

Work time and well-being for workers at home: evidence from the American Time Use Survey*

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Abstract

In this paper, we analyze the time allocation decisions of individuals who work from home (i.e., teleworkers), and compare them with their commuter counterparts. Using data from the American Time Use Survey for the years 2003 to 2015, we analyze the time spent working, and the timing of work, of both commuters and teleworkers. Results show that teleworkers devote 40% less time to market work activities than do commuters, and less than 60% of teleworkers work at ‘regular hours’, vs around 80% of their commuter counterparts. Using information from the *Well-being Module* for the years 2012 and 2013, we find that male teleworkers experience lower levels of negative feelings while working than do commuters.

Keywords: Telework; market work; well-being, American Time Use Survey

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1. Introduction

In this paper, we analyze the amount of time spent in market work during working days, the timing of market work, and the instant enjoyment experienced during market work activities, of male and female US teleworkers (i.e., workers who do not commute to/from work), in comparison with their commuter counterparts. Although telework was banned in some US industries from the 1940s to the 1990s, the practice of teleworking has increased in recent decades, with 20 million individuals in the US reporting working from home at least once a week, and this number is growing rapidly (Oettinger, 2011). Underlying the increase in the practice of telework, its benefits in terms of flexibility, control over the timing of work, work-life balance, and workers well-being (Gajendran and Harrison, 2007; Allen et al., 2013; Anderson et al., 2015; Dockery and Bawa, 2017) are well documented, even though analyses of such benefits are scarce and conclusions are mixed.

For many individuals, commuting represents a significant part of any working day (Susilo and Maat, 2007; Gimenez-Nadal and Molina, 2014; Gimenez-Nadal et al., 2018b), despite that it is one of the most unsatisfactory activities performed by workers (Kahneman et al., 2004; Kahneman and Krueger, 2006), and leads to a series of negative outcomes, including increased stress, psychological costs, and health problems (Wener et al., 2003; Gottholmseder et al., 2009; Roberts et al., 2011; van Ommeren and Gutiérrez-Puigarnau, 2011; Gimenez-Nadal and Molina, 2019). Furthermore, teleworking may be especially beneficial for female workers, as most household responsibilities continue to be carried out by women in developed countries (Aguiar and Hurst, 2007; Gimenez-Nadal and Sevilla, 2012, Gimenez-Nadal and Molina, 2016), and teleworking may allow women to better balance their work and household responsibilities.

Within this framework, we analyze the time spent in market work by both commuters and teleworkers. We find that teleworkers devote less time to market work activities during their working days, and that a lower proportion of teleworkers work during the central hours of the day (and a higher proportion devote time to non-paid work and leisure). We also analyze differences in well-being between teleworkers and commuters, and find differences in well-being between male commuters and teleworkers. The fact that we do not find differences in the instantaneous well-being of female workers may indicate that teleworking women still have difficulties balancing their work and

household responsibilities (Gimenez-Nadal and Sevilla, 2011), consistent with the Household Responsibilities Hypothesis (Gimenez-Nadal and Molina, 2016).

The contributions of the paper are twofold. First, we analyze the amount of time spent and the timing of market work of commuters and teleworkers. Our results contrast with prior research showing that working from home is related to more working time (Bloom et al., 2015), that family obligations are not instrumental in employee motivations to choose teleworking (Bailey and Kurland, 2002), and that working from home is related to a higher level of work-family conflict (Lapierre et al., 2016). Thus, we contribute to the literature that analyzes the benefits of teleworking, adding empirical evidence on the differences in work schedules. Second, we study the relationship between instantaneous well-being during work episodes and teleworking, contributing to the analysis of telecommuters' wellbeing (Golden, 2006). We find that male teleworkers are happier while working than are male commuters, but we do not find significant differences among females. This latter analysis contributes to the literature on the benefits of telework in terms of the well-being of workers, where the evidence is inconclusive.

The rest of the paper is organized as follows. Section 2 presents a literature review, and Section 3 describes the data. Section 4 analyzes the time devoted to market work and the timing of market work, for both teleworkers and commuters. Section 5 shows the results of the analysis of well-being, Section 6 discusses the results, and Section 7 summarizes the main conclusions of the paper.

2. Literature review

The literature has linked teleworking to several benefits, including environmental advantages for society as a whole, including reductions in agglomeration and traffic congestion, air pollution, population centrality, and energy consumption (Sampath et al., 1996; Safirova, 2002; White et al., 2007; Rhee, 2008). Telework is also considered a useful management approach for firms to improve organization and profitability and reduce attrition rates and office costs (Golden, 2006, Sardeshmukh et al., 2012; Duxbury and Halinski, 2014). However, these effects appear to vary across sectors, with little empirical evidence providing convincing results (Bloom et al., 2015).

One of the most studied benefits of teleworking is the improvement of the work-life balance of workers. For example, Gajendran and Harrison (2007), Allen et al. (2013) and

Chung and van der Horst (2018) find a negative relationship between work-family conflicts and teleworking. Dockery and Bawa (2017) also find that telework contributes to an equitable division of household responsibilities in Australia. In the same line, Edwards and Field-Hendrey (2002) find that telework is especially important for women in the US. Conversely, other applied research has not found differences between commuters and teleworkers in performance or work-life balance, and has concluded that teleworking is linked to diminished job prospects, work inclusion and co-worker satisfaction, low work outcomes for subordinates with teleworking managers, and loss of control over work processes (Bailey and Kurland, 2002; Golden, 2007; Rhee, 2008; Morganson et al., 2010; Golden and Fromen, 2011; Gajendran et al., 2014). Above all, existing analyses of the implications of telework are scarce and results appear to vary significantly among different scenarios and methodologies (Allen et al., 2015). One recent relevant study is that by Bloom et al. (2015), who use experimental data from China's CTrip to capture the effects on the firm and its workers of working from home. They find that working from home leads to 13% more calls, 3.5% from more calls taken per minute and 9.5% from more minutes on the phone.

Very few studies have directly analyzed whether teleworking allows for differences in the time-allocation decisions of workers, and results are mixed. Venkatesh and Vitaliri (1992) find that telework is not linked to differences in leisure time, in line with similar conclusions reached by Michelson (2000). Other researchers have studied the effects of teleworking on total working hours. Callister and Dixon (2001), using time-use surveys, find that New Zealand home workers spend more time working than their commuter counterparts. Peters and van der Lippe (2007), using Dutch data, find that teleworking practices are linked to longer work schedules. Golden (2008), using CPS data for the US, argues that working longer hours is associated with teleworking. Nätti et al. (2011) conclude that working at home is linked to less free time and more working hours. Rhee (2008) develops a general equilibrium model to find that most of the commuting time saved by teleworking is applied to more work, rather than more leisure. On the other hand, Wight and Raley (2009) studied teleworking, using the CPS and ATUS data, to find that home-based workers spend one hour less doing paid work activities than do office-based workers.

Regarding the well-being of teleworkers, Kossek et al. (2006) and Anderson et al. (2015) suggest that telework may be helpful in improving workers well-being, and Bloom

et al. (2015) find that self-reported welfare measures are significantly higher for home workers, revealing that employees may prefer working from home. Bentley et al. (2016), in the same line, find that telework is linked to increased job satisfaction and reduced psychological strain in New Zealand. However, as pointed out by Novaco and Gonzalez (2009), research comparing the personal well-being outcomes of teleworkers and commuters is inconclusive, as different authors find different results. For instance, Belanger (1999) reported that telecommuters do not show significant differences in either satisfaction or performance compared to commuters, Peters and van der Lipe (2007) find that teleworkers experience less enjoyable non-working time than commuters, and Kossek et al. (2006) find that telecommuting is related to higher levels of depression (except for female teleworkers with children) and work-to-family conflicts. Additionally, Konradt et al. (2003) find that, while telework is linked to lower stress at work, it is related to more stressful non-work activities.

3. Data and variables

We use the American Time Use Survey (ATUS) from years 2003 to 2015 to develop the empirical analyses. The ATUS provides us with information on individual time use, based on diaries in which respondents report their activities throughout the 24 hours of the day (from 4 am to 4 am of the next day). We pool all the years, so that we have enough observations for robust analyses.

We restrict the sample used throughout the empirical analysis to employee workers between the ages of 16 and 65 (inclusive). We omit self-employed workers, since they may operate home-based business, and thus should not be classed as teleworkers (Walls, 2004; O'Keefe et al., 2016). Additionally, the self-employed may consider certain activities, such as time spent with colleagues or clients, as part of their work, while employees may not consider it as market work, and so potential biases may emerge (Gimenez-Nadal et al., 2012). Furthermore, given that workers may have been asked to maintain the diaries during non-working days, we restrict the analysis to days when workers devote at least 60 minutes to market work activities, excluding commuting. We eliminate the observations that can be considered outliers in multivariate data, using the blocked adaptive computationally efficient outlier nominators algorithm proposed by Billor et al. (2000). That way, we identify atypical data, and eliminate biases arising from

strange or unusual workdays.¹ These restrictions leave us with a final sample of 22,083 males and 21,291 females.

