002)	(0.003)	(0.004)
Nb. pub. hol. rest of the year x spouse on list	0.000	-0.001	0.005
	(0.005)	(0.005)	(0.010)
Observations	101,855	65,595	36,260
Mean dep. var.	0.187	0.140	0.274

Note: the table refers to the sample of self-employed workers whose spouse is a full-time employee. The estimated models are the same as in Table 2 except that the dummy indicating that the spouse is an employee is replaced by a dummy indicating that the spouse's occupation is on the list in Appendix B. Source: Labor Force Survey, 2013-2017, Insee. Standard errors clustered at the household level are reported in parentheses.

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Online Appendix

Table A1. Synchronization of days of leave in couples with and without children

	Probability to take a day off		
	All	Male	Female
	(1)	(2)	(3)
Panel A : without children			
When spouse takes a day off	0.529	0.467	0.651
When spouse works	0.086	0.061	0.121
Number of observations	79,640	47,125	32,515
Panel B : with children			
When spouse takes a day off	0.491	0.409	0.654
When spouse works	0 .101	0.054	0.161
Number of observations	177,625	103,480	74145

Note: the table refers to the same working sample as Table 1.
Reading: Among couples without children, the probability that self-employed workers take a day off work is 0.529 when their spouses are off work, but only 0.086 when their spouses are not off work.

Table A2. Public holidays and the probability that the spouse takes a day off

	(1) All	(2) Male	(3) Female
Panel A: without children			
Public holiday	0.341	0.315	0.371
	(0.023)	(0.025)	(0.025)
Public holiday x spouse employee	0.252	0.258	0.254
	(0.025)	(0.028)	(0.031)
Nb. pub. hol. on same week w_0 x spouse employee	0.060	0.071	0.049
	(0.017)	(0.020)	(0.024)
Nb. pub. hol. on weeks w_0-1 or w_0+1 x spouse employee	0.024	0.020	0.028
	(0.011)	(0.013)	(0.015)
Nb. pub. hol. on weeks w_0-2 or w_0+2 x spouse employee	0.002	-0.000	0.012
	(0.012)	(0.015)	(0.016)
Nb. pub. hol. on weeks w_0-3 or w_0+3 x spouse employee	-0.018	-0.019	-0.020
	(0.012)	(0.015)	(0.016)
Nb. pub. hol. on weeks w_0-4 or w_0+4 x spouse employee	-0.014	-0.003	-0.030
	(0.012)	(0.015)	(0.015)
Nb. pub. hol. rest of the quarter x spouse employee	-0.001	0.001	-0.007
	(0.008)	(0.010)	(0.012)
Nb. pub. hol. rest of the semester x spouse employee	0.010	0.013	0.003
	(0.006)	(0.007)	(0.008)
Nb. pub. hol. rest of the year x spouse employee	-0.002	-0.001	-0.003
	(0.005)	(0.006)	(0.006)
Observations	79,640	47,125	32,515
Mean dep. var.	0.192	0.215	0.159

Table A2. Public holidays and the probability that the spouse takes a day off (continued)

	(1) All	(2) Male	(3) Female
Panel B: with children			
Public holiday	0.331	0.324	0.341
	(0.016)	(0.018)	(0.018)
Public holiday x spouse employee	0.232	0.231	0.234
	(0.017)	(0.019)	(0.021)
Nb. pub. hol. on same week w_0 x spouse employee	0.104	0.109	0.094
	(0.011)	(0.014)	(0.015)
Nb. pub. hol. on weeks w_0-1 or w_0+1 x spouse employee	0.021	0.021	0.019
	(0.007)	(0.009)	(0.009)
Nb. pub. hol. on weeks w_0-2 or w_0+2 x spouse employee	-0.006	-0.001	-0.016
	(0.008)	(0.010)	(0.010)
Nb. pub. hol. on weeks w_0-3 or w_0+3 x spouse employee	-0.008	-0.008	-0.013
	(0.008)	(0.010)	(0.010)
Nb. pub. hol. on weeks w_0-4 or w_0+4 x spouse employee	-0.002	0.003	-0.008
	(0.007)	(0.010)	(0.010)
Nb. pub. hol. rest of the quarter x spouse employee	-0.020	-0.023	-0.018
	(0.005)	(0.007)	(0.007)
Nb. pub. hol. rest of the semester x spouse employee	0.008	0.010	0.002
	(0.004)	(0.005)	(0.005)
Nb. pub. hol. rest of the year x spouse employee	0.001	0.004	-0.003
	(0.003)	(0.004)	(0.004)
Observations	177,625	103,480	74,145
Mean dep. var.	0.206	0.236	0.165

