Following the Crowd: Leisure Complementarities

Beyond the Household[¶]

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Abstract: Leisure externalities across households have important implications for labor market regulations, but have proven very difficult to identify. This paper exploits the unique features of school holidays and paid leave regulations in France to show that exogenous increases in the amount of leisure time enjoyed by workers living with children induce very significant increases in the demand for leisure of workers living in other households. We also provide evidence that these cross effects are driven by complementarities in non-market-time rather than workplace norms or workplace externalities.

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I. Introduction

Social interactions among economic agents and their influence on market behaviors have long been regarded as a central issue in the economic literature[1]. In particular, it has long been recognized that the existence of interdependencies in individual preferences regarding work and leisure may have major labor supply effects as well as deep welfare implications[2]. When an individual's demand for leisure depends on that of others, a local reduction in hours worked in some specific industries or occupations can lead to an economy-wide decrease in aggregate labor supply. Externalities in time use decisions may also have important implications for the role of unions and regulations. When individuals derive utility from synchronizing their work and leisure activities with those of others, societies which impose a higher degree of coordination in market and non-market activities may find themselves better off in aggregate.

Despite the potential importance of leisure externalities, there is still little evidence on their actual magnitude. In particular, there are very few economic studies on whether the time use decisions of an individual are affected by those of individuals living in *other* households. Progress in these directions has been impaired by the difficulty of identifying independent variation in time use decisions for specific groups of households, in specific areas, as households living in the same area are typically exposed to the same seasonal variation in the determinants of work and leisure activities. Also, households living in the same economic area are generally constrained by the same working time regulations and the same local labor demand shocks. In such a context, they tend to enjoy similar amounts

[1]See for example Veblen (1899), Duesenberry (1949), Becker (1974), Pollak (1976), Schelling (1978), Franck (1984), Becker and Murphy (2000), Glaeser et al. (2003).
[2]For example, see Hamermesh (1975), Blomquist (1993), Woittiez and Kapteyn (1998), Grodner and Kniesner (2006), Azariadis et al. (2013).

of leisure at about the same time (e.g. Christmas period), but it does not follow that they find it more pleasurable to engage in leisure time at the same time as everybody else.

In this paper, we exploit the unique features of school holidays and paid leave regulations in France to overcome these issues. In this country, there are two weeks of school holidays in the winter season (typically in February) and two weeks in the spring season (April), but the exact weeks change constantly across regions and over years according to a deterministic rule. Hence, for any region and any given week of February or April, we observe a quasi-random alternation of years where the week under consideration falls within or outside school holidays. It provides us with a unique tool for assessing how exogenous changes in the timing of work and leisure activities of individuals living with school-age children affect those of other individuals, either in the same region or in more distant ones.

French workers are entitled to a legal minimum of five weeks of paid leave per year during which they are granted the same wage as when they work. The dates of paid leave can be imposed by employers for the summer period only (May-October), but not for the spring and winter periods on which we focus. In this context, employees who live with school-age children have obvious incentives to adapt the dates of their spring and winter paid leave from one year to the other so as to be off during school holidays. Our basic research question is whether this induces other individuals to modify the timing of their own work and leisure activities[3].

Using the recent French Labor Force Surveys (LFS), we first confirm the existence of very significant first-stage effects of school holidays on the demand for non-market time of

[3]Generally speaking, this paper takes advantage of the fact that a "treatment" (school holidays) is quasi randomly assigned to a predetermined subgroup of subjects (parents). A growing body of studies uses such a "partial population design" (Moffitt, 2001) to identify externalities, see for example the recent contributions by Lalive et al. (2015), Mogstad et al. (2014), Avvisati et al. (2014) or Johnsen and Vaage (2015).

employees with school-age children: for any given week of February or April, the proportion taking a week off is on average three times larger in regions and years when the week under consideration happens to fall within a school break (from 8% to 25%). During school holidays, parents are faced with an obvious childcare issue and taking paid leave is the simplest and cheapest way to solve the problem. But when looking at workers who do not live with children, we also detect very significant effects of school holidays. For any given week of February or April, the proportion taking a week off is about 50% higher in regions and years when the week under consideration happens to fall within a school break (from 10% to 15%). From one year to the other, many employees living without children adapt the dates of their paid leave so as to be off at the same time as other workers.

When we further focus on the sample of workers who do not live and work in the same education region (commuters), we find that changes in the timing of paid leave are mostly driven by changes in the dates of school breaks in the region of residence, not by those in the region of work. Building on a survey on vacation trips conducted by the French statistical office, we also find that workers living without children (be they commuters or not) keep on going away on holidays during school breaks even after they retire, that is, even after they stop being exposed to workplace interactions. The response of individuals living without children to changes in the dates of school breaks does not seem to be driven by employers, nor by workplace externalities, but by non-market time being more pleasurable when enjoyed at the same time as others.

For individuals aged 50 or more, part of the explanation likely lies in their having grand-children and in their desire to help take care of these grand-children whenever needed. Using the French Time Use Surveys, we show that for workers without children aged 50 or more, childcare actually accounts for about 60% of the rise in days off during school

holidays, consistent with a grand-parent effect. By contrast for workers aged below 50, childcare plays no role and school holidays mainly induce an increase in days off comprising social time with friends and relatives from other households. The demand for synchronization of employees living without children below age 50 seems mostly driven by leisure time being more fulfilling when spent with other adults.

Finally, using school holidays as a source of identification, we provide an instrumental variable (IV) estimate of the cross effect of the amount of leisure time enjoyed by workers living with children on the demand for leisure time of workers living without children. Our IV estimates suggest that a 10 percentage point increase in the proportion of individuals taking a week off among parents living in a region causes a 3.0 percentage point increase in the proportion of individuals taking a week off among people living without children in the same region. Such positive cross effects are consistent with labor supply models that incorporate very significant conformity effects in utility.

There exists a long standing literature on interdependencies in preferences regarding work and leisure. On the empirical side, several studies have documented that individuals living in different households, but endowed with similar characteristics (or living in close proximity) tend to make similar labor supply decisions[4]. However, there is only very limited evidence on whether these similarities involve an actual synchronization of work and leisure activities as well as on whether they reflect actual externalities in time use or unobserved "correlated" effects (Manski, 1993). Our contribution to this literature is threefold. Because we are able to build on year-to-year quasi-experimental variations in the timing of school holidays, we can provide evidence on externalities in time use that cannot be confounded by

[4]See e.g. Aronsson and Palme (1998), Weinberg et al. (2004), Jenkins and Osberg (2005), Maurin and Moschion (2009). Hamermesh et al. (2008) provide evidence on leisure synchronization across time zones in the US. There is also a literature on spillovers in education among different households (see Bobonis and Finan, 2009).

any unobserved seasonal or "correlated" effects. Second, because we also observe exogenous variation in holiday regulations across regions, we are able to separately identify the effects of both within-region and cross-region externalities. In particular, we can explore the relative importance of residential externalities (i.e., across people living in the same place) and workplace externalities (i.e., across people working in the same place). Third, because we are able to look at a labor supply margin that involves very little adjustment costs, we can provide estimates for cross-effects on labor supply that are likely not mitigated by optimization frictions. We show that such unmitigated cross-effects can easily be interpreted in terms of utility parameters, which is essential for any welfare analysis. Had we focused on margins that employees have little leeway to adjust freely (such as the length of the workweek), we would likely have identified much weaker cross-effects, with looser connections to preference parameters[5].

The paper is organized as follows. Sections II and III describe the French regulations and the data used. Section IV provides graphical evidence on how employees adapt the timing of their paid leave to changes in the timing of school breaks. Sections V, VI and VII develop an in-depth regression analysis of the effects of school breaks on the time use decisions of employees as well as on those of retired workers. Finally, Section VIII builds on a labor supply model with social interactions to provide an instrumental variable estimate of a parameter capturing employees' taste for synchronization.

II. Institutional Context

[5]In a recent contribution, Goux et al. (2014) find that exogenous shifts in the length of the workweek of an individual produces cross effects on the non-usual component of her spouse's workweek, but not on the usual component, which is typically specified in the employment contract and much more costly to adjust over time. For an analysis on how frictions may affect labor supply responses, see Chetty et al. (2011) or Chetty (2012).