The ATUS does not directly characterize teleworkers, but we identify them from the diary-level information as those workers who, having devoted at least 60 minutes to market work activities, excluding commuting, do not report any period of time of “commuting to/from work” (definition consistent with Pinsonneault and Boisvert, 2001; Golden, 2006; Kossek et al., 2006; Pearce, 2009; Morganson et al., 2010). This gives us 5,401 teleworkers, of whom 2,815 are males and 2,586 are females. We observe a higher (but not significant at standard levels) percentage of teleworkers among males (13.19%) than among females (12.67%).²

In order to explore whether our definition of telework, based on commuting time, captures aspects of telework, we analyze differences in industry/occupation between commuters and non-commuters. Table 1 shows the industries and occupations of both commuters and non-commuters. Some occupations have a higher share of teleworkers than they do of commuters; for example, management, business, finance, professional and sales represent 17.04% of commuters, but 22.4% of teleworkers. Conversely, production represents 9.05% of commuters, but only 7.03% of teleworkers. By industry, professional and business services, education and health have a larger percentage of non-commuters than commuters, while in industries such as construction, wholesale and retail trade, and leisure and hospitality, the percentage of non-commuters is smaller than that of commuters. According to these differences, non-commuters are more likely to work in industries and occupations that allow for telework, as they have a necessary technological component. Thus, although we are not measuring telework precisely, our definition based on commuting may well be capturing aspects of telework.

The ATUS allows us to define the time devoted to market work as the sum of the times devoted to main market work activities, excluding commuting. We aggregate the

¹ Results shown are robust to the inclusion of outliers and variations in the age limit of the sample (i.e., all workers) and are available upon request.

² This definition of telework is non-standard, and may impose limitations on our study. For example, it could be that the diary day is Saturday or Sunday, and the absence of commuting reflects that workers are catching up on work from the usual “working week”. Furthermore, if it is Friday, it could be capturing the absence of commuting for people who work at home after a Monday to Thursday commuting week. For this reason, we have alternatively analyzed differences in market work time for workers who were interviewed on Monday to Thursday, and results are robust, as we find that those who do not commute devote less time to market work in comparison to commuters. Moreover, in our econometric analysis, we control for the day of the week, to partially net out these differences.

market work time using the activity code “50101 work, main job (at home, not at home)”.³ The ATUS also allows us to identify the timing of different activities throughout the day, that is, the parts of the day when workers are doing market work, doing non-market work, or being at leisure. We then have the starting time and end time of all activities, which allows us to divide the day into 24 one-hour periods, and compute the proportion of time spent in each activity in each time band of the day (following Hamermesh, 1999).

Table 2 shows summary statistics of our variables of interest, sorted by whether the respondent is a teleworker or a commuter. (Pairwise correlations between variables are shown in Table A1 of the Appendix.) We develop the analysis by gender, given prior evidence showing the different time-allocation decisions of men and women (Gershuny, 2000; Aguiar and Hurst, 2007). We compare teleworkers against commuters, applying a t-type test of the equality of means to check if differences in average values are statistically significant. For commuters, the average time spent in market work activities on a working day is 508 and 464 minutes for males and females, while the time for teleworkers is 375 and 323 minutes for males and females, respectively. The differences between teleworkers and commuters are statistically significant at standard levels for both male and female workers. Table 2 shows the fraction of workers at work at three particular times, i.e., 3 am, Noon, and 9 pm. We can observe that at 3 am there are around 6% of males at work, with non-significant differences between commuters and teleworkers, while there are 3.2% of female commuters at work at that same time, vs 2.4% of teleworkers, with the difference being significant. At Noon, there is a significantly higher percentage of male and female commuters at work (77.1% and 78.8%, respectively) than the corresponding percentages of teleworkers (58.9% and 58.3%). At 9 pm, the trend reverses and there is a slightly higher percentage of male and female teleworkers at work (16.6% and 15.7%, vs 13.6% and 10.6%, respectively).⁴

To sum up, teleworkers devote less time to market work activities during their working days. These differences are concentrated in the central hours of the day, when

³ We use an alternative definition for market work, which includes the following activities: “50102 work, other jobs (at home, not at home)”, “50199 working nec (at home, not at home)”, “59999 work & related activities nec (at home, not at home)”, and “50205 waiting work related activities (at home, not at home).” Results for this alternative definition are robust for our main results, and are available upon request.

⁴ We also analyze the timing and the total time devoted to non-market work and leisure activities, finding that teleworkers devote more time to these activities (Table A2 in the Appendix), and a higher fraction of teleworkers devote time to these activities in the central hours of the day (Figure A1 in the Appendix), in comparison to commuters.

workers prefer to carry out their job tasks, as there are fewer teleworkers working, in comparison to commuters.

4. Telework and the allocation of time

We analyze the amount of time that male and female teleworkers spend in market work activities, in comparison to workers who commute to/from work. We also consider differences in the timing of these activities. We first estimate OLS models on the total time devoted to market work.⁵ For a given individual i , we estimate the following equation:

$$MW_i = \beta_0 + \beta_1 T_i + \beta_2 X_i + \alpha + \varepsilon_i. \quad (1)$$

where MW_i represents the daily minutes devoted to market work, T_i is the dummy that identifies teleworkers, and X_i is the vector of individual controls. The parameter α represents fixed effects at state level, and ε_i represents the error term. Individual controls (see Gimenez-Nadal et al. (2018a) and their references) include age, education (primary, secondary, or University education), being white (vs non-white), being American (vs non-American), living in couple (vs being single), couple's labor status (1 if partner works, 0 otherwise), the number of children, family size, being a full-time worker (vs part-time worker), the scheduled weekly work hours, hourly earnings, and the metropolitan (vs non-metropolitan) status of the place of residence of individuals.

When we explore differences in socio-demographic and job characteristics between teleworkers and commuters, we observe an average age of 41.7 (42.3) years for male (female) commuters, vs 43.9 (44.0) years for male (female) teleworkers. A larger fraction of teleworkers than commuters have attended University, indicating that jobs that allow telework require a higher level of formal education than jobs where teleworking is not allowed. There are relatively more American-born teleworkers than American-born commuters, among both males and females. With regard to family variables, a higher proportion of teleworkers live in couple and have a working partner than commuters. On the other hand, the average number of children is statistically similar at standard levels for male and female commuters and teleworkers. Finally, the number of weekly scheduled

⁵ We may observe “zero” time devoted to non-market work during the diary day, for instance, and thus there can be some controversy regarding the selection of alternative models, such as that of Tobin (1958). Gimenez-Nadal and Molina (2014, 2016) show that the use of Tobit or OLS models leads to similar conclusions, and thus we rely on OLS models. Results for Tobit models are available upon request.

work hours is significantly higher for teleworkers (44.4 hours per week for males, and 38.6 for females) than for commuters (43.5 and 37.8 hours, respectively).

In terms of hourly wages, commuters earn significantly more than teleworkers, perhaps to compensate for the monetary and temporary costs of commuting (see the concept of efficiency wages, in Shapiro and Stiglitz, 1984, and Gimenez-Nadal et al., 2018a). Furthermore, given that commuters have higher hourly wages than teleworkers, the higher opportunity cost of time (Becker, 1965) could explain the higher daily labor supply of commuters in comparison to teleworkers. Thus, we need to control for differences in hourly wages if we want to fully compare commuters and teleworkers.

In Table 3, we estimate Equation (1) by gender. Columns (1) and (2) show estimates for males and females of the baseline models, in which we control for basic socio-demographic characteristics, as previously described. In Columns (3) and (4), we include State, occupation, and industry fixed effects, to control for specific job and state heterogeneity, and then compare teleworkers with similar commuters in terms of work characteristics. In Columns (5) and (6) we include family size, scheduled work hours, log-of-real hourly earnings, and the metropolitan/non-metropolitan status of the place of residence, to control for household responsibilities, a more complete set of work characteristics (in addition to occupation and industry fixed effects), and differences arising from rural/urban areas, such as the availability of child-care services (Gimenez-Nadal et al., 2012). We find that male teleworkers devote 95.7 fewer minutes per day to market work activities, in comparison to commuters, while the difference in the case of females is 109.7 minutes per day.

