# Coordinated Work Schedules and the Gender Wage Gap

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**Abstract**

This paper studies how constraints in labor supply driven by differences in the need to coordinate schedules across jobs, contribute to the gender wage gap. Using U.S. time diary data we construct occupation-level measures of coordinated work schedules based on the concentration of hours worked during peak hours of the day. A higher degree of coordination is associated with higher wages but also a larger gender wage gap. In the data women with children allocate more time to household care and are penalized by missing work during peak hours. An equilibrium model with these key elements generates a gender wage gap of 8.9 percent or approximately 40 percent of the wage gap observed among married men and women with children. As in the data, most of the gender wage gap is within occupations: the value predicted by the model is 7.2 percent. If the need for coordination is equalized across occupations and set to a relatively low value (i.e. Health care support), the gender gap within occupations would fall by more than half to 2.0 percent.

*Key words:* Labor Supply, Occupations, Coordination, Work Schedules, Time Use, Gender Wage Gap.
*JEL Classifications:* J2, J3, E2.

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# 1 Introduction

Balancing work and family is a challenge in modern societies. Household production not only limits the total number of hours that can be devoted to market work, it may also conflict with *when* hours can be supplied. For example, as long as parents cannot perfectly substitute child care responsibilities across different hours of the day, there will be temporal restrictions on when parents can supply labor. From the perspective of the employer, *when* work happens may be important too if there is joint production and firms need to coordinate workers. The nature of production may require workers to be at work at the same time to perform a joint task, raising the productivity of hours supplied when others are present. To the extent that women have more household care responsibilities than men, and therefore have greater difficulty committing to be present at any particular hour, the need for coordination impacts women more than men. This paper presents a general equilibrium model where the need for coordinating schedules generates gender wage gaps. This model is taken to the data to uncover how much of the gender gaps across and within occupations are explained by this coordination friction.

Using the American Time Use Survey (ATUS), we document novel facts regarding the timing of work for men and women. We find that parents perform household care (child care plus adult care) throughout the day– even during peak hours– suggesting that parents are indeed unable to postpone household production to non-work times. A comparison between men and women, even among full-time workers, shows that women provide more household care and work less throughout the day relative to their male counterparts. The gap in hours is small but our point is that even small gaps can generate productivity losses depending on the timing.

We also employ the ATUS to measure coordinated work schedules at the occupation level. For each occupation, we record at what time of the day individuals report being at work. We associate more bunching (work schedules concentrated at particular times) with stronger coordination needs, because bunching implies that individuals are at work at the same time. We find that the degree of bunching of work hours varies across occupations and, consistent with the notion of coordination, our measure is positively correlated with other occupational characteristics such as "face to face discussions" and "establishing and maintaining interpersonal relationships" reported in the O*NET database.

We then use individual level data from the Current Population Survey (CPS) to study the relationship between wages and our occupational level measure of coordination. We find that our measure of coordination commands a wage premium: a one standard deviation higher ratio leads to approximately 11 percent higher wages. In addition, it generates a gender wage gap: women who work in coordinated occupations are paid a higher wage but relatively less than men (by about 5 percent). Interestingly, we find that married men with full-time working spouses (who presumably have greater household care responsibilities) also experience a wage penalty in high coordination occupations relative to men with non-working spouses.

Motivated by these facts, we develop a theory of occupational choice and time allocation during the day to household care and market work. In the model a gender wage gap is generated by the interaction of three key elements. First, women assign a higher value to household care– an assumption which we justify as a reflection of current social norms. Since household care activities performed at different times are less than perfect substitutes, women end up allocating more time to household care when everyone else is working, which is costly. This penalty rises with the occupational coordination needs so women are less likely to select into occupations with higher coordination needs.

We parameterize the model with the data used in the empirical analysis. We restrict the sample to married men and women with children who are full-time workers. The model generates a gender wage gap of 8.9 percent (approximately 40 percent of the observed gender gap). We decompose the gender wage gap into the between and within occupation components. As in the data, most of the gender wage gap is within occupations. The within component predicted by the model is 7.2 percent which accounts for 30 percent of the one observed in the data.