A. School Holidays

In France, the school year begins in September. There are ten days of school break at the end of October (All Saints), two weeks at the end of December (Christmas), two weeks as winter break (February), two weeks as spring break (April) and two months as summer break (July-August). The dates of these breaks are the same for all public schools all over the country, except for the winter break and the spring break. Specifically, the country is divided into three education regions (*A*, *B* and *C*, designed so as to split the population evenly) and holidays dates are shifted by one week across regions[6]. Furthermore the order in which education regions go into holidays changes every year according to a deterministic rule: if on year *t* the first region is *A* (for weeks *w* and *w*+1), the second region *B* (weeks *w*+1 and *w*+2) and the third region *C* (weeks *w*+2 and *w*+3), then on year *t*+1, the order will be *C*, *A*, *B*, whereas on year *t*+2 it will be *B*, *C*, *A* (see Figure 1). In addition, the starting week for the first region may itself be shifted by one week from one year to another. Specifically, the first winter break starts either on week 6 or on week 7 whereas the first spring break starts either on week 14 or week 15. The exact dates of the different school breaks in the different education regions are set several years in advance.

In this set up, for any region of residence *z* (*z*=*A*, *B* or *C*) and any given week *w,* there are four possible cases, namely cases where *z* only is on school holidays during *w*, cases where both *z* and another region -*z* are on school holidays, cases where one or two other regions only are on school holidays and cases where no region is on school holidays. For weeks 6 to 10 (winter period) and weeks 14 to 18 (spring period), the regulation entails

[6]A map of education regions is shown at http://www.cartesfrance.fr/geographie/cartes-administratives/carte-vacances-scolaires.html.

mechanical alternations of these different cases. The mapping between the different weeks of the year and the different types of alternations is given in Table A1 in the online appendix.

These continual permutations provide a unique instrument for separate identification of seasonal effects and school holiday effects on workers' behavior. Historically, the tourism industry obtained the introduction of this mechanism in 1964. The idea was to minimize the risk that a single week of bad weather could threaten the entire winter sport season.

B. Paid Leave

French labor laws stipulate that employees are entitled with a minimum of five weeks of paid leave per year. The minimum requirement for paid vacation in France is actually similar to those observed in many other developed countries (such as Germany or the UK), but much more generous than in the US, which is the only developed country where employers are not required to provide paid leave (see Ray et al., 2013).

Each year, employees earn 1/12 of their annual right each month. They have to take the weeks of paid leave they earn during year *t* before the end of year *t+1*. The law specifies that a minimum of 2 weeks must be taken during the summer period (May-October) and that, conversely, a minimum of 1 week can be taken either within or outside the summer period depending on employees' needs. Historically, by imposing a minimum of weeks of paid leave during summer, the legislation aimed at guaranteeing all workers a minimum amount of vacation during the "good" season.

With respect to timing, the law stipulates that the exact dates of paid leave can be imposed by employers only for weeks taken during the summer period (May-October), but not for weeks taken outside the summer period (November-April). Given our focus on winter and spring breaks (i.e., outside the summer period), this aspect of the regulation is important: an increase in paid leave during winter or spring breaks cannot be interpreted as

reflecting constraints imposed by employers. Before 1982, workers were entitled to four weeks of paid leave and employers could require workers to take all of them during summer. A fifth week was granted to employees in 1982 by the newly elected socialist government, which also introduced the possibility for workers to take this additional week of paid leave whenever they needed to.

In this context, the only possible influence of employers is to limit the ability of non-parents to take vacation leave during school breaks, at the same time as parents. In case too many employees want to take a paid leave at the same time, employers are indeed allowed to ask some of them to change the dates of their leave and the law requires that priority should be given to those with children. Among workers with similar family responsibilities, priority should be given to the more senior workers. In a number of firms, employees are also entitled to additional weeks of paid leave (on top of the legal minimum). This is especially the case in public sector organizations. In most cases, employees can take these additional weeks whenever they want. Finally, it should be emphasized that, during a paid leave, employees are granted the same wages as when they work. They cannot carry out paid work during periods of paid leave. Also, the right to annual paid leave cannot be given up in exchange for monetary compensation. There is no income effect associated with the timing of annual leave.

III. Data

A. Labor Force Surveys

We first use data from the French Labor Force Surveys (LFS), conducted by the French National statistical office (INSEE) between 2003 and 2011. The LFS is conducted each quarter

over a representative sample of about 37,000 households. The sample was increased in the course of 2009 to reach about 55,000 households per quarter in 2010 and 2011. Observations are uniformly distributed over the weeks of the quarters[7]. Our analysis is based on the subsample of observations between week 2 and week 25 of the year. This set of weeks encompasses winter and spring school breaks, but excludes all the other school breaks, namely all those that are not shifted across regions.

For each household member aged 15 or above, the survey provides information on the place of residence, the place of work[8], age, marital status, level of education and employment status. For employed individuals, we have information on occupation, industry, private/public sector, seniority level as well as on the actual weekly hours worked. Information on earnings is also available for one third of the sample. Our main sample consists of wage-earners who do not work in education and whose spouse, if any, does not work in education. We also exclude individuals with two months or less of seniority since they are not yet entitled to a full week of paid leave. We focus on workers who live in households where there is either no children (of any age, *N*=175,660) or at least one school age child, i.e. aged between 6 and 17 (*N*=161,760). Table A2 in the online appendix confirms that the number of observations per week as well as the basic demographic characteristics of respondents are balanced across school holidays weeks and non school holidays weeks.

Table A3 in the online appendix provides additional information on the subsample of workers who do not work and live in the same education region. In the next section, we

[7] For individuals in the sampling frame that have to be interviewed about week *w*, the interview can take place within two weeks and two days from *w* so that appointments can be made even when *w* falls within (or just before) a period where respondents take a week off and go away on vacation.

[8]France is divided into 22 administrative regions and we have information on the administrative region of work as well as on the administrative region of residence. Since each education region *A*, *B* or *C* corresponds to a specific subset of administrative regions, information on education region of residence (or work) can be directly recovered from available information on administrative region of residence (or work).

build on this subsample to explore the relative importance of interactions within and outside the workplace. As it turns out, a majority of these commuters work in large urban agglomerations but live in one of the less urban local districts (*departments*) that surround these agglomerations. For example, about 33% of commuters work in the Parisian region (education region *A*) but live in one of the districts surrounding the Parisian region (typically in education region *B*). The key question will be whether they are more responsive to school holidays in their region of residence or to school holidays in their region of work, which is also the region where most of their co-workers live[9].

B. Survey on Vacation Trips

We also use the Survey on Vacation Trips, conducted in October 2004 by the French statistical office over a representative sample of about 6,000 households. For each household member, the survey provides information on demographic characteristics as well as on vacation trips taken between October 2003 and September 2004. For each trip lasting four days or more, respondents are asked to provide the exact dates of the trip. We built a database indicating for each respondent and each week between week 2 and week 25 whether a vacation trip (of four days or more) was taken. We exclude individuals who work in education or whose spouse works in education. This database provides weekly information on vacation trips for 3,150 non-teacher employees (1,679 with a child aged 6-17 and 1,471 who do not live with children), 2,387 retired workers.

C. Time Use Surveys

Finally, we use the two last Time Use Surveys (TUS) conducted by the statistical office, in 1999 and 2010. The 1999 (2010) survey was conducted on a representative sample of about

[9] The LFS provides the employer's identification number for over 80% of respondents. For about half of them, one co-worker happens to be a LFS respondent too. Building on this information, we checked that about 80% of commuters' co-workers are actually non-commuters.

12,000 households (10,000 households). In 1999, the survey provides information on the time use decisions of all the household's members whereas in 2010 it provides information on one (randomly chosen) household's member and her spouse (if any).

Each respondent describes how she spends her time during a given random day, by interval of time of ten minutes. The survey provides information on the amount of time spent working, sleeping, eating, watching TV, home working, travelling, spending time with children[10], taking meals with people from other households, exercising etc. The detailed classification of daily activities includes about 140 items. The surveys also include basic characteristics of respondents, such as gender, age, household composition and employment status. The survey consists in several waves of interviewing which are designed so as to obtain a distribution of observations over the days of the year that is as close as possible to uniform. Each observation involves two face-to-face interviews, one just before and one just after the day that is described by the respondent.

Our main TUS sample consists of wage earners who do not work in education and whose spouse, if any, does not work in education. We focus again on observations that correspond to weeks 2 to 25 and we exclude those that correspond to weekends. Also we focus on either individuals without children living in the household (*N*=1,873) or individuals living in household with at least one school age child (i.e. aged 6 to 17, *N*=1,640). Table A4 in the online appendix confirms that the number of observations per week as well as the basic demographic characteristics of respondents are balanced across school holidays weeks and non school holidays weeks.

[10] The most detailed classification includes several elementary activities related to children. Specifically, it distinguishes "playing with children" or "educating children" from "providing care to children" or "driving children". It also indicates whether these activities are undertaken with children living in another household or in the same household. For the sake of simplicity, we built one single activity ("time spent with children") from all these elementary ones. As discussed below, workers without children in their households spent actually very little time in these different activities, both during and outside school holidays.