The timing of work activities

We now compare how commuters and teleworkers allocate their work activities throughout their working day. Do teleworkers prefer to work at regular hours (morning and afternoon), which according to Hamermesh (1999) is considered preferable, or do they prefer to work in the evening or at night and have more free time to fulfill their household responsibilities during the central hours of the day, when children are awake and go to school? In order to account for the observed heterogeneity of workers in the timing of activities, we follow Hamermesh (1999) and define, for each individual i and

time period $t=0, 1, 2, \dots, 23$, a dummy variable W_{it} identifying whether individual i is working (1) in period t or not (0). For each t , we estimate the following OLS model:

$$W_{it} = \beta_{0t} + \beta_{1t}T_i + \beta_{2t}X_i + \alpha + \varepsilon_{it}, \quad (2)$$

where T_i represents the dummy that identifies teleworkers, X_i is the vector of individual controls, α are fixed effects at state level, and ε_i represents the error term.

Figure 1 shows estimates and 95% Confidence Intervals of the parameter β_{1t} associated with the variable “being a teleworker”, thus measuring the estimated difference between commuters and teleworkers.⁶ We observe that differences in favor of teleworkers (i.e., a higher percentage of commuters than teleworkers at work) are significant from 6am to 6pm at standard levels. Between 8 am and 3 pm, the greater differences are achieved when the percentage of commuters at work is more than 20% higher than the percentage of teleworkers at work. In the evening, until Midnight, differences are of 3 percentage points, and significant at standard levels, in favor of teleworkers (a higher percentage of teleworkers than commuters at work). That is to say, the percentage of commuter workers who are at work at regular hours is around 20% higher than the corresponding percentage of teleworkers, while in the evening and later, the percentage of teleworkers at work is around 3% higher than the percentage of commuters at work. From Midnight to 5 am, differences are negligible. In summary, we find that teleworkers work comparatively less during the central hours of the day, especially between 9 am and 3 pm.

5. Telework and well-being while working

We analyze the well-being of workers in their job tasks, comparing teleworkers and commuters. The ATUS conducted a *Well-being Module* in the years 2012, and 2013, aimed at measuring the instantaneous well-being experienced by individuals throughout the diary day (Kahneman et al., 2004; Kahneman and Krueger, 2006). Respondents fill out their diaries, and on the post-diary day individuals provide information about their feelings while doing three randomly chosen activities from among all the episodes of the diary day. These feelings are pain, happiness, sadness, fatigue, and stress, and take values

⁶ Estimated parameters are shown in Table A3 in the Appendix.

on a 7-point scale, from 0 (“did not experience the feeling at all”) to 6 (“feeling was extremely strong”).

We restrict the sample to employee workers who spend at least 60 minutes working throughout the day, excluding commuting, and eliminate self-employed workers. We consider whether workers are teleworkers or commuters, depending on whether they did any commuting during their working day, or not. Furthermore, we restrict the sample to market work activities (excluding commuting) in which information about the five subjective happiness scales is available, in order to analyze instantaneous well-being during market work activities. These restrictions leave us with 2,903 episodes of market work, corresponding to 2,471 individuals.

Table 2 (Panel B) shows summary statistics of the feelings of workers during market work activities. It can be observed that, for male workers, commuters report higher levels of sadness, stress, and tiredness, in comparison to male teleworkers. In particular, while male commuters have average values of 0.647, 2.316, and 2.341 for sadness, stress, and tiredness, respectively, male teleworkers have average values of 0.534, 1.922, and 1.754, with these differences being statistically significant at the 95 per cent confidence level. For female workers, the only statistically significant difference between teleworkers and commuters is for happiness, where teleworkers and commuters present average happiness values of 4.065 and 3.846, respectively.

We estimate OLS models, by gender, for a given individual i and work episode j as follows:

$$Y_{ij} = \beta_0 + \beta_1 T_i + \beta_2 X_i + \beta_S S_{ij} + \alpha + \varepsilon_{ij}, \quad (3)$$

where Y_{ij} represents each of the five reported feelings, T_i and X_{ij} are analogous to Equations (1) and (2), plus a life satisfaction ladder, S_j is a vector of episode-level controls, and ε_{ij} represents the error term.⁷ S_{ij} includes the presence of others while doing the activity, the duration of the activity, and the period of day in which the work activity is performed (Kahneman and Krueger, 2006), dividing the day in six periods, morning (from 8am to Noon), afternoon (from Noon to 4pm), evening (from 4pm to 8pm),

⁷ The life satisfaction ladder included in the Well-being module measures “how respondents personally feel about where they stand at present in regards to the best/worst possible life for them”, taking values 0 (“worst possible life”) to 10 (“best possible life”).

evening-night (from 8pm to Midnight), night (from Midnight to 4am). The period between 4am and 8am is taken as the reference period.

Estimates indicate that male teleworkers report lower levels of stress, pain, and tiredness, with this difference being statistically significant at the 95% confidence level. We find no statistically significant differences between female teleworkers and commuters in the feelings reported during market work activities. In sum, we find that male teleworkers are better off than commuters in terms of the instantaneous well-being they obtain while working, but this is not the case for female workers, where we find no differences. As estimates include occupation and industry fixed effects, gender differences are not likely to be explained by differences in the type of job that men and women perform.

6. Discussion of Results

One of the hypothesized benefits of telework is that of a better work-life balance (Gajendran and Harrison, 2007; Allen et al., 2013; Chung and van der Horst, 2018). One aspect in which telework may be linked to a better work-life balance is that telework may allow workers to have more flexibility in their working hours, which may be similar to the channel used for self-employed mothers (Gimenez-Nadal et al., 2012). In this sense, teleworkers spend more time in non-market work and leisure activities during standard work hours (see Figure A1 in the Appendix) and leave market work responsibilities to non-standard work hours (6 pm onwards). If parents must be available for children, they should, ideally, be available early in the morning and in the central hours of the day. Instead of working, teleworking parents can be doing non-market work (e.g., childcare) early in the morning and in the central hours of the day, leaving market work responsibilities for later in the day.

Further evidence that reinforces the idea that telework may improve the work-life balance of parents refers to the possibility that it allows parents to take care of their children while they are working. We exploit the information included in the ATUS via two variables. The first refers to the “who else is present” question, that can be used to determine whether children are present while their parents are working. The second question refers to the “in care of child <13”, which allows us to identify whether the parent reported caring for any child under age 13 at the time of the activity. We compute

the total market work time reported as being with a child, or caring for a child under age 13.

When we compare the time devoted to market work by parents with a child present, we find that male and female teleworkers spend 14.27 and 12.01 minutes, respectively, of market work time per day in the presence of at least one child, while male and female commuters devote only 2.41 and 3.06 minutes of their working day in the presence of children. When we compare the time devoted to market work when parents report caring for at least one child under 13, male and female teleworkers spend 49.12 and 62.44 minutes of market work time caring for children, while male and female commuters spend only 3.56 and 8.35 minutes. The differences between teleworkers and commuters are statistically significant at the 99% confidence level. All in all, the evidence presented here is consistent with the idea that teleworking allows for a better work-life balance of parents, conforming to one of the hypothesized benefits of teleworking.

Regarding the well-being of teleworkers, in comparison to commuters, we find that male teleworkers report lower levels of stress, tiredness, and pain, in comparison to male commuters. These differences are present after controlling for differences in the type of jobs between the two groups of workers, indicating that such differences are not due to differences in jobs. These results are consistent with prior literature showing that teleworkers report higher levels of well-being (Kossek et al., 2006; Anderson et al., 2015; Bloom et al., 2015) and lower levels of strain (Bentley et al., 2016), adding to the literature where results are mixed. However, we do find gender differentials, as we find no differences in the feelings reported by female teleworkers and commuters.

Several factors may explain these gender differentials in the relationship between teleworking and well-being while working. First, women have lower expectations of their work, in comparison to men, which leads them to report higher levels of job satisfaction (Clark, 1997). These lower expectations may imply that differences in job between male and female workers are not translated into well-being differences. Second, women generally have shorter commuting times than males (Sandow and Westin, 2010; Dargay and Clark, 2012; McQuaid and Chen, 2012, Gimenez-Nadal, Molina and Velilla, 2018b) and hence commuting may not have so many negative consequences for females' health. As a result, the differences in the well-being of female teleworkers and commuters is not high enough to be statistically significant. Third, despite that female telecommuters may have greater flexibility with market work hours and schedules, women may not be happier

at work because they do more non-market work in the hours they are not doing paid work, while men spend more time on leisure. In fact, Table A2 in the Appendix shows that male and female telecommuters have the same amount of extra leisure in comparison to their commuter counterparts, but female teleworkers experience a relative increase in non-market work time. Thus, while male teleworkers may experience a relative increase in leisure, in comparison to their male commuter counterparts, female teleworkers experience a relative increase in non-market work in comparison to their female commuter counterparts, which leads to the same levels of stress, tiredness, and pain during market work activities, especially given that female teleworkers are more likely to work late hours, when non-market work responsibilities have been fulfilled. We cannot disentangle the reasons for the gender difference in the effect of teleworking on well-being, and we leave this issue for future research.