To understand the extent to which occupational differences in coordination are responsible for the observed gender gap we conduct a counterfactual exercise where coordination needs are equal across all occupations and set to the level of "Healthcare Support"— an occupation with a relatively low level of coordination. In this case, the overall gender wage gap in the model falls to 6.4 percent. The gender wage gap within occupations decreases by 72 percent to 2.0 percent. In another counterfactual, we reduce the difference in the value that men and women place on household care. We can think of this experiment as a way to evaluate changes in social norms that drive a reduction in the gender gap in household care responsibilities. As a result, the gender wage gap within occupations decreases by 50 percent to 3.6 percent. Finally, we focus our study on the effects of the ability to substitute household care during the day. Our baseline calibration points to an economy in which household care activities are fairly substitutable but imperfectly so. They may reflect parenting styles or just constraints on the time of the day in which some activities take place (for example meetings with school teachers). We thus analyze a counterfactual economy in which women can now more easily distribute the household care to off-peak times so they do not incur a productivity loss. As a result, the gender wage gap within occupations decreases by 31 percent to 5 percent.

A large literature in macroeconomics and labor economics relates family arrangements and the labor supply of its family members. Important contributions are Doepke and Tertilt (2016), Bick and Fuchs-Schündeln (2018) and Albanesi and Olivetti (2009). Our paper is also closely connected to the literature which examines the role of frictions on workers' labor supply responses. These frictions could arise from fixed wage-hours packages offered by employers which result in non-linear payment schedules. Important contributions are Prescott, Rogerson, and Wallenius (2009), Rogerson and Wallenius (2009) as well as Rosen (1976), Blundell, Brewer, and Francesconi (2008), Altonji and Paxson (1988) and Altonji and Paxson (1992). Recent papers have emphasized the role of coordination as the driving force behind non-convex budget sets. The wage-hours combinations available to workers may be sparse due to the needs for coordination. This need may arise at the firm level or even at a more aggregate, economy-wide level. For example, Guner, Kaya, and Sánchez-Marcos (2014) study how the Spanish work schedule with long lunch breaks affects parental time allocation. Moreover, Guner, Kaya, and Sánchez Marcos (2019) find that the inflexibility of work schedules partially explains the low fertility observed in some rich countries. Other recent papers study the labor supply responses to changes in, for instance, taxes or other economic conditions. They find stark differences between responses with non-linear payment schedules and those predicted by linear payment schedules and an absence of coordination. Examples include Chetty, Friedman, Olsen, and Pistaferri

(2011), Rogerson (2011), and Labanca and Pozzoli (forthcoming). We contribute to this literature by exploring how coordination requirements influence labor supply as well as another important margin – occupational choice. Instead of examining labor supply responses to tax changes, we examine how these hours requirements driven by coordination needs conflict with the demands of household production and consequently lead to the gender wage gap.[1] Our paper measures the coordination needs indirectly and thus it does not use direct evidence on the coordination technology in production. However, recent work provide evidence on the coordination and transmission of complex information between coworkers in specific production processes and working environments. Examples are Labanca and Pozzoli (forthcoming), Gibbs, Mengel, and Siemroth (2021) and Battiston, Blanes i Vidal, and Kirchmaier (2020).

Our work is also closely related to the literature which relates occupation-specific characteristics to the gender wage gap. Goldin (2014) argues that much of the remaining gender wage gap can be explained by the lack of flexible work arrangements. Along these lines, a number of papers have shown that the gender gap is particularly large in jobs which demand long hours (Erosa, Fuster, Kambourov, and Rogerson (2017), Gicheva (2013) Cha, Youngjoo, and Kim A. Weeden (2014), Cortes, Patricia, and Jessica Pan (2016b), Cortes, Patricia, and Jessica Pan (2016a), Duchini and Effenterre (2017) and Wasserman (2019)).[2] Compared to these studies, our focus is on flexible timing, rather than the flexibility to set the number of hours. We show that while the demand for long hours and our measure of

[1]Our occupational choice model integrates the timing of work with the timing of household care in a unified framework where family responsibilities play a key role. This feature differentiates our work from previous work which study the timing and synchronization of works schedules. Examples of these studies are Hamermesh (1999) and Cardoso, Hamermesh, and Varejao (2012), Weiss (1996) and Eden (2017).