IV. School Holidays and Weeks Off: Graphical Evidence

Before moving on to the econometric analysis, we provide a simple graphical analysis of the direct and indirect effects of school holidays on workers' demand for non-market time. To start with, Figure 2 focuses on workers living with school age children and plots the proportion taking a week off (i.e. number of weekly hours worked=0) for weeks *w*=2 to 25. For weeks *w*=6 to 10 or weeks *w*=14 to 18, the top line refers to observations made when *w* actually falls within school holidays in the region of residence whereas the bottom line refers to observations made when *w* falls outside school holidays in the region of residence. For these two subsets of weeks, the gap between the two lines provides direct evidence on the average effect of school holidays in the region of residence on the proportion of employees taking a week off. As it turns out, the Figure reveals that the proportion of employees with school-age children who do not work is about three times higher when these specific weeks fall within school holidays than when they fall outside school holidays (25% versus 8%). This finding confirms that school holidays in a region have a very strong impact on the demand for non-market time of employees with school age children living in this region.

Figure 3 replicates this graphical analysis on the sample of employees living without children. It reveals very similar variations in their propensity to take a week off. The proportion who do not work during weeks 6 to 10 (or 14 to 18) is actually about 5 percentage points higher when these weeks fall within school holidays in the region of residence (top line) than when they fall outside school holidays in the region of residence (bottom line). This result is clearly consistent with the assumption that, from one year to the other, employees living without children adapt the timing of their weeks of paid leave so as to be off at the same time as employees living with children in the same region.

V. School Holidays and Weeks Off: Regression Analysis

The graphical evidence presented in the previous section suggests that employees without children living in the household seek to synchronize their work and leisure activities with those of other individuals living in the same region. In this section, we develop a simple regression analysis to test the robustness of this finding as well as to look at whether these positive interactions between employees living in the same region get amplified by interactions across employees living in different regions. We also provide a separate analysis of workers who do not live and work in the same region, so as to analyse the relative importance of interactions in the workplace and interactions outside the workplace.

A. School Holidays and the Probability to Take a Week Off

For worker *i* living in region *z* in year *t*, we denote Y_{iwzt} a variable indicating that *i* did not work during the *w*-th week of the year (*w*=2,…,25) and our basic regression model is,

$$(1) \qquad Y_{iwzt} = \alpha S_{wzt} + \beta S_{w\text{-}zt} + X_{iwzt}\theta + \varepsilon_{iwzt},$$

where S_{wzt} is a dummy indicating school holidays in region *z* during week *w* and year *t*, $S_{w\text{-}zt}$ a dummy indicating school holidays during the same year and the same week in at least one other region. The variable X_{iwzt} represents a set of controls which includes a full set of week fixed effects, region fixed effects and year fixed effects. The ε_{iwzt} random error is assumed exogenous to the timing of school holidays[11]. Parameter α measures the effect of school holidays in the region of residence whereas parameter β represents the effect of school holidays outside the region of residence. These parameters are identified through the

[11]Given that we focus on a dichotomous dependent variable, we could have chosen a logistic (or probit) specification instead of a linear probability one. We checked that the estimated effects that are significant at standard levels are exactly the same with the two specifications. The two models generate predicted probabilities of taking a week off that are highly correlated (the correlation coefficient is about .98).

arbitrary changes in the time schedule of school holidays over time and across regions described in section II.

The first two columns of Table 1 show the results of model (1) when we focus on workers who live with school age children. They confirm that these workers are much more likely to take a week off during school holidays in their region of residence (18.5 percentage point increase). By contrast, there is no evidence of significant cross-region effects for these workers: the probability that workers with school-age children take a week off in a given region is not impacted by school holidays in other regions. This result confirms that most parents have only little leeway to take a vacation leave outside periods of school holiday in their region of residence. The second column shows that these estimates are robust to the introduction of the control variables, confirming that the timing of school holidays is unrelated to the distribution of workers' characteristics across regions and over time.

The last two columns of Table 1 replicate this regression analysis for workers without children (of any age) in their households[12]. They show that the probability of their not working during a given week is about 5.4 percentage points higher when this week falls during school holidays, which corresponds to about a 50% increase in the proportion taking a week off during school holidays. They also reveal that individuals living without children tend to take slightly more weeks off when other regions are on school holidays than when no other region is on school holidays, but that this cross-region interaction (1.4 percentage points) is much weaker than the within-region one. The increase in the demand for paid leave of individuals who do not live with children is mostly driven by school breaks in their

[12]Let us emphasize that this sample excludes not only employees who live with children aged 6-17, but also those with children below age 6. We exclude them from our spillover analysis because they may be directly affected by school breaks. Many children below age 6 attend pre-elementary school. It is not compulsory, but the school breaks are the same as in elementary school. In the online appendix, Figures A1 and A2 show the effects on employees living with children by age of children. As expected, effects for the 0-6 age group are significant, but weaker than for the 6-17 age group.

region of residence, not by school breaks in any region. It is suggestive that their basic motivation is not to take holidays during peak periods, when there are more people in winter sports resorts, but simply to stay synchronized with people from their region.

Tables A5 and A6 in the online appendix show the results of replicating this regression analysis for various subgroups of workers without children in the household (defined by gender, age, industry, etc.). Generally speaking, these investigations confirm that the effects of school holidays on weeks off are significant for all types of workers, regardless of gender, age, etc. Effects tend to be even more significant in public sector industries, namely in industries where a large fraction of workers are entitled to more than five weeks of annual paid leave and are less constrained about the number of weeks of paid leave they can take during the non-summer period.

B. Interactions in the Workplace vs Interactions outside the Workplace

Our basic regression results confirm that workers living without children tend to adapt their dates of paid leave from one year to the other so as to be off at the same time as workers with children in their region. Such a demand for synchronization may be driven by non-market time being more pleasurable when enjoyed at the same time as others. But it may also be driven by workplace externalities. For example, working time may become more painful when more co-workers are absent. More in general, workplace norms may be such that people find it difficult to be on holidays when colleagues are at work.

To explore this issue, we replicated our regression analysis on the subsample of workers who do not live and work in the same education region. For these commuters, it is possible to separately identify the effect of school holidays in the region where they live, the effect of school holidays in the region where they work as well as the effect of school holidays in the region where they do not live nor work. Assuming that workplace pressure

plays a dominant role, commuters should be mostly responsive to school breaks in the education region where they work and where the vast majority of their co-workers live.

As shown in Table 2, this analysis first confirms that cross-region commuters with school-age children mostly respond to school holidays in their region of residence, not to school holidays in the other regions. Specifically, school holidays in their region of residence is associated with an average increase of about 16.3 percentage points in their probability to take a week off whereas school holidays in other regions (including the region of work) have negligible effects on their probability to take a week off. These results are very similar to those obtained on the full sample and hold regardless of whether we include a full set of control variables or not. They are clearly suggestive that commuters with children are mostly responsive to school breaks that determine their children's holidays, not those that affect the demand for leisure of their co-workers.

Given these facts, the next question becomes whether cross-region commuters living without children get affected by the same specific school breaks as commuters living with school-age children. The last two columns of Table 2 reveal that this is the case. Specifically, school holidays in the region of residence of cross-region commuters living without children are associated with a significant increase of about 4.3 percentage points in their probability to take a week off whereas the effects of school holidays in their region of work or in the other region are much weaker and not statistically significant[13]. Again these regression results are similar to those obtained on the full sample and hold regardless of whether we include a full set of control variables or not. They provide us with clear evidence that

[13] We checked that the difference between the estimated effect of school holidays in the region of residence and the estimated effect of school holidays in the region of work is significant at the 5% level. We also checked that we obtain similar regression results (i.e., significant positive effect of school holidays in region of residence and no effect of school holidays in region of work) when we further restrict our sample to commuters who live alone and are not likely to be influenced by non-commuting spouses.

commuters living without children seek to synchronize their activities with people in their region of residence (be they commuters or not), not with their coworkers. Overall our results are consistent with the assumption that workplace externalities play but a minor role in the decision to take a paid leave, even though we should keep in mind that these results may be specific to the sample of commuters[14]. In the next section, we provide further evidence on this issue by showing that employees (be they commuters or not) keep on taking holidays at the same time as everybody else, namely during school holidays, even after they retire.