7. Conclusions

In this paper, we first analyze how male and female teleworkers, defined as employees who do not spend time commuting to/from work, spend their time in market work, non-market work, and leisure activities, in contrast to those who commute to a workplace. Our results indicate that teleworkers work fewer hours than do commuters during their working days, and specifically during the central hours of the day. Scheduled work hours, full-time employment rates, job characteristics, and wages do not explain these differences for males or females. Our results contrast with Bloom et al. (2015), who find that those working from home work more hours in comparison to office-based workers.

The difference in our results for the analysis of hours of work may be due to the limitations of the data. Given that we only analyze one working day per individual, despite that day teleworkers devote less time to market work activities, it may well be that teleworkers are more likely to spread their work over more days in the week, and in the end still spend more hours in paid work than do commuters. The current data may not be capturing variations over a longer period, such as a week. Less work during the day(s) sampled may be offset by spreading work over more than five days, and/or respondents who practice a mix of ‘teleworking’ and ‘commuting’ days, perhaps with longer working hours in the latter category, but travelling to/from work less than five days a week (White et al., 2007). Access to time use surveys with information for the seven days of the week,

or with work grids in which individuals report their work schedules during a full week, would help to reconcile these contrasting findings.

Second, we analyze whether teleworkers are happier at work than their commuter counterparts, and we show this to be the case for male teleworkers, but not for females. Male teleworkers are happier than male commuters, but there are no differences between female teleworkers and female commuters in terms of well-being while working. This may indicate that, despite that female telecommuters may have greater flexibility with market work hours and schedules, they still have problems balancing work and household responsibilities (that is to say, female teleworkers are not happier, because they do more non-market work in the hours they are not doing paid work), which leads to the differential in market work time not being translated into improved well-being. Furthermore, women may still be more effective/productive in the hours they do work because they know they do not have more time to spend on paid work. Unfortunately, the ATUS does not include data on the productivity of workers, and we do not know whether the fewer hours of work of teleworkers are traded-off by greater productivity of those hours. Bloom et al. (2015) highlight the change in the performance per hour as a negative expected outcome of working from home, although they find an increase in the number of calls taken, consistent with happier workers. More research on this topic is needed.

Another limitation of the analysis lies in our definition of teleworking, as the ATUS does not directly characterize teleworkers and thus is not standard in the literature. Given that this data is based on diaries, we define teleworkers as those individuals who report having worked the diary day, but do not report having commuted to a workplace. However, this definition does not allow us to distinguish between high-intensity versus low-intensity teleworkers (Biron and Veldhoven, 2016), as we have no information on commuting behavior during the normal workweek.

Furthermore, the ATUS constitutes a cross-sectional database, so we cannot provide results in terms of causality, and results are based on conditional correlations and on unobserved heterogeneity (motivations) of employees. For instance, despite that we compare teleworkers with similar commuters in terms of socio-demographic factors, it may be that male teleworkers are happier while working due to unobserved factors, and it is these unobserved factors that make them more productive. Experiments, where workers are randomly assigned to work at home, would serve to isolate results from sample selection issues.

The results of this paper have important practical consequences for planners and policy makers. Prior research has found that a significant source of inequality that has often been ignored by applied research, comes from intra-household allocations (Chiappori and Meghir, 2015; Radchenko, 2016). Such conclusions are consistent with prior empirical analyses finding significant gender gaps in terms of household responsibilities. In such a way, besides all the hypothesized benefits for society (e.g., less pollution and traffic congestion), telework may be a useful way to reduce intra-household inequalities by allowing for a better work-family balance. Despite that results point to a better balance, we also find that teleworking women (mothers) spend relatively more time in non-paid work (with children) than do their male counterparts. This suggests that telework does not have clearly positive effects on intra-household inequality, at least in terms of time allocations. Results in terms of subjective well-being point in the same direction. Consequently, even though teleworking could be a useful tool to tackle work-family conflicts, it is not clear whether it ultimately reduces inequality within households.

DECLARATION OF INTEREST: NONE

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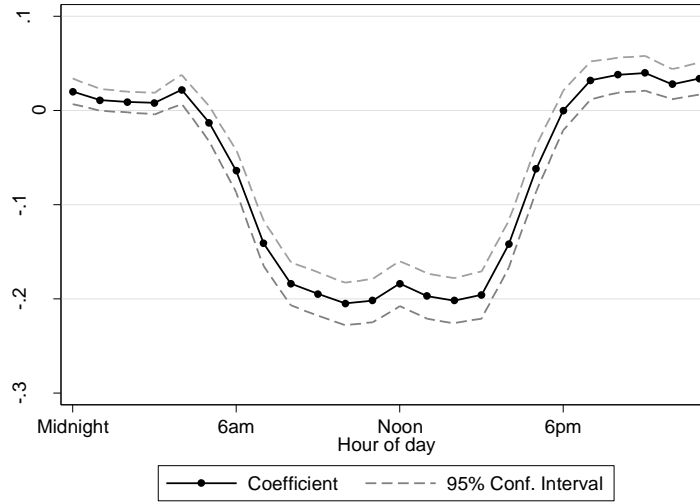
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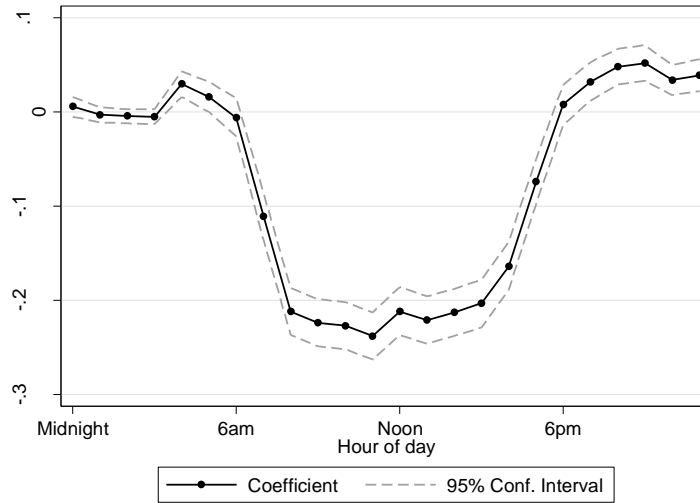
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Figure 1. Estimated differences in fraction at work between male and female teleworkers and commuters, by period of time
A. MALES



B. FEMALES



Note: The sample (ATUS 2003-2015) has been restricted to employees who devote at least 60 minutes to work activities during the diary day (excluding commuting). The self-employed are not included in the sample. Teleworkers are defined as those workers who do not commute to/from work. We estimate the following Ordinary Least Squares: $W_{ij} = \alpha + \beta X_i + \varepsilon_{ij}$, where W_{ij} represents a dummy variable indicating whether worker “ i ” is doing a market work activity (1) or not (0) in time band “ j ” ($j = \text{“Midnight”, ..., 11pm}$). The vector X_i includes socio-demographic characteristics of workers, which are the following: being a teleworker, age, age squared, secondary ed., University ed., being white, being American, live in couple, couple labor status, n. of children, family size, full-time worker, scheduled work hours, log-hourly earnings, metropolitan, and State, industry and occupation FE. Coefficients shown in Figure 1 are the estimated coefficient at the 95% Confidence Interval of the variable “being a teleworker”, as shown in Table A3 in the Appendix.