[2]The requirement for long hours has been also associated with less flexible work schedules. Thus our work also relates to Wiswall and Zafar (2017), Goldin and Katz (2011), and Flabbi and Moro (2012).

coordination are positively correlated, the correlation is far from perfect and both contribute to the gender wage gap.[3]

A recent paper, Mas and Pallais (2017), elicit workers' willingness to pay for flexible schedules using a field experiment. These authors find that while the average willingness to pay for flexibility is low, there is also a long right tail in the willing to pay distribution suggesting compensating differential for inflexibility still could be large at the margin.[4] Another recent paper, Chen, Chevalier, Rossi, and Oehlsen (2019), estimates the value of flexibility among drivers of the ride-sharing platform Uber. Drivers have almost total flexibility when to supply labor, to the point of being able to react on an hourly basis to unexpected shocks to their reservation wage. The authors estimate the surplus from that flexibility to be large, and hence their results are roughly in line with our findings.

The paper is organized as follows. Section 2 describes our data, the temporal patterns of work and household care in the ATUS, as well as our measure of hours bunching which proxies for coordination requirements. Section 3 presents the model. Section 4 illustrates the model mechanics with simple examples. Section 5 reports our reduced form regression results using individual level CPS data. Section 6 describes the calibration and our counterfactual experiments. Section 7 concludes.

[3]A recent paper by Denning, Jacob, Lefgren, and vom Lehn (2019) finds that the positive relationship between hours worked and earnings is virtually absent within occupations and it is only observed across occupations. This finding suggests that the hours gap between men and women cannot account for the within-occupation gender wage gap if this hours penalty is applied. In our paper we show that differences in the within-occupation gender wage gap can be large even when the gender hours gap is small.

[4]They also find that workers particularly dislike working evening and weekend shifts which at first appears to be counter to our story. Occupations which require evening and weekend shifts (such as security guards) may appear to be flexible in terms of our bunching measure but this may just be a reflection of a 24 hour production cycle. To address this issue, we rerun our regressions controlling for the share of workers who are shift workers in the occupation. We find our results are robust to adding these additional controls.

# 2 Time Allocation by Gender, and Coordinated Work Schedules

## 2.1 Data

We base our analysis on the 2003-2014 ATUS. One respondent per household is drawn from the Current Population Survey samples and the interviews are conducted 2 to 5 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 two activities, "work and work-related activities" and "caring for and helping household members".[5] 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. Our main sample of time-diary respondents consists of 106,620 observations. For comparing time use of men and women we focus on full-time workers (those whose usual weekly hours are greater than or equal to 35).[6] The full-time worker sample consists of 66,023 observations. We do not make restrictions based on self-employment status and also include multiple job holders. However, to construct the ratio of hours worked in the 8 to 5 time interval (which we label *ratio8to5*) at

[5]We do not include the aggregate category, "household activities", which includes housework. If we include "household activities", the gender gap is considerably larger. In most of our analysis we take a conservative route by restricting our attention to the aggregate category "caring for and helping household members" which only includes child care and elder care reported as the primary activity. In Table 3 we also explore a more expanded definition of child care such as "socializing and communicating" when a child is present.

[6]The fact that women are more likely to work part-time and part-time workers are paid a lower hourly wage is well-established. We focus on full-time workers in our study to push home our point that schedules and when work happens matters for hourly wages in addition to the number of hours worked.

the occupation level we include only full-time workers who worked a minimum of 35 hours in their main job. For the regression analysis where we explore the impact of occupation-level *ratio8to5* on wages, we include all individuals in the CPS, including those who are not time-use survey respondents. For this case the sample sizes are considerably larger, with the sample consisting of 263,313 individuals who are full-time workers aged 18 to 65 with non-missing weekly wages. Since the time use surveys are conducted 3 months after the main CPS interviews we use variables such as age and work status that are collected at the time of the time use survey whenever possible. Some of the information, however, such as education, is available only in the main CPS data. Appendix A.1 contains more detail regarding construction of our data.