VI. School Holidays and Vacation Trips

As shown in the previous section, employees living without children adapt the dates of their paid leave from one year to the other, so as to be off during school breaks, at the same time as families with school age children. Several different reasons might explain their behavior. It may be that they want to stay synchronized with families living in their region (be they friends or relatives), so as to be able to spend more time with them, or to help them take care of their children whenever they need it. But it could also be that they want to avoid working and staying at home when not all local shops are opened[15]. The influence of parents' behavior on non-parents' behavior would then not be direct, but indirect, through its impact on the behavior of small business owners. In this case, however, school breaks would be mostly associated with a rise in the proportion of individuals without children

[14]It should be emphasized that the sample of commuters is limited and that the results of this analysis do not necessarily apply to non-commuters. There is no clear reason, however, to believe that commuters are less constrained by workplace norms than non-commuters. Commuters are more often working in the private sector, which is typically much less flexible on when people can take vacation time than the public sector.

[15]When we replicate our analysis on workers identified as business owners (shopkeepers, small craftsmen, etc.), we find that the proportion taking a week off increases during winter and spring breaks (8% vs 5% outside school breaks), although to a much lesser extent than during summer holidays (31% in August).

going away on vacation, not with a rise in the proportion taking vacation at home. To test this assumption, this section builds on the survey on vacation trips conducted by the French Statistical Office in 2004. It allows us to identify the effect of school breaks on the probability to go away on holidays for a representative sample of individuals.

A. School Holidays and Employed Workers' Vacation Trips

For each respondent *i* and each week *w* (w=2,…25), the survey on vacation trips makes it possible to construct a dummy indicating whether *i* took a vacation trip during *w*. Table 3 shows the results of regressing this variable on a dummy indicating school holidays in the region of residence of *i* during *w* and a dummy indicating school holidays in at least one other region, using the same regression model as model (1)[16]. We analyze separately employees living with school age children (panel A) and employees living without children (panel B). We provide the regression results based on the full samples (column 1) as well as on the subsamples defined by households' income level (columns 2 to 4).

The Table first shows that school holidays in a region have a significant impact on the demand for vacation trips of employees living in this region. But the Table also reveals that this impact of vacation trips only accounts for a relatively small part of the overall impact of school breaks on the probability to take a week off. Specifically, school breaks in a region induce an increase in the proportion of residents going away on holidays which is about 7.2 percentage points for employees living with school age children and 1.8 percentage points for employees living without children which represents only about 30% of the overall effects

[16]Building on the longitudinal dimension of the survey on vacation trips, we can control for both a full set of week fixed effects and a full set of individual fixed effects. Identification comes from variation across consecutive weeks in the differences in outcomes across education regions.

of school breaks on the probability to take a week off as estimated with the LFS[17]. School breaks are associated with an increase in all forms of leisure time, even those involving significant accommodation and transportation costs, but the main effect of school breaks is on vacation at home, not on vacation trips. It can hardly be interpreted as a response to the temporary closing of some local shops.

The Table provides additional regression results showing that in fact the effect of school breaks on vacation trips is significant for employees without children in high-income households only. For those living in low-income and middle-income households, school breaks induce almost exclusively a rise in vacation at home[18]. In Online Appendix B, we provide evidence that school holidays are associated with very significant increases in holiday rentals' prices as well as in transportation costs (see Figures B1 and B2). These price effects likely contribute to mitigating the effects of school holidays on the demand for vacation trips, especially for low-income and middle-income earners.

The demand for vacation trips of employees living without children in a region is also positively affected by school holidays in *other* regions (0.7 percentage points), but this cross-region effect is much smaller in magnitude and not statistically significant. This smaller cross-region effect confirms that employees living without children are only weakly affected by winter sport and vacation resorts becoming more attractive during peak periods. Their demand for vacation trips is only weakly responsive to the jumps in ski resorts' attendance observed when any education region is on holidays. Overall, this is consistent with the idea

[17] We checked that when we replicate the LFS analysis on the sole 2004 LFS sample we get estimates of school breaks 'effects that are very similar to those obtained with the full sample in Table 1, and namely 19.7 percentage points for employees with children and 6.3 percentage points for employees without children.

[18] As shown in Table A6 in the online appendix, when we replicate our basic LFS analysis by income groups, we find that the impact of school breaks on the proportion of employees without children who take a week off is even more significant on the low income and middle income groups than on the high income one.

that employees living without children do not primarily try to stay synchronized with local shops or vacation resorts' attendance, but with families living in their region.

B. School Holidays and Retired Workers

Taken together, the LFS and the survey on vacation trips suggest that many employees living without children want to be off during school holidays, at the same time as the other employees living in their region, either to take vacation at home or vacation trips, depending on their income. The previous sections have also provided evidence that this behavior is not likely driven by workplace norms or externalities, but by leisure externalities. If this assumption is true, school breaks should keep on affecting workers' demand for vacation trips *after* they retire. This is an important issue: leisure externalities represent one key reason why changes in regulations for prime age workers may affect the labor supply and time use decisions of older individuals at the margin of the labor force.

To investigate this issue, we replicated our analysis of vacation trips on the sample of retired workers[19]. This analysis first reveals that school holidays in a region have an effect on the proportion of residents going away on vacation trip which is as significant for retired workers as for employed workers living without children (see Table 4, panel A). The proportion of retired workers on vacation trips is about 1.9 percentage points higher during school breaks (compared to its average value, it corresponds to a 45% increase in this proportion). We checked that the effects on retired workers are not driven by those whose spouse is still employed: we find almost exactly the same effects when we further focus on retired workers whose spouse is retired (Table 4, panel B). Consistent with previous results for employed workers, regressions by income groups show that school holiday effects on

[19] In this analysis, we dropped the little fraction of retired workers who still live with children.

retired workers are much more significant for high-income retirees (4.7 percentage points) than for middle-income (0.8) or low-income ones (0.4)[20].

Overall, our results are suggestive that the effect of school breaks on vacation trips is as strong for retired workers as for employees living without children, even when we focus on high income households. This result may be driven by the desire to spend time with friends and relatives with children when they are available, namely during school breaks. But it may also reflect the desire to be at home outside school breaks, when these friends and relatives are at home, maybe to be able to help them take care of their children. These complementarities in time use decisions across retired and employed workers represent one basic channel through which policies affecting hours worked and leisure time of employees may eventually affect the welfare of retirees and the labor supply behavior of senior workers.

VII. School Holidays and Social Interactions

The previous sections have shown that employees living without children find not working more valuable during school breaks. These sections have also provided evidence that employees living without children seek primarily to stay synchronized with relatives and friends that have school-age children. One reason may be that they want to be able to spend as much leisure time as possible with them. Another reason may be that they want to be able to help them take care of their children whenever they need it. To test between these

[20] The survey on vacation trips provides information on the type of accommodation used. Further analysis by type of accommodation suggests that the stronger effect on high-income retirees is driven by their higher ability to pay for holiday rentals as well as by their owning holiday homes. In 2010, according to the French statistical office, about 10% of French households own a holiday home, but the proportion is three times higher for high SES than for low SES occupations (i.e., 15% *vs* 5%), where low SES occupations include blue collars and routine clerks and represent about 46% of the population (Kwok, 2010).

hypotheses, we built on the Time Use Surveys (TUS) conducted by the French statistical office in 1999 and 2010. These surveys provide information on whether individuals spend time taking care of children from other households.

Focusing on the same January-June period as in the previous sections, we first used TUS to compare time use diaries collected within and outside periods of school holidays in the region of residence. This comparison confirms that school holidays are associated with an increase in the probability of taking a day off (i.e., no market work at all during the day) which is about 7.5 percentage points for employees living without children. TUS provide us with an evaluation of the effect of school holidays on workers' demand for non-market time that is very similar to that obtained with the Labor Force Surveys.

Time Use Surveys also provide information on whether respondents' time use diaries include at least some elementary intervals of time devoted to taking care (or driving) children, or playing with them. Using this information, it is possible to identify four basic time use diaries depending on whether they include (a) paid work, but no childcare, (b) paid work and some childcare, (c) no paid work and no childcare, (d) no paid work and some childcare. To investigate cross-household externalities that are not mediated by children, we also identified days that do not include paid work nor childcare, but that do include meals taken with people from other households.