Table 1. Percentage of teleworkers and commuters, by occupation and industry

% by occupation	MALES		FEMALES	
	Commuters	Teleworkers	Commuters	Teleworkers
Management, business, finance	17.04	22.24	15.62	20.84
Professional	19.64	28.17	27.92	37.08
Service occ.	12.7	8.67	18.51	12.37
Sales	9.64	10.73	10.26	8.2
Office and administration	6.54	4.58	20.89	14.27
Farming, fishing, forestry	1.15	1.14	0.34	0.54
Construction and extraction	8.11	4.58	0.25	0.27
Installation, repair and maintenance	7.09	4.87	0.31	0.27
Production	9.05	7.03	3.95	4.22
Transportation	9.05	7.99	1.95	1.93
% by industry				
Agriculture, forestry, fishing, hunting	1.47	2.06	0.39	0.54
Mining	0.98	1.07	0.14	0.08
Construction	9.35	5.26	1.04	1.66
Manufacturing	17.45	17.58	7.56	8.24
Wholesale and retail trade	14.74	11.55	12.98	8.97
Transportation and utilities	7.73	8.77	2.68	2.71
Information	2.99	3.73	2.26	3.4
Financial activities	6.15	7.39	8.92	8.58
Professional and business services	10.66	15.24	8.55	12.88
Education and health	11.23	14.28	36.66	38.28
Leisure and hospitality	6.81	4.09	8.26	5.3
Other services	4.21	3.09	4.83	4.83
Public administration	6.22	5.9	5.73	4.52

Note: T-type test p-values in parentheses. The sample (ATUS 2003-2015) has been restricted to employees who devote at least 60 minutes to work activities during the diary day (excluding commuting). The self-employed are not included in the sample. Teleworkers are defined as those workers who do not commute to/from work.

Table 2. Summary statistics, by gender

Panel A: Individual Variables	MALES					FEMALES				
	Commuters		Teleworkers		p-value	Commuters		Teleworkers		p-value
	Mean	S.D.	Mean	S.D.		Mean	S.D.	Mean	S.D.	
Minutes at market work	508.319	144.886	375.043	235.334	(<0.001)	464.932	134.966	323.833	203.128	(<0.001)
Fraction at work at:										
3 am	0.052	0.223	0.056	0.229	(0.358)	0.032	0.176	0.024	0.153	(0.022)
Noon	0.771	0.420	0.589	0.492	(<0.001)	0.788	0.408	0.583	0.493	(<0.001)
9 pm	0.136	0.343	0.166	0.372	(<0.001)	0.106	0.308	0.157	0.364	(<0.001)
Age	41.683	11.250	43.826	10.722	(<0.001)	42.284	11.570	43.942	10.991	(<0.001)
Primary ed.	0.087	0.281	0.042	0.200	(<0.001)	0.063	0.243	0.036	0.186	(<0.001)
Secondary ed.	0.284	0.451	0.210	0.407	(<0.001)	0.263	0.440	0.171	0.377	(<0.001)
University ed.	0.629	0.483	0.749	0.434	(<0.001)	0.674	0.469	0.793	0.405	(<0.001)
Being white	0.838	0.369	0.844	0.363	(0.361)	0.789	0.408	0.800	0.400	(0.195)
Being American	0.815	0.389	0.847	0.360	(<0.001)	0.850	0.357	0.882	0.323	(<0.001)
Live in couple	0.654	0.476	0.672	0.470	(0.058)	0.538	0.499	0.572	0.495	(0.001)
Partner labor status	0.440	0.496	0.454	0.498	(0.162)	0.459	0.498	0.493	0.500	(0.001)
Number of children	0.994	1.163	0.972	1.112	(0.332)	0.940	1.091	0.925	1.091	(0.514)
Family size	2.991	1.526	2.904	1.484	(0.005)	2.812	1.427	2.778	1.417	(0.250)
Full-time worker	0.827	0.378	0.836	0.370	(0.240)	0.672	0.470	0.657	0.475	(0.131)
Scheduled work hours	43.506	14.482	44.467	16.632	(0.001)	37.871	13.277	38.651	15.912	(0.007)
Hourly earnings	8.443	11.048	6.940	11.734	(<0.001)	8.094	9.905	6.182	10.051	(<0.001)
Metropolitan status	0.832	0.374	0.842	0.365	(0.168)	0.830	0.375	0.855	0.352	(0.002)
N. Individuals	18,714		2,815			18,122		2,586		
Panel B: Episode-Level Variables										
Happiness	3.855	1.496	3.970	1.546	(0.810)	4.065	1.501	3.843	1.653	(0.076)
Sadness	0.647	1.231	0.534	1.284	(0.011)	0.643	1.330	0.586	1.206	(0.551)
Stress	2.316	1.849	1.922	1.559	(0.050)	2.615	1.940	2.981	1.781	(0.021)
Pain	0.901	1.454	0.599	1.127	(0.065)	0.835	1.508	0.958	1.632	(0.154)
Tiredness	2.341	1.754	1.961	1.647	(0.007)	2.490	1.857	2.727	1.878	(0.103)
Length of work episode	234.011	154.133	218.632	168.088	(0.175)	224.081	142.944	195.410	168.400	(0.027)
N. Individuals	1,189		176			978		128		
N. Episodes	1,400		220			1,139		144		

Note: T-type test p-values in parentheses. The sample in Panel A (ATUS 2003-2015) has been restricted to employees who devote at least 60 minutes to work activities during the diary day (excluding commuting). The sample in Panel B (ATUS *Well-being Module* 2012-2013 at diary level) has been restricted to employees who devote at least 60 minutes to work activities during the diary day (excluding commuting) and to episodes of paid work (excluding commuting). The self-employed are not included in the samples. Teleworkers are defined as those workers who do not commute to/from work. Work episodes are measured in minutes. Minutes at market work are measured in minutes per day. Age is measured in years. Scheduled work hours are measured in hours per week. Hourly earnings are measured in real \$ per hour of work. Life satisfaction ladder indicates how respondents personally feel about where they stand in the present with regard to the best/worst possible life for them, and takes values from 0 ("worst possible life") to 10 ("best possible life"). THIS DOES NOT BELONG HERE. B Happiness, Sadness, Stress, Pain and Tiredness measure how much happiness/sadness/stress/pain/tiredness respondents felt during the correspondent activity, and take values from 0 ("not at all") to 6 ("very").

Table 3. Estimates on the daily minutes of (market) work

VARIABLES	BASELINE MODEL		PLUS F.E.		PLUS CONTROLS	
	(1) Male	(2) Female	(3) Male	(4) Female	(5) Male	(6) Female
Being a teleworker	-94.70*** (5.200)	-111.1*** (5.189)	-96.48*** (5.176)	-112.6*** (5.134)	-95.74*** (5.053)	-109.7*** (4.798)
Age	7.645*** (0.763)	6.016*** (0.748)	6.998*** (0.754)	4.902*** (0.751)	3.728*** (0.724)	1.847*** (0.689)
Age squared	-9.218*** (0.906)	-6.882*** (0.889)	-8.473*** (0.897)	-5.630*** (0.889)	-4.531*** (0.862)	-1.892** (0.816)
Secondary ed.	7.213 (4.532)	15.41*** (4.932)	9.843** (4.594)	12.35** (4.947)	3.302 (4.491)	6.773 (4.790)
University ed.	1.753 (4.283)	26.55*** (4.660)	7.390 (4.656)	16.40*** (4.951)	-2.434 (4.552)	9.057* (4.821)
Being white	9.029*** (3.217)	-4.271 (3.007)	7.236** (3.295)	-3.917 (3.006)	3.320 (3.184)	-3.103 (2.852)
Being American	4.608 (3.054)	4.448 (3.304)	1.715 (3.215)	0.858 (3.524)	1.631 (3.157)	0.173 (3.324)
Live in couple	25.17*** (3.638)	1.003 (4.291)	21.13*** (3.575)	-0.138 (4.230)	12.53*** (3.495)	2.008 (4.117)
Couple labor status	-8.978*** (3.066)	-8.880** (4.196)	-7.209** (3.031)	-10.08** (4.116)	-5.026* (2.891)	-7.449* (3.853)
N. of children	-4.533*** (1.192)	-8.395*** (1.252)	-4.370*** (1.177)	-7.685*** (1.243)	-2.235 (2.029)	-3.652** (1.838)
Family size	-	-	-	-	-1.107 (1.662)	0.395 (1.457)
Full time worker	-	-	-	-	30.37*** (3.289)	40.22*** (2.686)
Scheduled work hours	-	-	-	-	2.096*** (0.115)	2.348*** (0.129)
Log-hourly earnings	-	-	-	-	-1.527* (0.913)	-0.112 (0.833)
Metropolitan status	-	-	-	-	-4.408 (3.365)	-4.694 (3.203)
Constant	346.1*** (15.14)	337.2*** (15.20)	369.7*** (22.69)	405.6*** (35.68)	328.3*** (22.57)	358.5*** (31.55)
State F.E.	No	No	Yes	Yes	Yes	Yes
Industry F.E.	No	No	Yes	Yes	Yes	Yes
Occupation F.E.	No	No	Yes	Yes	Yes	Yes
Observations	21,529	20,708	21,529	20,708	21,529	20,708
R-squared	0.051	0.070	0.069	0.093	0.122	0.176

Note: Robust standard errors in parentheses. The sample (ATUS 2003-2015) has been restricted to employees who devote at least 60 minutes to work activities during the diary day (excluding commuting). The self-employed are not included in the sample. Teleworkers are defined as those workers who do not commute to/from work. The dependent variable is the daily minutes devoted to paid work (excluding commuting). Work episodes are measured in minutes. Age is measured in years. Age squared is defined as $age^2/100$. Scheduled work hours are measured in hours per week. Hourly earnings are measured in real \$ per hour of work. Reference category for education variables: Primary education. Industry F.E. include the following categories: Mining; Construction; Manufacturing; Wholesale and retail trade; Transportation and utilities; Information; Financial activities; Professional and business services; Educational and health services; Leisure and hospitality; Other services; Public administration (ref: Agriculture, forestry, fishing, and hunting). Occupation F.E. include the following categories: Professional and related; Service; Sales and related; Office and administrative support; Farming, fishing, and forestry; Construction and extraction; Installation, maintenance, and repair; Production; Transportation and materials moving (ref: Management, business, and financial).

