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Work-Care Balance over the Day and the Gender Wage Gap[†]

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Balancing work and household care is a challenge in modern societies, especially for workers with children. Recent literature highlights the importance of the lack of flexible work arrangements and the demand for long hours in certain occupations in explaining the gender wage gap. Important contributions are Goldin (2014), Erosa et al. (2017), Gicheva (2013), Cha and Weeden (2014), Cortes and Pan (2016a, b), Duchini and Effenterre (2017), and Wasserman (2019). In Cubas, Juhn and Silos (2019), we focus on the timing of labor supplied during the day and its interaction with home care responsibilities. Using the American Time Use Survey (ATUS), we document that women have more household care responsibilities than men and that there are occupations that require coordination of production. These occupations pay more but penalize work hours missed due to household care. In this paper, we expand this analysis by measuring the incidence of household care activities between 8 am and 5 pm (prime time of the day). Women experience more work interruptions during that time. These work interruptions are penalized. Among men, the penalty is about 9 percent, declining to 4 percent when we control for occupations. This result is consistent with occupations offering more flexibility but also a lower wage. As in Cubas, Juhn, and Silos (2019), we offer suggestive evidence that missing work due to household demands has a larger penalty in occupations with more coordinated work schedules.

I. Data

We base our analysis on the 2003–2018 ATUS. One respondent per household is drawn from the Current Population Survey (CPS) samples, and the interviews are conducted two to five months after the last CPS interview. The ATUS respondent is asked to fill out a time diary over the previous day, recording their activities and starting and ending times. There are 17 aggregate activities, and we focus on 2, "work and work-related activities" (work) and "caring for and helping household members" (household care).[1] For each individual, we calculate minutes spent on these activities for each hour of the day using information on starting and ending times. The ATUS also contains demographic and labor force information including labor force status and usual hours worked. We restrict our sample to adults who are 18 to 65 years old, who report working full-time in the CPS (usual hours $\geq$ 35). We do not make restrictions based on self-employment status and also include multiple job holders. Our main sample of time-diary respondents consists of 95,572 observations. The online Appendix contains more detail regarding construction of our data.

II. Timing of Work and Household Care over the Day

In this section, we describe patterns of time use over the course of a single workday for full-time workers by gender. To highlight the difference in demands for family time, we select men and women who are married (with spouse

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[1]We downloaded the ATUS from IPUMS using the "create variable from scratch" option, selecting "work and work-related activities" (050000–060000) and "caring for and helping household members" (030000–040000) by time of day (specifying beginning and ending times) and also by site (workplace, home, other). We note that "work" does not include travel or commuting time, and "household care" does not include housework, which is reported under a separate category.

Table 1—Gender Gap in Work and Household Care

	Day dummies (1)	+ Dem. controls (2)	+ Usual hours (3)	+<50 hours (4)
Panel A. Working hours				
Female gap in work hours	−0.746	−0.742	−0.317	−0.279
	(0.0424)	(0.0429)	(0.0415)	(0.0427)
Observations	16,073	16,073	16,073	16,073
Average hours, men	8.691			
Average hours, women	7.943			
Average hours, total	8.441			
Panel B. Household care				
Female gap in household care hours	0.388	0.387	0.310	0.272
	(0.0196)	(0.0196)	(0.0190)	(0.0194)
Observations	16073	16073	16073	15483
Average hours, men	0.726			
Average hours, women	1.114			
Average hours, total	0.856			
Panel C. Household care in prime time				
Incidence of household care 8 to 5	0.150	0.150	0.135	0.117
	(0.00755)	(0.00755)	(0.00757)	(0.00787)
Observations	14,386	14,386	14,386	13896
Average, men	0.197			
Average, women	0.347			
Average, total	0.246			

Notes: The table is based on ATUS respondents who are 18–65 years old, who report usual weekly hours >=35 in the CPS, who are married with at least one child in the household, and whose diary day is a weekday. "Work" corresponds to hours spent on "work and work-related activities," which does not include travel or commuting time. "Household care" corresponds to hours spent on "caring for and helping household members," which does not include housework. "Incidence of household care 8–5" is equal to one if the respondent reported nonzero household care between 8 AM and 5 PM. For work and household care hours, we restrict the sample to those who report nonzero time spent on work-related activities. For the incidence measure, we restrict the sample to those who report nonzero time spent on work-related activities at the work site. Each column reports the coefficient on the "female" dummy with various controls. Column 1 includes day and year fixed effects. Column 2 includes age, education category, and race fixed effects. Column 3 adds usual weekly hours reported in the CPS. Column 4 only includes workers who reported usual weekly hours of less than 50.