Building on this simple classification, Table 5 shows the effect of school holidays in the region of residence on the probability of occurrence of the different types of days using the same basic regression model as in the previous sections. The Table shows that the increase in days off induced by school holidays corresponds to the substitution of both days off without childcare (5.6 percentage points) and days off with some childcare (1.9 percentage points) for workdays without childcare (-7.3 percentage points). This finding is

suggestive that about 25% of the increase in days off induced by school holidays is likely related to childcare issues. When we analyze separately employees living without children below and above age 50, we find that the rise in days off with some childcare is almost exclusively driven by older workers, consistent with a grand-parent effect. For these older workers, childcare accounts for about 60% of the rise in days off during school holidays. By contrast, for workers living without children below age 50, school holidays are mostly associated to the substitution of days off without childcare (6.8 percentage points) for workdays without childcare (-9.4 percentage points). For these workers, the rise in days off during school breaks is not related to parents' demand for childcare. It corresponds to days off that include more friendly and convivial interactions with adults in other households. As shown in Table 5, about 70% of the increase in days off without childcare corresponds to days that include meals with people from other households[21].

VIII. Cross Effects on Leisure Demand: IV estimates and interpretation

The previous sections have highlighted the reduced-form impact of school holidays on the demand for non-market time of employees living without children. In this section, we assume that this reduced-form impact reflects the influence exerted by employees living with children on the time use decisions of other employees, either directly (through social interactions) or indirectly (though price effects). Under this assumption, it is possible to use school holidays as a source of identification for the cross effect of the demand for non-

[21]There are employees who do not have children living in their households, but have children living in other households and have to take care of these children during school breaks. The results in Table 5 suggest that this fact explains at best a small part of the effect of school holidays on employees living without children, especially for those aged below 50. According to a survey on "family history" conducted in 1999 by the French Statistical Office, the proportion of employees living without children who have school age children living in other households is actually not very large (6% of men, 1.5% of women).

market time of employees with children on that of employees living without children. Specifically, we focus on workers living without children and assume the following model,

$$(2) \qquad Y_{iwzt} = \gamma_1 \underline{Y}_{pwzt} + \gamma_2 \underline{Y}_{pw\text{-}zt} + X_{iwzt}\theta + \varepsilon_{iwzt}$$

where, for each week w, region z and year t, Y_{iwzt} indicates that worker i takes a week off whereas $\underline{Y}_{pwzt}$ represents the proportion of workers living with children in region z who take a week off on week w and year t while $\underline{Y}_{pw\text{-}zt}$ represents the proportion of workers living with children in regions $-z$ who take a week off on week w and year t. The X_{iwzt} variable represents controls which include week, year and region fixed effects. The ε_{iwzt} random error is again assumed exogenous to the timing of school holidays.

In Online Appendix C, we develop a social interaction model which captures the main features of the French institutions and helps clarify the theoretical status of parameters γ_1 and γ_2. In this model, an increase in the aggregate number of persons taking a week off may affect own decision Y_{iwzt} either negatively (because it induces a rise in the costs of vacation) or positively (because utility functions include a taste-for-conformity parameter, as in Brock and Durlauf, 1995), so that the sign of cross-effects γ_1 and γ_2 is theoretically ambiguous. Identifying the sign and magnitude of the γs' is important for both positive and normative reasons since these parameters determine how aggregate shifts in labor supply for groups of individuals affect the marginal utility of leisure for other individuals[22].

Table 6 provides an estimation of the contextual effects γ_1 and γ_2 using a dummy variable indicating that region of residence z is on school holidays as well as a variable

[22]As discussed in Online Appendix C, for any shift $\Delta\underline{L}$ in the average amount of leisure enjoyed in a region, $\gamma_1^2\Delta\underline{L}^2$ can be interpreted as a measure of the welfare loss suffered by individuals who cannot adapt their own leisure to that of the other people. The welfare implications of significant cross effects γ_1 and γ_2 are all the more important as employees have little leeway to adjust the timing of their leisure activities to that of others. In France as in most developed countries, adjustments of the work schedules require the agreement of the employer. The only margin on which employees have control is the one on which we focus in this paper, namely the dates of the week of paid leave that has to be taken outside the summer period.

indicating the number of other regions -*z* on school holidays as instrumental variables. The model is estimated after averaging outcomes at the region × year × week level, namely at the very level where contextual effects and instruments are defined. First-stage regressions confirm that school holidays in region of residence *z* are associated with a very significant increase in the proportion of parents living in *z* taking a paid leave whereas school holidays in other regions –z are associated with a very significant increase in the proportion of parents living in –z taking a paid leave. The corresponding IV estimate is about .30 for γ_1 and .13 for γ_2. Both estimates are statistically significant at standard levels. These IV results are suggestive that a 10 percentage point increase in the proportion of employees with children taking holidays in a region generates an increase of about 3.0 percentage points in the proportion of employees without children taking holidays in the region and an increase of about 1.3 percentage points in other regions.

Assuming that cross effects are homogenous (i.e., cross effects of parents on non-parents are similar to those of non-parents on parents), a value of γ=.30 for these cross effects is consistent with a value of about 1.4 for the social multiplier $1/(1-\gamma)$ of labor supply at the region level. This is larger than the social multiplier of about 1.1 recently estimated at the household level by Goux et al. (2014). As speculated by Glaeser et al. (2003), multipliers are likely to rise with the level of aggregation, as they encompass a wider range of social interactions. Another explanation for our relatively strong multiplier effect is that we focus on a labor supply margin that involves little adjustment costs so that our estimates are not likely to be mitigated by very strong optimization frictions. This interpretation would be in line with Chetty (2012) who emphasizes that the impact of tax changes on individual labor

supply can be severely downward biased (especially in the short run) by optimization frictions and adjustment costs[23].

IX. Conclusion

In France, the dates of the winter and spring breaks change continuously from one year to another - as well as from one region to another - according to an exogenous deterministic rule. Building on this unique feature of French regulations, this paper investigates the effect of an increase in the amount of leisure time enjoyed by families living with school age children on the demand for leisure of individuals living in other households, either in the same region or in more distant places.

We first provide evidence that many employees living without children change the timing of their paid leave from one year to another so as to be off at exactly the same time as employees living with school age children, namely during school breaks. We also show that employees who do not work and live in the same education region respond mostly to changes in the dates of school breaks in the region where they live not to those in the region where they work. Cross effects on households' time use choices are very significant and seem to be driven by externalities in non-market time rather than by workplace externalities or workplace norms.

Using a survey on vacation trips, we further show that school holidays lead to a much smaller increase in vacation trips than in vacation taken at home, especially for low-income and middle-income workers. The response of employees living without children to changes in the dates of school breaks does not seem to be motivated by vacation resorts becoming

[23]Chetty (2012) also emphasizes that significant multiplier effects represent one potential explanation for this discrepancy between macro and micro intertemporal (Frisch) labor supply elasticities.

more attractive (nor by local day-to-day life becoming less convenient) during school holidays, but by the desire to stay synchronized with families living in their region. Time use data confirm that most workers change their holidays' dates from one year to the other so as to be able to spend more recreational and leisure time with other adults. Older workers also adjust the timing of their time off to that of school holidays in order to spend more time with children from other households, consistent with a grand-parent effect.

Overall, our paper provides an array of evidence that leisure externalities across households are important, which has implications for most public policies. Many Western countries struggle with persistently low employment rates and consider introducing more flexible regulations such as Sunday work or unrestricted overtime. The idea is to reinvigorate labor markets by increasing individuals' employment opportunities. Our findings suggest that such reforms are also likely to affect individuals' behaviour and wellbeing indirectly, by desynchronizing work schedules and making interactions with others more difficult. The overall outcome could be a gain in overall number of hours worked, but not necessarily a gain in social welfare.

References

Aronsson, Thomas, and Marten Palme. 1998. A Decade of Tax and Benefit Reforms in Sweden: Effects on Labour Supply, Welfare and Inequality. *Economica* 65(257): 39-67.

Avvisati, Francesco, Marc Gurgand, Nina Guyon and Eric Maurin. 2014. Getting Parents Involved: a Field Experiment in Deprived Schools. *Review of Economic Studies* 81(1): 57-83.

Azariadis, Costas, Been-Lon Chen and Yin-Chi Wang. 2013. A Two-sector Model of Endogenous Growth with Leisure Externalities. *Journal of Economic Theory* 148(2): 843-857.

Becker, Gary S. 1974. A Theory of Social Interactions. *Journal of Political Economy* 82: 1063-1094.

Becker, Gary S., and Kevin M. Murphy. 2000. *Social Economics: Market Behavior in a Social Environment*. Harvard University Press.

Blomquist, Sören. 1993. Interdependent behavior and the effect of taxes. *Journal of Public Economics* 51: 211-218.

Bobonis, Gustavo, and Frederico Finan. 2009. Neighborhood Peer Effects in Secondary School Enrollment Decisions. *Review of Economics and Statistics* 91(4): 695-716.

Brock, William A., and Steven N. Durlauf. 1995. Discrete Choice with Social Interactions I: Theory. Working Paper n° 5291, National Bureau of Economic Research, Cambridge, MA.