* Significant at the 90%. ** Significant at the 95%. *** Significant at the 99%.

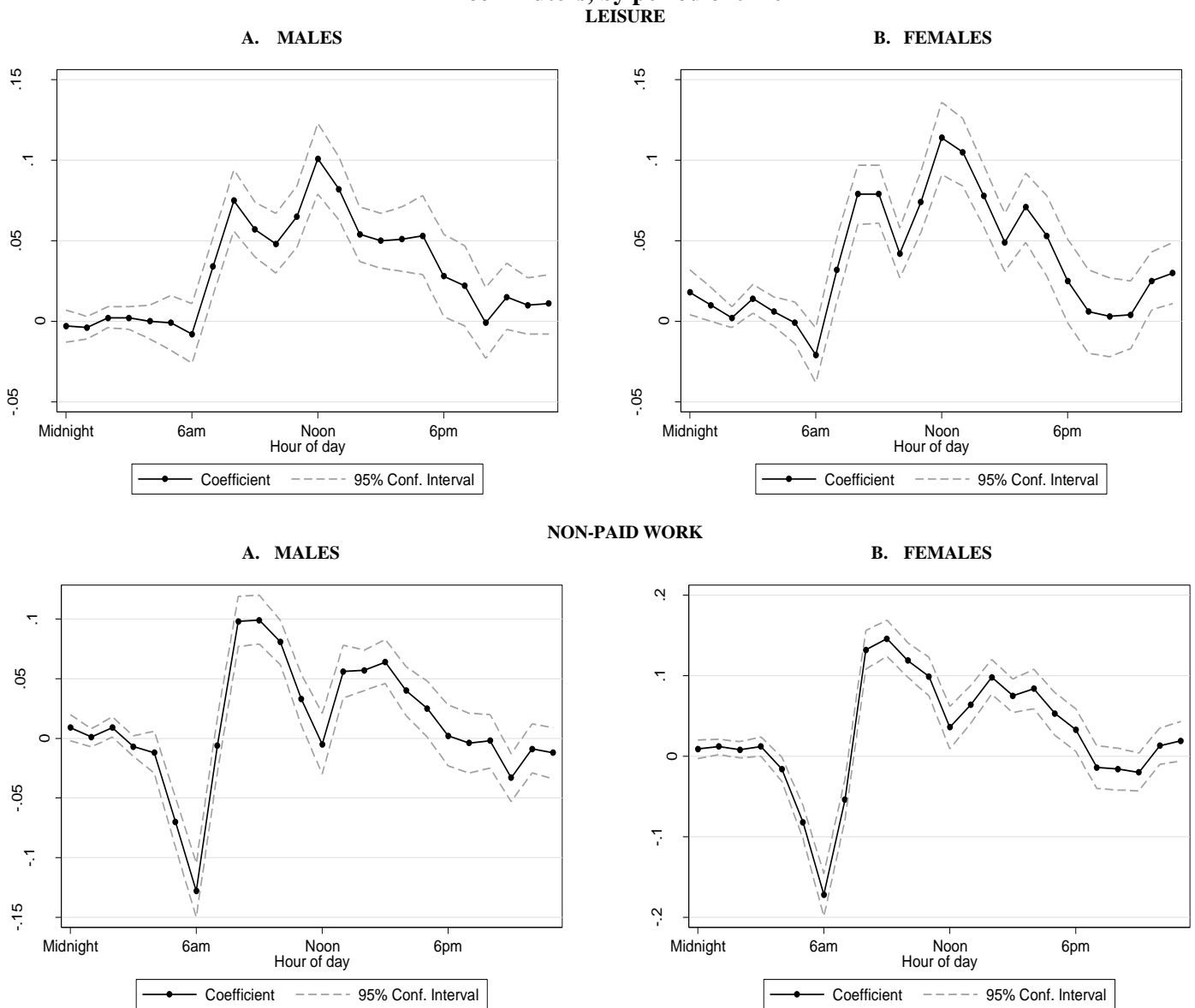
Table 4. Estimates on instant enjoyment variables