Source: Data are from the 2003–2018 ATUS

present) and who have at least one child under the age of 18 in the household. We select respondents whose diary day is a weekday and report nonzero time spent on work-related activities.

Panel A of Table 1 shows the gender differences in work time during a workday. Each column reports the coefficient on the "female" dummy with various controls. Our baseline estimates reported in column 1 include day and year fixed effects. The table shows that women work approximately 0.75 hours less on a workday during the week. Column 2 includes demographic controls such as age, education, and race fixed effects. Adding basic demographic controls does not make much of a difference. Column 3 adds usual weekly hours reported in the CPS. Column 4 only includes workers who reported usual weekly hours of less than 50. Both of these restrictions reduce the gap in hours worked, but even among full-time workers who work less than 50 hours, married women with children work 0.28 hours less than their male counterparts. Panel B of Table 1 shows the gender differences in household care time during a workday. The table shows that women allocate approximately 0.4 hours more on average to household care activities. Different controls reduce the gap, but the table shows that women allocate significantly more time to household care than men, even among those who are not working long hours.

So far we have shown that while time allocated to work and household care differs between men and women, the differences are small. This is

perhaps not too surprising given that we have selected on full-time workers. In our other work (see Cubas, Juhn, and Silos 2019), which echoes the results in Stewart (2010), we find that full-time working mothers spend very little time in routine childcare but spend similar amounts of time as nonworking mothers in "other" care activities, which include "organizing and planning for household children," "attending children's events," and "picking up and dropping off children," etc. This type of childcare activities does not constitute a lot of hours but may not be easily outsourced. These activities may also have very little temporal flexibility and come at inopportune times during the workday. In other words, these care activities may prohibit being at work when others are at work, resulting in productivity losses.

In Table 1, panel C, we report the gender difference in the incidence of household care during prime working time, the time interval from 8 AM through 5 PM. "Incidence of household care 8–5" is equal to one if the respondent reported nonzero household care between 8 AM and 5 PM. To highlight the interruption in work activity, we restrict the sample to those who report nonzero working time at the work site. This excludes workdays that are conducted entirely at home. The table reports that among women who are at the work site on a workday, 35 percent conduct some household care activity during the 8 to 5 interval. The comparable number for men is 20 percent. Married men with children also experience these work interruptions but to a much lesser degree than women.

III. The Price of Household Care during Prime Time

Do these interruptions come at a cost? To answer this question, we investigate how wages are related to work interruptions using only the sample of married men with children. In Table 2, we regress log hourly wage on the incidence of household care during prime time. Log hourly wage is constructed by dividing weekly earnings reported in the CPS by usual (total) hours worked last week. Weekly earnings that are top coded are recoded as 1.5 times the top-code value. The weekly earnings measure we use is reported for only wage and salary workers, so this table excludes self-employed workers. In the regression, we also include fixed effects for single years of age, education, race, and years. All regressions are weighted using ATUS weights. Additionally, we also control for usual weekly hours reported in the CPS survey for these respondents. Our sample here conditions on men who report working at the work site. As has been shown by Denning et al. (2019) and others, the return on usual hours estimated via OLS is negative. As shown in column 1, incidence of household care activity during the 8 to 5 time interval—our work interruption measure—has a significant and large wage penalty of 8.7 log points. In column 2, we add three-digit census 2002 occupation controls. The wage penalty is reduced to 3.9 log points. The reduction in the penalty is consistent with compensating differentials across occupations where greater flexibility to take time off during the day comes at the cost of a lower wage. It may also be due to differences in skill levels across occupations with greater or lower incidence. How is this related to the gender wage gap? Since women report greater

Table 2—The Price of Household Care during Prime Time

Dependent variable: log hourly wage	Baseline (1)	Occupation dummies (2)
Incidence of household care 8 to 5	−0.0867	−0.0390
	(0.0144)	(0.0154)
Usual weekly hours	−0.0105	−0.0107
	(0.000603)	(0.000951)
Observations	7,937	7,937