Chetty, Raj. 2012. Bounds on Elasticities with Optimization Frictions: a Synthesis of Micro and Macro Evidence on Labor Supply. *Econometrica* 80 (3): 969-1018.

Chetty, Raj, John Friedman, Tore Olsen, and Luigi Pistaferri. 2011. Adjustment Costs, Firm Responses, and Micro vs. Macro Labor Supply Elasticities: Evidence from Danish Tax Records. *Quarterly Journal of Economics* 126: 749-804.

Duesenberry, James S. 1949. Income, *Saving and the Theory of Consumer Behavior*. Harvard University Press.

Frank, Robert H. 1984. Are workers paid their marginal products? *American Economic Review* 74: 549-571.

Glaeser, Edward L., Bruce I. Sacerdote and Jose A. Scheinkman. 2003. The Social Multiplier. *Journal of the European Economic Association* 1 (2-3): 345-353.

Goux, Dominique, Eric Maurin and Barbara Petrongolo. 2014. Worktime Regulations and Spousal Labor Supply. *American Economic Review* 104 (1): 252-76.

Grodner, Andrew and Thomas J. Kniesner. 2006. Social Interactions in Labor Supply. *Journal of the European Economic Association* 4 (6): 1226-1248.

Hamermesh, Daniel. 1975. Interdependence in the Labour Market. *Economica* 42 (168): 420-429.

Hamermesh, Daniel, Caitlin Knowles Myers and Mark Pocock. 2008. Cues for Timing and Coordination: Latitude, Letterman, and Longitude. *Journal of Labor Economics* 26(2): 223-246.

Jenkins, Stephen P., and Lars Osberg. 2005. Nobody to play with? : The implications of leisure coordination. In *The Economics of Time Use*, Elsevier, Amsterdam.

Johnsen, Julian V., and Kjell Vaage. 2015. Spouses' Retirement and the Take-Up of Disability Pension. Working Paper, University of Bergen.

Kwok, Patrick. 2010. Cinq millions de ménages multipropriétaires. *Observation et statistiques*, n° 49.

Lalive, Rafael, Camille Landais and Josef Zweimüller. 2015. Market Externalities of Large Unemployment Insurance Extension Programs. *American Economic Review*. 105(12): 3564-96.

Manski, Charles F. 1993. Identification of Endogenous Social Effects: The Reflection Problem. *Review of Economic Studies* 60 (3): 531-542.

Maurin, Eric, and Julie Moschion. 2009. The Social Multiplier and Labor Market Participation of Mothers. *American Economic Journal: Applied Economics* 1 (1): 251-272.

Moffit, Robert. 2001. Policy Interventions, Low-Level Equilibria, and Social Interactions. In *Social Dynamics*, ed. S.N. Durlauf and H.P. Young. MIT Press.

Mogstadt, Magne, Gordon Dahl and Katherine Loken. 2014. Peer Effects in Program Participation. *American Economic Review* 104 (7): 2049-2074.

Pollak, Robert. 1976. Interdependent Preferences. *American Economic Review* 66: 309-320.

Ray, Rebecca, Milla Sanes and John Schmitt. 2013. No-Vacation Nation Revisited. CEPR Research Report.

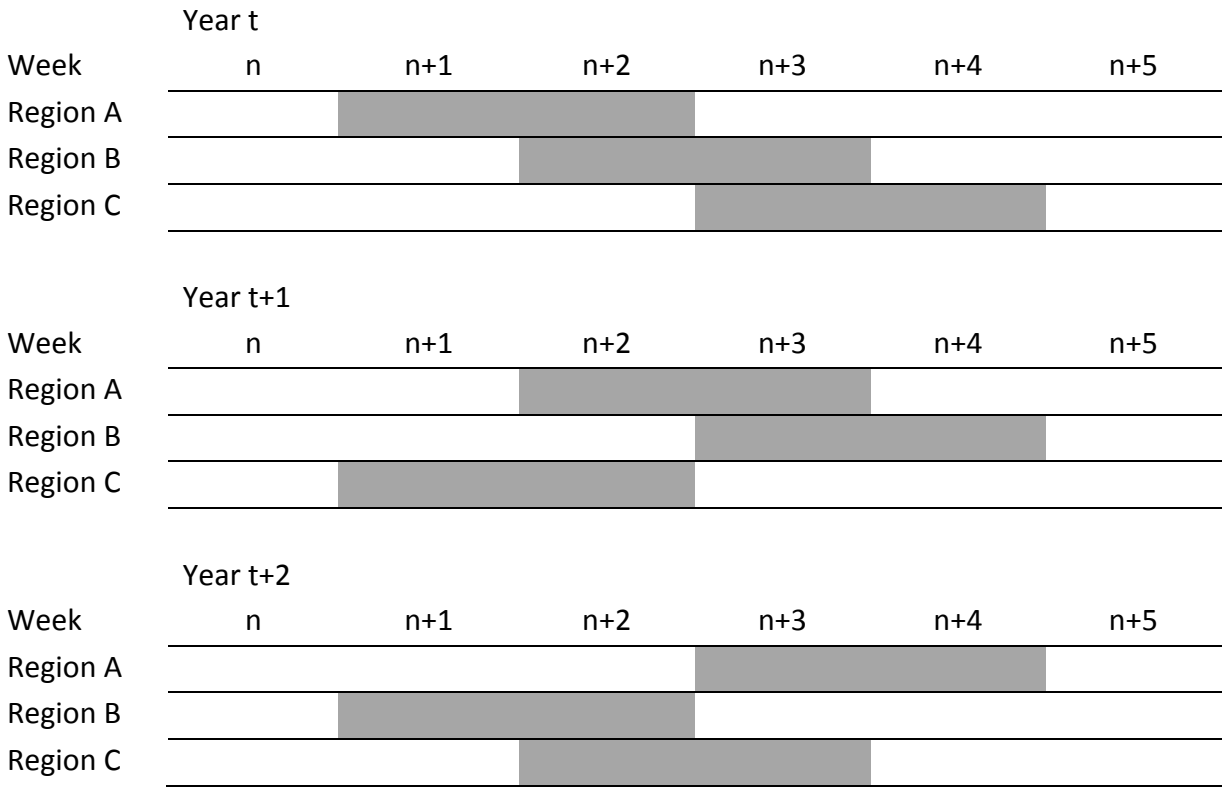
Schelling, Thomas C. 1978. *Micromotives and macrobehavior*. New York: Norton.

Veblen, Thorstein. 1899. *The Theory of Leisure Class: An Economic Study of Institutions*. London: George Allen and Unwin.

Weinberg, Bruce A., Patricia B. Reagan and Jeffrey J. Yankow. 2004. Do Neighborhoods Affect Hours Worked? Evidence from Longitudinal Data. *Journal of Labor Economics* 22 (4): 891-924.