VARIABLES	MALES					FEMALES				
	(1) Happiness	(2) Stress	(3) Pain	(4) Sadness	(5) Tiredness	(6) Happiness	(7) Stress	(8) Pain	(9) Sadness	(10) Tiredness
Being a teleworker	0.205 (0.140)	-0.380** (0.151)	-0.282** (0.114)	-0.156 (0.181)	-0.360** (0.165)	-0.033 (0.187)	0.373 (0.238)	0.089 (0.200)	-0.036 (0.134)	0.373 (0.238)
Age	0.023 (0.033)	0.028 (0.039)	0.025 (0.027)	0.018 (0.026)	0.016 (0.033)	-0.081** (0.032)	-0.005 (0.045)	0.073* (0.039)	0.013 (0.029)	-0.005 (0.045)
Age squared	-0.021 (0.039)	-0.030 (0.045)	-0.015 (0.031)	-0.012 (0.031)	-0.025 (0.039)	0.119*** (0.037)	-0.004 (0.053)	-0.075 (0.047)	-0.013 (0.033)	-0.004 (0.053)
Secondary ed.	0.100 (0.216)	-0.449 (0.320)	-0.359 (0.220)	-0.300 (0.195)	-0.749*** (0.274)	0.416 (0.332)	-0.001 (0.397)	-0.203 (0.307)	-0.347 (0.305)	-0.001 (0.397)
University ed.	-0.201 (0.214)	-0.134 (0.325)	-0.264 (0.222)	-0.245 (0.211)	-0.668** (0.276)	0.178 (0.331)	0.304 (0.398)	-0.405 (0.303)	-0.358 (0.295)	0.304 (0.398)
Being white	-0.286** (0.130)	0.161 (0.158)	-0.049 (0.123)	-0.027 (0.121)	0.144 (0.167)	0.184 (0.136)	-0.154 (0.190)	-0.105 (0.153)	-0.321** (0.142)	-0.154 (0.190)
Being American	-0.323** (0.144)	0.104 (0.185)	0.144 (0.134)	-0.118 (0.118)	-0.221 (0.178)	-0.047 (0.151)	-0.276 (0.221)	-0.294* (0.174)	-0.471*** (0.180)	-0.276 (0.221)
Live in couple	-0.019 (0.158)	0.330 (0.211)	0.243 (0.149)	-0.031 (0.119)	-0.174 (0.177)	0.032 (0.175)	0.229 (0.254)	0.353 (0.226)	0.299 (0.194)	0.229 (0.254)
Couple labor status	-0.085 (0.133)	-0.129 (0.159)	-0.145 (0.119)	-0.043 (0.105)	0.170 (0.143)	-0.093 (0.177)	0.037 (0.233)	-0.432** (0.212)	-0.212 (0.183)	0.037 (0.233)
N. of children	-0.055 (0.084)	-0.120 (0.099)	-0.040 (0.082)	-0.131 (0.083)	-0.084 (0.100)	0.143* (0.082)	0.052 (0.118)	-0.018 (0.086)	0.060 (0.077)	0.052 (0.118)
Family size	0.013 (0.064)	0.056 (0.077)	0.023 (0.057)	0.114* (0.069)	0.121 (0.074)	0.018 (0.057)	-0.041 (0.096)	-0.091 (0.056)	-0.155*** (0.054)	-0.041 (0.096)
Full time worker	-0.163 (0.131)	0.226 (0.159)	-0.310** (0.146)	-0.040 (0.126)	-0.220 (0.182)	-0.026 (0.126)	0.455*** (0.167)	-0.220* (0.133)	-0.003 (0.111)	0.455*** (0.167)
Scheduled work hours	-0.000 (0.003)	0.001 (0.004)	-0.004 (0.003)	-0.000 (0.003)	0.005 (0.004)	-0.008** (0.004)	0.004 (0.005)	0.001 (0.004)	0.002 (0.003)	0.004 (0.005)
Log-hourly earnings	-0.049 (0.035)	-0.058 (0.042)	0.003 (0.034)	-0.060* (0.031)	-0.025 (0.045)	0.058 (0.039)	-0.006 (0.052)	0.009 (0.043)	0.078** (0.038)	-0.006 (0.052)
Metropolitan status	0.355** (0.139)	-0.056 (0.166)	-0.047 (0.134)	-0.106 (0.109)	-0.204 (0.165)	0.125 (0.150)	-0.030 (0.200)	0.141 (0.171)	0.099 (0.142)	-0.030 (0.200)
Period of day										
Morning	0.144 (0.126)	0.214 (0.161)	-0.090 (0.124)	0.085 (0.104)	0.048 (0.166)	-0.020 (0.134)	-0.100 (0.180)	0.178 (0.144)	0.127 (0.126)	-0.100 (0.180)
Afternoon	-0.031 (0.120)	0.404*** (0.154)	-0.096 (0.112)	0.087 (0.108)	0.265* (0.140)	-0.260* (0.143)	0.094 (0.180)	0.123 (0.146)	0.118 (0.126)	0.094 (0.180)
Evening	-0.284 (0.183)	0.440 (0.291)	-0.199 (0.211)	0.039 (0.154)	0.315 (0.255)	-0.756*** (0.235)	0.085 (0.375)	0.422 (0.290)	0.141 (0.264)	0.085 (0.375)
Evening-night	-0.085 (0.307)	0.595 (0.397)	-0.107 (0.272)	0.102 (0.216)	0.703** (0.274)	-1.481*** (0.500)	0.214 (0.524)	0.723* (0.431)	-0.350* (0.191)	0.214 (0.524)
Night	-0.236 (0.372)	0.253 (0.480)	-0.592** (0.255)	-0.165 (0.230)	0.692 (0.969)	-1.540 (1.150)	0.727 (0.670)	1.533** (0.747)	0.470 (0.816)	0.727 (0.670)
Presence of others										
Spouse/partner	-0.079 (0.334)	-0.466 (0.412)	-0.184 (0.252)	0.230 (0.263)	-0.017 (0.523)	-0.447 (0.406)	0.561 (0.407)	0.252 (0.463)	0.382 (0.372)	0.561 (0.407)
Children	0.053 (0.360)	0.142 (0.962)	-0.115 (0.639)	0.418 (0.255)	-0.043 (0.530)	-0.164 (0.249)	0.724 (0.746)	0.950 (0.627)	0.999*** (0.352)	0.724 (0.746)
Other relatives	-0.169 (0.405)	0.634 (0.596)	-0.049 (0.571)	0.836 (0.624)	0.666 (0.566)	-0.261 (0.885)	0.619 (0.765)	-0.747*** (0.266)	-0.158 (0.557)	0.619 (0.765)
Friends/mates	0.654* (0.350)	-0.514 (0.609)	-0.374 (0.408)	-0.264 (0.422)	-0.317 (0.550)	0.386 (0.473)	-0.239 (0.552)	0.441 (0.710)	0.059 (0.295)	-0.239 (0.552)
Coworkers	0.228* (0.118)	0.042 (0.143)	-0.137 (0.113)	0.006 (0.103)	0.013 (0.139)	0.166 (0.138)	0.053 (0.189)	0.239* (0.140)	0.169 (0.107)	0.053 (0.189)
Other	0.050 (0.478)	0.003 (0.510)	-0.322 (0.375)	-0.258 (0.319)	0.285 (0.431)	0.509* (0.299)	-0.109 (0.369)	0.393 (0.310)	-0.176 (0.178)	-0.109 (0.369)
Duration of episode	-0.001* (0.000)	0.002*** (0.000)	0.000 (0.000)	0.000 (0.000)	0.001 (0.000)	-0.001*** (0.000)	0.002*** (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.002*** (0.000)
Life satisfaction	0.239*** (0.029)	-0.251*** (0.034)	-0.183*** (0.028)	-0.163*** (0.027)	-0.214*** (0.031)	0.221*** (0.028)	-0.222*** (0.041)	-0.093*** (0.035)	-0.148*** (0.027)	-0.222*** (0.041)
Constant	2.478** (0.969)	3.753*** (1.135)	2.834*** (0.834)	2.202*** (0.708)	4.811*** (0.981)	2.406*** (0.874)	5.429*** (1.373)	1.128 (0.983)	3.340*** (0.886)	5.429*** (1.373)

State F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Occupation F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,620	1,620	1,620	1,620	1,620	1,283	1,283	1,283	1,283	1,283
R-squared	0.226	0.229	0.183	0.183	0.181	0.271	0.214	0.170	0.176	0.214

Note: Robust standard errors clustered at the individual level in parentheses. The sample (ATUS *Well-being Module* 2012-2013 at diary level) has been restricted to employees who devote at least 60 minutes to work activities during the diary day (excluding commuting) and to episodes of paid work (excluding commuting). Self-employed are not included in the sample. Teleworkers are defined as those workers who do not commute to/from work. Happiness, Sadness, Stress, Pain and Tiredness measure how much happiness/sadness/stress/pain/tiredness respondents felt during the correspondent activity, and take values from 0 (“not at all”) to 6 (“very”). Life satisfaction indicates how respondents personally feel about where they stand in the present with regard to the best/worst possible life for them, and takes values from 0 (“worst possible life”) to 10 (“best possible life”). Work episodes are measured in minutes. Age is measured in years. Age squared is defined as $age^2/100$. Scheduled work hours is measured in hours per week. Hourly earnings are measured in real \$ per hour of work. Reference category for education variables: Primary education. Periods of day are defined as follows: Morning (8am to Noon), Afternoon (Noon to 4pm), Evening (4pm to 8pm), Evening-night (8pm to Midnight), Night (Midnight to 4am). Reference for periods of day: 4am to 8am. Industry F.E. include the following categories: Mining; Construction; Manufacturing; Wholesale and retail trade; Transportation and utilities; Information; Financial activities; Professional and business services; Educational and health services; Leisure and hospitality; Other services; Public administration (ref: Agriculture, forestry, fishing, and hunting). Occupation F.E. include the following categories: Professional and related; Service; Sales and related; Office and administrative support; Farming, fishing, and forestry; Construction and extraction; Installation, maintenance, and repair; Production; Transportation and materials moving (ref: Management, business, and financial). * Significant at the 90%. ** Significant at the 95%. *** Significant at the 99%.

Figure A1. Estimated differences in leisure and non-paid work between male and female teleworkers and commuters, by period of time



Note: The sample (ATUS 2003-2015) has been restricted to employees who devote at least 60 minutes to work activities during the diary day (excluding commuting). The self-employed are not included in the sample. Teleworkers are defined as those workers who do not commute to/from work.

Table A1. Matrix of correlations

	MEN															
	WOMEN															
Teleworker	-	-0.271	0.061	-0.047	-0.021	0.048	0.007	0.042	0.015	0.010	-0.007	-0.019	-0.002	0.010	-0.024	-0.006
Minutes at market work	-0.305	-	0.065	-0.056	-0.056	0.084	0.006	0.029	0.013	0.010	-0.007	-0.019	0.008	0.022	-0.045	0.009
Age	0.041	0.048	-	-0.083	-0.057	0.103	0.024	0.034	0.303	0.206	-0.138	-0.156	0.093	0.047	0.041	-0.013
Primary ed.	-0.026	-0.038	-0.051	-	-0.230	-0.382	0.034	-0.312	-0.028	-0.107	0.120	0.162	-0.079	-0.092	0.012	-0.014
Secondary ed.	-0.043	-0.070	0.052	-0.165	-	-0.812	0.006	0.045	-0.054	-0.051	-0.028	0.014	-0.026	-0.053	0.161	-0.124
University ed.	0.053	0.085	-0.024	-0.351	-0.866	-	-0.026	0.144	0.068	0.113	-0.045	-0.110	0.072	0.106	-0.160	0.126
Being white	-0.004	0.009	0.028	-0.013	-0.005	0.011	-	0.159	0.080	0.064	0.012	0.011	0.013	0.043	0.015	-0.075
Being American	0.022	0.030	0.014	-0.227	0.012	0.104	0.180	-	-0.049	0.074	-0.140	-0.193	-0.006	0.031	0.014	-0.140
Live in couple	0.011	0.023	0.161	-0.067	-0.010	0.044	0.149	-0.032	-	0.642	0.338	0.338	0.138	0.112	0.001	-0.030
Partner labor status	0.002	0.023	0.063	-0.080	-0.040	0.079	0.148	-0.021	0.824	-	0.118	0.138	0.101	0.070	0.005	-0.019
Number of children	0.006	-0.005	-0.259	0.128	0.014	-0.078	-0.052	-0.114	0.117	0.125	-	0.789	0.028	0.030	-0.017	-0.006
Family size	-0.002	-0.008	-0.247	0.129	0.046	-0.109	-0.022	-0.176	0.227	0.205	0.771	-	-0.017	-0.010	-0.014	0.020
Full-time worker	-0.020	-0.011	0.067	-0.100	-0.029	0.078	-0.019	0.020	0.006	0.006	-0.110	-0.119	-	0.208	0.040	-0.003
Scheduled work hours	-0.003	0.019	0.014	-0.075	-0.064	0.099	-0.005	0.036	-0.030	-0.021	-0.078	-0.096	0.349	-	-0.071	-0.003
Hourly earnings	-0.041	-0.064	0.070	-0.021	0.051	-0.037	0.002	0.035	0.017	0.009	0.006	-0.001	0.006	-0.054	-	-0.052
Metropolitan status	0.012	0.022	-0.028	-0.006	-0.089	0.088	-0.072	-0.126	-0.057	-0.038	-0.014	0.003	0.023	0.008	-0.029	-