Note: the table refers to the same sample of self-employed as Table 1. It shows the results of regressing a variable indicating that their spouses do not work on a given weekday *d* on variables indicating (1) that *d* falls on a public holiday, (2) the number of public holidays falling on the same week as *d* (but not on *d*), (3) the number of public holidays falling on the 2 adjacent weeks, … etc. and (9) the number of public holidays falling within the remainder of the one-year interval surrounding *d*, as well as the interactions between these 9 variables and a dummy indicating that spouses are employees. Additional controls include full sets of day of the week, week of the year, and year of observation fixed effects, as well as controls for school holidays and controls for industry, education, age, gender, occupation. Column (1) shows the results for the whole sample, while col. (2) and (3) show the results for the male and female subsamples. Standard errors clustered at the household level are reported in parentheses. Source*:* Labor Force Survey, 2013-2017, Insee.

Table A3. Public holidays and own probability of taking a day off

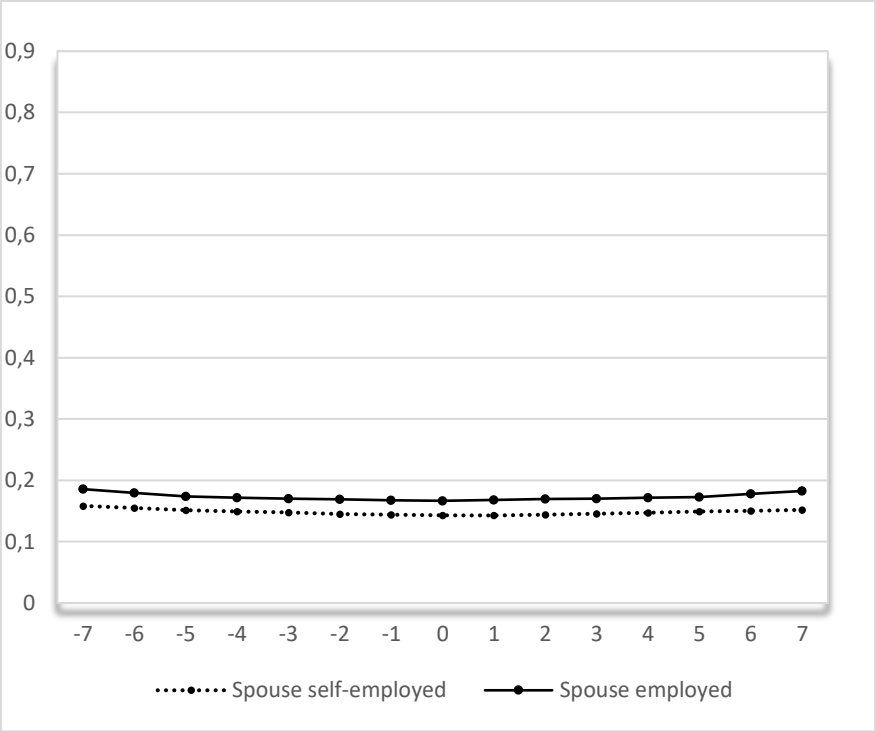
	(1) All	(2) Male	(3) Female
Panel A: without children			
Public holiday	0.346	0.364	0.325
	(0.022)	(0.024)	(0.025)
Public holiday x spouse employee	0.129	0.110	0.153
	(0.026)	(0.029)	(0.034)
Nb. pub. hol. on same week w_0 x spouse employee	0.013	0.001	0.026
	(0.016)	(0.018)	(0.023)
Nb. pub. hol. on weeks w_0-1 or w_0+1 x spouse employee	0.024	0.027	0.022
	(0.011)	(0.012)	(0.016)
Nb. pub. hol. on weeks w_0-2 or w_0+2 x spouse employee	0.012	0.014	0.011
	(0.011)	(0.013)	(0.016)
Nb. pub. hol. on weeks w_0-3 or w_0+3 x spouse employee	-0.006	-0.003	-0.013
	(0.011)	(0.013)	(0.017)
Nb. pub. hol. on weeks w_0-4 or w_0+4 x spouse employee	-0.001	-0.002	-0.000
	(0.011)	(0.012)	(0.017)
Nb. pub. hol. rest of the quarter x spouse employee	-0.005	-0.003	-0.007
	(0.008)	(0.009)	(0.012)
Nb. pub. hol. rest of the semester x spouse employee	0.008	0.008	0.011
	(0.006)	(0.006)	(0.008)
Nb. pub. hol. rest of the year x spouse employee	0.002	0.000	0.007
	(0.005)	(0.005)	(0.007)
Observations	79,640	47,125	32,515
Mean dep. var.	0.171	0.148	0.205