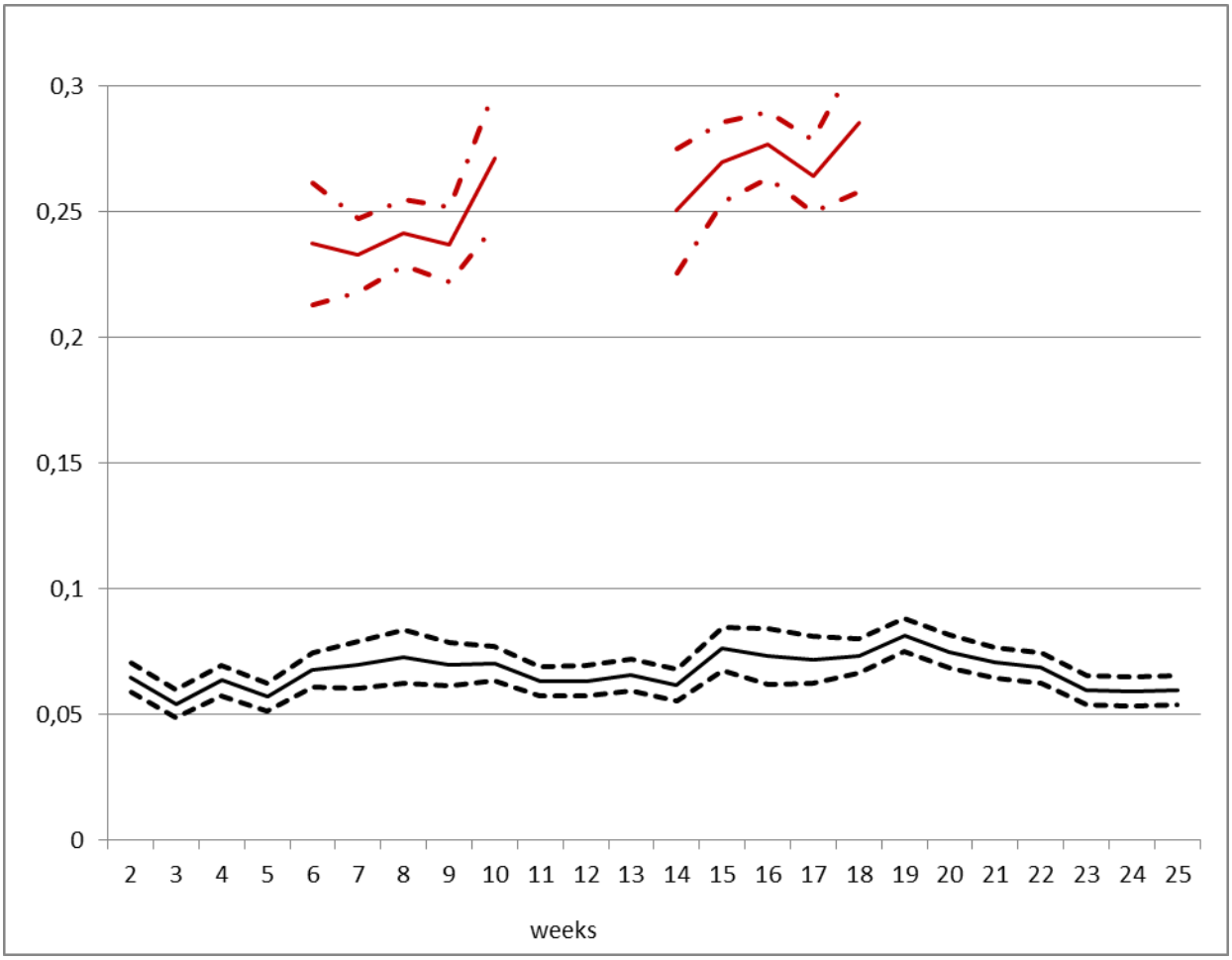
Woittiez, Isolde, and Arie Kapteyn. 1998. Social interactions and habit formation in a model of female labour supply. *Journal of Public Economics* 70 (2): 185-205.

Figure 1 - School holidays regulation in France



Note: for each year and each education region (*A*, *B* or *C*), periods in grey correspond to weeks of school holidays. On year *t*, Region A is on holidays on weeks *n*+1 and *n*+2. On year *t*+1, it is on holidays on weeks *n*+2 and *n*+3.

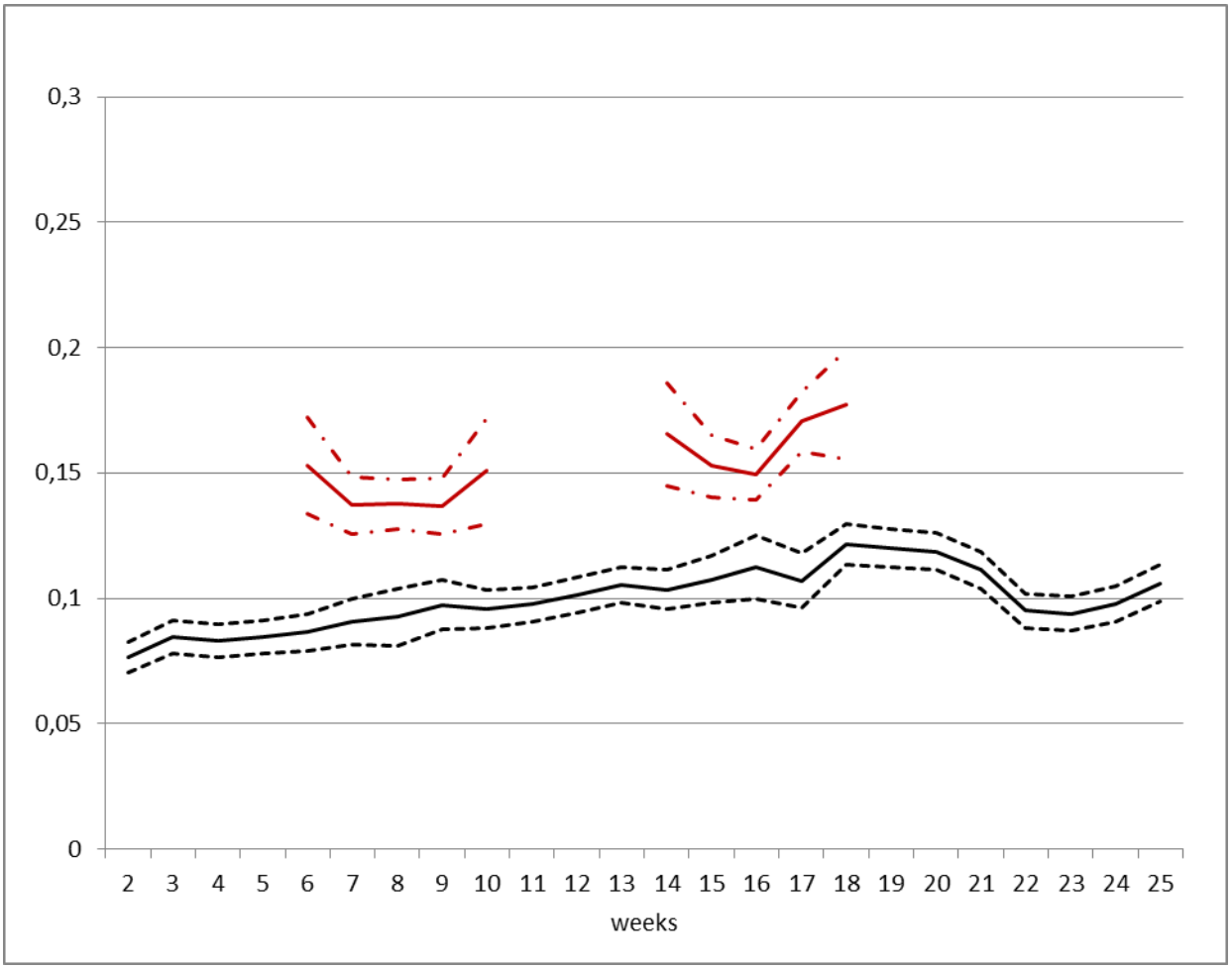
Figure 2 - School holidays and weeks off: employees living with children 6-17



Source: Labor Force Surveys, 2003-2011, INSEE.

Note: For weeks *w* in [2;25], the bottom line shows the proportion of employees living with children 6-17 taking a week off when *w* does not fall within school holidays. For weeks *w* in [6;10] or in [14;18], the top line shows the proportion of employees living with children 6-17 taking a week off when *w* falls within school holidays. For these specific weeks, the gap between top and bottom line captures the effect of school breaks on the proportion of employees with children 6-17 taking a week off.

Figure 3 – School holidays and weeks off: employees living without children



Source: Labor Force Surveys, 2003-2011, INSEE.

Note: For weeks *w* in [2;25], the bottom line shows the proportion of employees living without children taking a week off when *w* does not fall within school holidays. For weeks *w* in [6;10] or in [14;18], the top line shows the proportion of employees living without children taking a week off when *w* falls within school holidays. For these specific weeks, the gap between top and bottom line captures the effect of school breaks on the proportion of employees without children taking a week off.

Table 1 - School holidays and weeks off

	Employees with children 6-17		Employees w/o children	
	(1)	(2)	(3)	(4)
School holidays in region of residence	.185**	.185**	.054**	.054**
	(.004)	(.004)	(.004)	(.004)
School holidays in another region	.001	.001	.014**	.013**
	(.004)	(.004)	(.005)	(.005)
Add. controls	no	yes	no	yes
Obs.	161,760	161,760	175,660	175,660
Mean dep. var.	.098	.098	.108	.108

Source: Labor Force Surveys, 2003-2011, INSEE.

Note: The sample includes employees observed between weeks 2 and 25, excluding those who work in education (or whose spouse, if any, works in education) as well as those with two or less months of seniority. Columns (1) and (2) refer to the subsample living with children aged 6-17 whereas columns (3) and (4) refer to the subsample living without children. The table shows the results from reduced-form regressions in which a dummy indicating that a worker takes a week off during week *w*, in year *t* and region *z* is regressed on a dummy indicating that *w* corresponds to school holidays in *z* and *t*, a dummy indicating that *w* corresponds to school holidays in another region in year *t.* Control variables in columns 1 and 3 include region, week and year fixed effects. Additional controls in columns 2 and 4 include dummies for gender, education level (5 dummies), private sector, part-time work, age (4 dummies) and industry (10 dummies). Standard errors clustered at the year × education region level are reported in parentheses. ** and * denote significance at the 5% and 10% levels, respectively.