Notes: The table is based on male respondents who are 18–65 years old, who report usual weekly hours $\geq$35 in the CPS, who are married with at least one child in the household, and whose diary day is a weekday. We also restrict the sample to those who report nonzero time spent on work-related activities at the work site during the diary day. Log hourly wage is constructed by dividing weekly earnings reported in the CPS by usual (total) hours worked last week. Weekly earnings that are top coded are recoded as 1.5 times the top-code value. The weekly earnings measure we use is reported only for wage and salary workers, so this table excludes self-employed workers. The regression also includes fixed effects for single years of age, detailed education categories, detailed race categories, and years. Column 2 includes dummies for three-digit census 2002 categories, and standard errors are clustered at the occupational level. All regressions are weighted using ATUS weights.

Source: Data are from the 2003–2018 ATUS

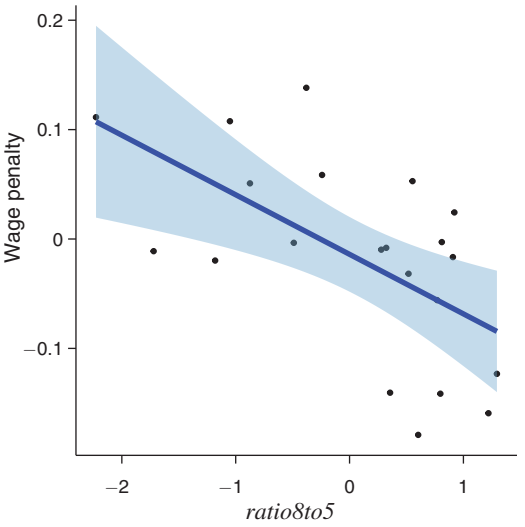

FIGURE 1. THE PRICE OF HOUSEHOLD CARE AT PRIME TIME AND THE COORDINATION OF WORK BY OCCUPATION

Notes: The graph depicts the cross-occupation relationship between the wage penalty associated with the incidence of household care and the degree of coordinated works schedules for 21 occupations. Each dot in the figure represents an occupation. The vertical axis measures the within-occupation effect of the incidence of household care during prime time ("wage penalty"). The horizontal axis measures the occupation-specific *ratio8to5*. This variable represents the fraction of work that takes place between 8 AM and 5 PM. The fractions are standardized so they have a mean of zero and a standard deviation of one. The figure also shows a regression line (with 95 percent confidence intervals) of the wage penalty on *ratio8to5*.

Source: Data are from the 2003–2014 ATUS

incidence of conducting household care during prime time relative to their male counterparts, we would predict a larger gender wage gap due to these mechanisms.

The results in Table 2 showed that even within occupations, there is a substantial penalty for men who do household care during prime time. We explore whether this within-occupation wage penalty may be related to coordinated work schedules. In other words, is the penalty of missing work particularly large when others are at work? In Cubas, Juhn, and Silos (2019), we introduced a measure of coordinated work schedules at the occupation level using the time-use survey. Our measure, *ratio8to5*, is the ratio of total hours worked during prime time—8 to 5—to total hours worked in the occupation.[2]

In Figure 1, we plot the within-occupation wage penalty associated with household care incidence against this coordination measure, *ratio8to5*. Given the relatively small sample sizes of the ATUS, we aggregate occupations to 21 categories according to the 2002 Standard Occupation Codes.[3] More specifically we rerun the regression described in Table 2 interacting the 22 occupation dummies with our household care incidence measure. Figure 1 shows a clearly negative relationship. Across occupations, the penalty associated with household care is higher if work activity is more concentrated during prime-time hours. In Cubas, Juhn, and Silos (2019), we build and calibrate a general equilibrium model with these key elements. We find that the mechanisms similar to what we outline here can account for approximately 30 percent of the within-occupation gender wage gap.

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[2] Our measure of coordinated work schedules is calculated as follows. Call the time intervals between 12 AM and 8 AM, between 8 AM and 5 PM, and between 5 PM and 12 AM A, B, and C, respectively. Let A_j, B_j, and C_j refer to the sum of minutes worked by workers in occupation j in those respective intervals. The ratio *ratio8to5* is defined as $ratio8to5_j = B_j/(A_j + B_j + C_j)$.

[3] The number of two-digit codes is 22, but we drop 1 occupation due to its small sample.

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