Table A3. Public holidays and own probability of taking a day off (continued)

	(1) All	(2) Male	(3) Female
Panel B: with children			
Public holiday	0.349	0.356	0.341
	(0.015)	(0.017)	(0.018)
Public holiday x spouse employee	0.138	0.162	0.093
	(0.017)	(0.019)	(0.022)
Nb. pub. hol. on same week w_0 x spouse employee	0.048	0.052	0.039
	(0.011)	(0.012)	(0.016)
Nb. pub. hol. on weeks w_0-1 or w_0+1 x spouse employee	0.005	0.011	-0.007
	(0.006)	(0.007)	(0.010)
Nb. pub. hol. on weeks w_0-2 or w_0+2 x spouse employee	-0.002	-0.004	0.004
	(0.007)	(0.008)	(0.011)
Nb. pub. hol. on weeks w_0-3 or w_0+3 x spouse employee	-0.002	0.005	-0.010
	(0.007)	(0.008)	(0.011)
Nb. pub. hol. on weeks w_0-4 or w_0+4 x spouse employee	-0.000	-0.006	0.005
	(0.007)	(0.008)	(0.011)
Nb. pub. hol. rest of the quarter x spouse employee	-0.009	-0.007	-0.011
	(0.005)	(0.005)	(0.008)
Nb. pub. hol. rest of the semester x spouse employee	0.002	0.003	0.003
	(0.004)	(0.004)	(0.006)
Nb. pub. hol. rest of the year x spouse employee	0.000	0.002	-0.003
	(0.003)	(0.003)	(0.005)
Observations	177,625	103,480	74,145
Mean dep. var.	0.181	0.138	0.242

Note: the table shows the regression result of the same model as Table A2, on the same sample of self-employed workers, when the dependent variable is a dummy indicating that they (rather than their spouses) do not work during a given weekday *d*. Source: Labor Force Survey, 2013-2017, Insee. Standard errors clustered at the household level are reported in parentheses.

Figure A1. Probability that spouses take a day off before, during and after regular workdays



Note: the figure refers to the sample of self-employed workers whose spouses are either self-employed workers or full-time employees. It shows the proportion of spouses who do not work on a given weekday when it does not fall on a public holiday (d=0), as well as when it falls on one of the seven previous weekdays (d=-1,...-7) or on one of the seven following weekdays (d=1,...7). The dashed line refers to self-employed spouses while the solid line refers to employed spouses. Source: Labor Force Survey, 2013-2017, Insee.

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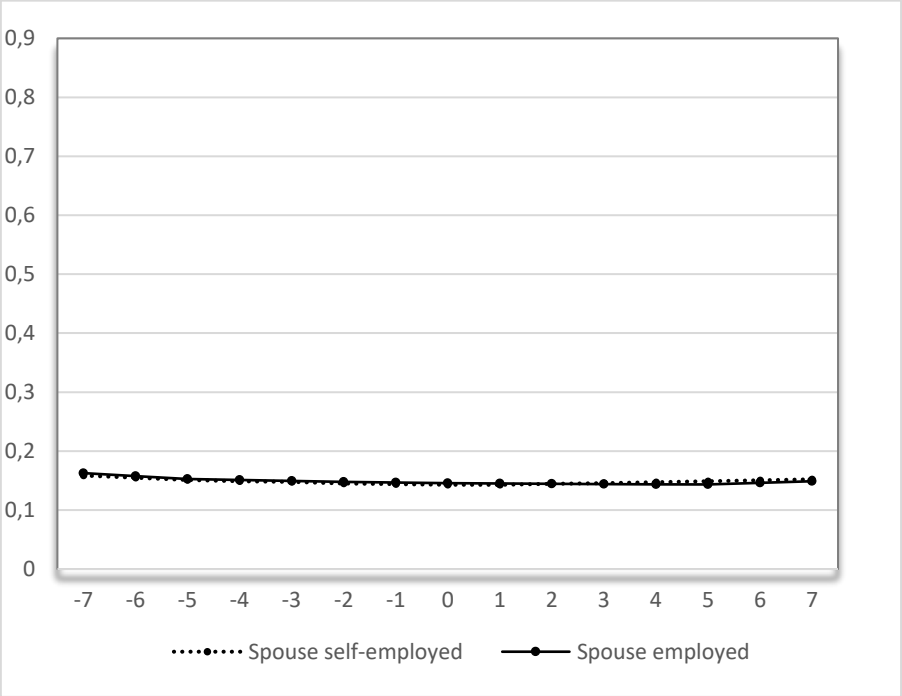
Figure A2. Probability of taking a day off before, during and after regular workdays