Table 2 - School holidays and weeks off: the case of cross-region commuters

	Employees with children 6-17		Employees w/o children	
	(1)	(2)	(3)	(4)
School holidays in region of residence	.162**	.163**	.041**	.043**
	(.013)	(.013)	(.014)	(.013)
School holidays in region of work	.006	.009	-.002	-.003
	(.016)	(.015)	(.016)	(.015)
School holidays in the other region	-.014	-.012	.011	.012
	(.017)	(.016)	(.017)	(.017)
Add. controls	no	yes	no	yes
Obs.	6,537	6,537	6,476	6,476
Mean dep. var.	.104	.104	.121	.121

Source: Labor Force Surveys, 2003-2011, INSEE.

Note: The sample includes employees observed between weeks 2 and 25 and who do not work and live in the same education region. We exclude those who work in education (or whose spouse, if any, works in education) as well as those with two or less months of seniority. Columns (1) and (2) refer to the subsample living with children aged 6-17 whereas columns (3) and (4) refer to the subsample living without children. The table shows the results from reduced-form regressions in which a dummy indicating that a worker living in region *z* and working in region *z'* takes a week off during week *w*, in year *t* is regressed on a dummy indicating that *w* corresponds to school holidays in *z* and *t*, a dummy indicating that *w* corresponds to school holidays in z' and *t*, a dummy indicating that *w* corresponds to school holidays in the other education region in year *t* and a dummy indicating that *w* includes a day of public holidays in year *t*. Control variables in columns 1 and 3 include region, week and year fixed effects. Additional controls in columns 2 and 4 include dummies for gender, education level (5 dummies), private sector, part-time work, age (4 dummies) and industry (10 dummies). Standard errors clustered at the year × education region level are reported in parentheses. ** and * denote significance at the 5% and 10% levels, respectively.

Table 3 – School holidays and employees' vacation trips

Panel A		Employees with children		
	All	Income group		
		Low	Middle	High
	(1)	(2)	(3)	(4)
School break	.072**	.033**	.050**	.130**
	(.015)	(.008)	(.010)	(.020)
School break	.016	-.005	.015	.022
other region	(.015)	(.011)	(.014)	(.030)
Obs.	40,296	11,040	16,848	10,896
Mean dep. Var.	.018	.011	.012	.032
Panel B		Employees without children		
	All	Income group		
		Low	Middle	High
	(1)	(2)	(3)	(4)
School break	.018**	.009	.011	.030**
	(.005)	(.006)	(.007)	(.011)
School break	.007	.006	.014	.004
other region	(.009)	(.008)	(.013)	(.018)
Obs.	35,304	10,080	9,000	14,832
Mean dep. Var.	.028	.020	.021	.038

Source: Vacation Trip Survey, 2004, INSEE.

Note: The sample includes employees observed between weeks 2 and 25, excluding those who work in education (or whose spouse, if any, works in education). Panel A refers to the subsample living with children aged 6-17 whereas panel B refers to the subsample living without children. Column 1 shows the results from a reduced-form regression in which a dummy indicating that a worker goes away on a vacation trip during week *w* in region *z* is regressed on a dummy indicating that *w* falls within school holidays in *z* and a dummy indicating that *w* falls within school holidays in another region. Control variables include week and individual fixed effects. Columns 2 to 4 replicate this analysis on the subsamples defined by income terciles. Standard errors clustered at region level are reported in parentheses. ** and * denote significance at the 5% and 10% levels, respectively.

Table 4 – School holidays and retired workers' vacation trips

Panel A		Retired workers		
	All	Income group		
		Low	Middle	High
	(1)	(2)	(3)	(4)
School break	.019**	.004	.008	.047**
	(.008)	(.006)	(.009)	(.017)
School break	.007	-.002	.010	.015
other region	(.006)	(.006)	(.011)	(.016)
Obs.	57,288	18,144	14,712	18,360
Mean dep. Var.	.042	.017	.047	.066
Panel B		Retired workers whose spouse is retired		
	All	Income group		
		Low	Middle	High
	(1)	(2)	(3)	(4)
School break	.019**	.006	.008	.047**
	(.009)	(.006)	(.010)	(.019)
School break	.005	-.001	.012	.010
other region	(.007)	(.006)	(.012)	(.019)
Obs.	48,936	16,368	12,720	14,712
Mean dep. Var.	.042	.017	.046	.070

Source: Vacation Trip Survey, 2004, INSEE.

Note: The Table shows the results of replicating the same regression analysis as in Table 3 on the sample of retired workers (panel A) as well as on the sample of retired workers whose spouse is retired (panel B). Standard errors clustered at the region level are reported in parentheses. ** and * denote significance at the 5% and 10% levels, respectively.

Table 5 - School holidays and childcare

	All (N=1,873)		Age less than 50 (N=1,085)		Age 50 or more (N=788)	
	(1)	(2)	(3)	(4)	(5)	(6)
▪ No paid work	.158	+.075 (.024)**	.135	+.074 (.033)**	.189	+.074 (.047)
▫ *some childcare*	*.012*	*+.019 (.009)***	*.007*	*+.006 (.008)*	*.019*	*+.045 (.019)***
▫ *no childcare*	*.146*	*+.056 (.022)***	*.128*	*+.068 (.031)***	*.170*	*+.030 (.043)*
No childcare but meal with other households	*.049*	*+.022 (.019)*	*.056*	*+.048 (.027)**	*.038*	*-.024 (.022)*
▪ Some paid work	.842	-.075 (.024)**	.865	-.074 (.033)**	.811	-.074 (.047)
▫ *some childcare*	*.029*	*-.002 (.012)*	*.018*	*+.020 (.014)*	.044	-.039 (.019)**
▫ *no childcare*	*.813*	*-.073 (.028)***	*.847*	*-.094 (.037)***	.767	-.035 (.052)

Source: Time Use Surveys, 1999 and 2010, INSEE.

Note: The sample includes employees living without children observed between weeks 2 and 25, excluding those who work in education (or whose spouse, if any, works in education). Columns (1) and (2) refer to the full sample whereas columns (3) and (4) refer to the subsample aged less than 50 and columns (5) and (6) to the subsample aged 50 or more. We defined several types of time use diaries depending on whether they include (a) no paid work, (b) no paid work, but some childcare, (c) no paid work and no childcare, (d) no paid work, no childcare, but meals with people from other households (e) some paid work, (f) some paid work and some childcare, (g) some paid work, but no childcare. For each subsample, the first column shows the proportion of each type of day and the second column shows the effect of school holidays on the probability of occurrence of each type of day using the same regression model as in Table 1. Control variables include region, week and year fixed effects, dummies for gender, education level (5 dummies), private sector, part-time work, age (7 dummies) and a dummy for part-time work unknown. Standard errors clustered at the year × region level are reported in parentheses. ** and * denote significance at the 5% and 10% levels, respectively.

Table 6 - Cross effects on leisure demand at the region level: IV estimates

	First stage		IV
	Prop. of workers with children 6-17 off ($\underline{Y}_{pwzt}$)	Prop. of workers with children 6-17 off in other region ($\underline{Y}_{pw\text{-}zt}$)	Prop. of workers w/o children off ($\underline{Y}_{nwzt}$)
School holidays in the region	.190**	.008**	-
	(.004)	(.003)	
Number other regions on school holidays	.006*	.099**	-
	(.003)	(.003)	
Prop. of workers with children 6-17 off in the region ($\underline{Y}_{pwzt}$)	-	-	.30**
			(.02)
Prop. of workers with children off in other region ($\underline{Y}_{pw\text{-}zt}$))	-	-	.13**
			(.04)
Mean dep. var.	.096	.097	.106
Obs.	648	648	648

Source: Labor Force Surveys, 2003-2011, INSEE.

Note: Column 3 shows the results of regressing the proportion of workers without children taking a week off in region z, week w and year t ($\underline{Y}_{nwzt}$) on the proportion of workers with children taking a week off in z, w, t ($\underline{Y}_{pwzt}$) and the proportion of workers with children taking a week off in other regions ($\underline{Y}_{pw\text{-}zt}$), using a dummy indicating school holidays in *z*, *w*, *t* and a variable indicating the number of other regions on school holidays on *w* and *t*. Columns 1 and 2 shows the results of the corresponding first stage regressions. Control variables include full set of dummies for week, year fixed and region fixed effects. Standard errors are reported in parentheses. ** and * denote significance at the 5% and 10% levels, respectively.