Note: The sample (ATUS 2003-2015) has been restricted to employees who devote at least 60 minutes to work activities during the diary day (excluding commuting). The self-employed are not included in the sample. Variables are ordered in the same column as in the same row. The lower part of the matrix represents correlates for female workers. The upper part of the matrix represents correlates for male workers.

Table A2. Estimates on the daily minutes of leisure, and non-paid work

VARIABLES	LEISURE TIME		NON-PAID WORK TIME	
	(1) Male	(2) Female	(3) Male	(4) Female
Being a teleworker	32.51*** (2.583)	34.71*** (2.814)	18.78*** (2.353)	26.95*** (2.780)
Age	-2.742*** (0.544)	-1.665*** (0.506)	0.545 (0.401)	1.783*** (0.508)
Age squared	2.679*** (0.622)	1.834*** (0.587)	-0.241 (0.471)	-1.136* (0.603)
Secondary ed.	1.895 (3.183)	3.012 (3.241)	6.533*** (2.389)	-11.22*** (3.952)
University ed.	5.718* (3.249)	1.110 (3.227)	10.87*** (2.429)	-13.31*** (3.955)
Being white	-0.0111 (2.554)	5.553*** (1.789)	2.526 (1.666)	2.912 (1.980)
Being American	6.194*** (2.194)	3.454 (2.124)	-3.420** (1.693)	-18.92*** (2.332)
Live in couple	1.208 (2.451)	7.749*** (2.718)	1.285 (1.928)	17.08*** (3.034)
Couple labor status	-3.969** (1.715)	-5.517** (2.538)	2.382 (1.534)	6.053** (2.911)
N. of children	-6.120*** (1.632)	-5.176*** (1.267)	1.063 (1.021)	0.247 (1.294)
Family size	4.009*** (1.398)	1.372 (1.022)	-1.678** (0.797)	0.913 (1.022)
Full time worker	-4.582** (2.255)	-3.783** (1.643)	0.616 (1.726)	-6.245*** (1.776)
Scheduled work hours	-0.317*** (0.0550)	-0.367*** (0.0631)	-0.264*** (0.0508)	-0.540*** (0.0686)
Log-hourly earnings	-1.011 (0.651)	-0.192 (0.528)	-0.209 (0.484)	-0.470 (0.589)
Metropolitan status	-4.673** (2.234)	-1.109 (1.988)	0.410 (1.747)	-0.793 (2.197)
Constant	167.7*** (16.35)	94.63*** (15.38)	112.5*** (11.30)	166.7*** (17.61)
State F.E.	Yes	Yes	Yes	Yes
Industry F.E.	Yes	Yes	Yes	Yes
Occupation F.E.	Yes	Yes	Yes	Yes
Observations	21,529	20,708	21,529	20,708
R-squared	0.040	0.037	0.032	0.074

Note: Robust standard errors in parentheses. The sample (ATUS 2003-2015) has been restricted to employees who devote at least 60 minutes to work activities during the diary day (excluding commuting). The self-employed are not included in the sample. Teleworkers are defined as those workers who do not commute to/from work. The dependent variable is the daily minutes devoted to leisure (Columns (1) and (2)), or to non-paid work (excluding commuting) (Columns (3) and (4)).

* Significant at the 90%. ** Significant at the 95%. *** Significant at the 99%.

Table A3. Conditional correlations between being a teleworker and doing work activity, by time band

A. MALES

VARIABLES	0-1 am (Midnight)	1-2 am	2-3 am	3-4 am	4-5 am	5-6 am	6-7 am (6am)	7-8 am	8-9 am	9-10 am	10-11 am	11-12 am
Being a teleworker	0.0204*** (0.00682)	0.0115* (0.00598)	0.00899 (0.00579)	0.00781 (0.00586)	0.0225*** (0.00771)	-0.0135 (0.00925)	-0.0643*** (0.0114)	-0.141*** (0.0122)	-0.184*** (0.0117)	-0.195*** (0.0118)	-0.205*** (0.0117)	-0.202*** (0.0117)
Observations	22,857	22,857	22,857	22,857	22,857	22,857	22,857	22,857	22,857	22,857	22,857	22,857

VARIABLES	12-1 pm (Noon)	1-2 pm	2-3 pm	3-4 pm	4-5 pm	5-6 pm	6-7 pm (6pm)	7-8 pm	8-9 pm	9-10 pm	10-11 pm	11-12 pm
Being a teleworker	-0.184*** (0.0124)	-0.197*** (0.0121)	-0.202*** (0.0120)	-0.196*** (0.0126)	-0.142*** (0.0128)	-0.0617*** (0.0122)	0.000322 (0.0107)	0.0320*** (0.0103)	0.0377*** (0.00955)	0.0395*** (0.00938)	0.0281*** (0.00833)	0.0342*** (0.00869)
Observations	22,857	22,857	22,857	22,857	22,857	22,857	22,857	22,857	22,857	22,857	22,857	22,857

B. FEMALES

VARIABLES	0-1 am (Midnight)	1-2 am	2-3 am	3-4 am	4-5 am	5-6 am	6-7 am (6am)	7-8 am	8-9 am	9-10 am	10-11 am	11-12 am
Being a teleworker	0.00588 (0.00530)	-0.00283 (0.00396)	-0.00433 (0.00376)	-0.00478 (0.00396)	0.0297*** (0.00703)	0.0162** (0.00823)	-0.00587 (0.0104)	-0.111*** (0.0127)	-0.212*** (0.0129)	-0.224*** (0.0126)	-0.227*** (0.0127)	-0.238*** (0.0126)
Observations	22,145	22,145	22,145	22,145	22,145	22,145	22,145	22,145	22,145	22,145	22,145	22,145

VARIABLES	12-1 pm (Noon)	1-2 pm	2-3 pm	3-4 pm	4-5 pm	5-6 pm	6-7 pm (6pm)	7-8 pm	8-9 pm	9-10 pm	10-11 pm	11-12 pm
Being a teleworker	-0.212*** (0.0130)	-0.221*** (0.0129)	-0.213*** (0.0129)	-0.203*** (0.0130)	-0.164*** (0.0131)	-0.0737*** (0.0122)	0.00752 (0.0112)	0.0325*** (0.0103)	0.0479*** (0.00955)	0.0524*** (0.00965)	0.0344*** (0.00817)	0.0390*** (0.00857)
Observations	22,145	22,145	22,145	22,145	22,145	22,145	22,145	22,145	22,145	22,145	22,145	22,145

Note: Robust standard errors in parentheses. The sample (ATUS 2003-2015) has been restricted to employees who devote at least 60 minutes to work activities during the diary day (excluding commuting). The self-employed are not included in the sample. Teleworkers are defined as those workers who do not commute to/from work. We estimate the following Ordinary Least Squares: $W_{ij} = \alpha + \beta X_i + \varepsilon_{ij}$, where W_{ij} represents a dummy variable indicating whether the worker “ i ” is doing a market work activity (1) or not (0) in time band “ j ” (j = “Midnight”, ..., 11pm). The vector X_i includes socio-demographics characteristics of workers, which are the following: being a teleworker, being male, age, age squared, secondary ed., University ed., being white, being American, live in couple, couple labor status, n. of children, family size, full-time worker, scheduled work hours, log-hourly earnings, metropolitan, and State, industry and occupation F.E. Results for the variables X_i are available upon author request.

* Significant at the 90%. ** Significant at the 95%. *** Significant at the 99%.