Note: the figure refers to the sample of self-employed workers whose spouses are either self-employed workers or full-time employees. It shows the proportion who do not work on a given weekday when it does not fall on a public holiday (d=0), as well as when it falls on one of the seven previous weekdays (d=-1,...-7) or on one of the seven following weekdays (d=1,...7). The dashed line refers to self-employed spouses while the solid line refers to employed spouses. Source: Labor Force Survey, 2013-2017, Insee.

Appendix B. List of occupations allowed working on public holidays

Code	Label
334a	Officiers des Armées et de la Gendarmerie (sauf officiers généraux)
377a	Cadres de l'hôtellerie et de la restauration
462b	Maîtrise de l'exploitation des magasins de vente
525d	Agents de service hospitaliers (de la fonction publique ou du secteur privé)
554a	Vendeurs en alimentation
554d	Vendeurs du commerce de fleurs
554j	Pompistes et gérants de station-service (salariés ou mandataires)
554h	Vendeurs de tabac, presse et articles divers
563b	Aides à domicile, aides ménagères, travailleuses familiales
642a	Conducteurs de taxi (salariés)
676d	Agents non qualifiés des services d'exploitation des transports
389.	Ingénieurs et cadres techniques de l'exploitation des transports
	Officiers et cadres navigants techniques et commerciaux de l'aviation civile
	Officiers et cadres navigants techniques de la marine marchande
431.	Cadres infirmiers et assimilés
	Infirmiers psychiatriques
	Puéricultrices
	Infirmiers spécialisés (autres qu'infirmiers psychiatriques et puéricultrices)
	Sages-femmes (libérales ou salariées)
	Infirmiers en soins généraux, salariés
	Infirmiers libéraux
468.	Maîtrise de restauration : salle et service
	Maîtrise de l'hébergement : hall et étages
488.	Maîtrise de restauration : cuisine/production
	Maîtrise de restauration : gestion d'établissement
452.	Inspecteurs et officiers de police
	Adjudants-chefs, adjudants et sous-officiers de rang supérieur de l'Armée et de la Gendarmerie
526.	Aides-soignants (de la fonction publique ou du secteur privé)
	Assistants dentaires, médicaux et vétérinaires, aides de techniciens médicaux
	Auxiliaires de puériculture
	Aides médico-psychologiques
	Ambulanciers salariés (du secteur public ou du secteur privé)
546.	Contrôleurs des transports (personnels roulants)
	Agents des services commerciaux des transports de voyageurs et du tourisme
	Employés administratifs d'exploitation des transports de marchandises
	Hôtesses de l'air et stewards
	Autres agents et hôtesses d'accompagnement (transports, tourisme)
561.	Serveurs, commis de restaurant, garçons (bar, brasserie, café ou restaurant)
	Aides de cuisine, apprentis de cuisine et employés polyvalents de la restauration
	Employés de l'hôtellerie : réception et hall
	Employés d'étage et employés polyvalents de l'hôtellerie
636.	Bouchers (sauf industrie de la viande)
	Charcutiers (sauf industrie de la viande)
	Boulangers, pâtissiers (sauf activité industrielle)
	Cuisiniers et commis de cuisine
655.	Autres agents et ouvriers qualifiés (sédentaires) des services d'exploitation des transports
656.	Matelots de la marine marchande, capitaines et matelots timoniers de la navigation fluviale (salariés)

Code	Label
683.	Apprentis boulangers, bouchers, charcutiers
691.	Conducteurs d'engin agricole ou forestier
	Ouvriers de l'élevage
	Ouvriers du maraîchage ou de l'horticulture
	Ouvriers de la viticulture ou de l'arboriculture fruitière
	Ouvriers agricoles sans spécialisation particulière
	Ouvriers de l'exploitation forestière ou de la sylviculture
44..	Clergé, religieux
53..	Policiers et militaires