## 2.2 Timing of Work and Household Care

In this section we describe patterns of time use over the course of a single day for full-time workers by gender, marital status and parental status. These patterns show how time allocated to market work is constrained by the demands of family time and how those constraints differ for men and women. Figure 1 explores *when* work happens. The figure graphs the average number of minutes worked by one-hour time bins for full-time workers. The figure shows that most (74 percent) work occurs during the 8 a.m. to 5 p.m. interval with a break between 12 p.m. to 1 p.m.[7] Figure 2 graphs the average number of minutes worked by marital and parental status. The left panel shows work for married individuals, men and women, with at least one own child in the household, who work full-time. The right panel shows work for singles with no children. Even among full-time workers, women work

[7] Average minutes worked per hour is well below 60 which may reflect the fact that we are averaging over all 7 days of the week including weekends. We do not intend to eliminate weekends as work also takes place on those days. In addition, work over weekends varies across occupations.

less than men, with the gap being largest among those married with children. Table 1 further explores the gender differences in work for this group. The table shows that women work approximately 0.9 hours less on weekdays and 0.7 hours less on weekends. Column (5) controls for usual weekly hours worked reported in the activity summary file. Column (6) only includes workers who reported usual weekly hours 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 almost 0.5 hours less on weekdays relative to their male counterparts.

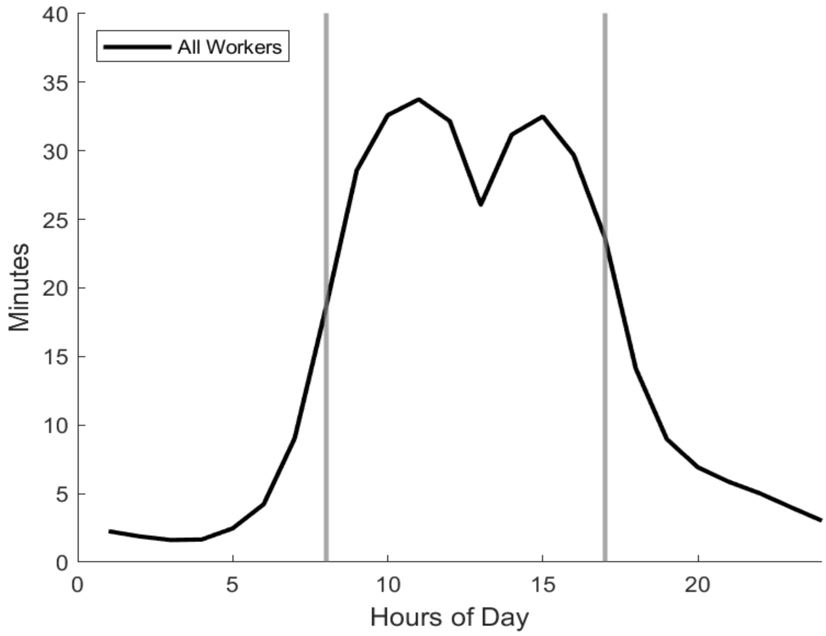


Figure 1: Work among Full-time Workers

Notes: Data are from the 2003-2014 American Time Use Surveys (ATUS). The figure is based on 18-65 year old ATUS respondents who report to be full-time workers in the activity summary file. The figure reports average minutes spent by hour of the day on “work and work-related activities” on the diary day.

Figure 3 graphs the temporal pattern of household care among full time workers who are married with children (left panel) and singles without children (right panel). The differences in the temporal pattern of work and household care, how-

Table 1: Work among Full-time Workers, Married with Children

| | Weekday | Weekend | Weekday | | | |
|---|---|---|---|---|---|---|
| Female Gap in Work Hours | -0.898*** | -0.749*** | -0.901*** | -0.918*** | -0.710*** | -0.492*** |
| | (0.0694) | (0.0674) | (0.0692) | (0.0706) | (0.0702) | (0.0773) |
| Observations | 12113 | 12344 | 12113 | 12113 | 12113 | 8393 |
| Day of Week and Year | | | x | x | x | x |
| Education, Age, Race and # Kids | | | | x | x | x |
| Usual Weekly Hours | | | | | x | x |
| Usual Weekly Hours less than 50 | | | | | | x |
| Average Hours, Men | 7.904 | 2.163 | | | | |
| Average Hours, Women | 7.006 | 1.414 | | | | |
| Average Hours, Total | 7.611 | 1.906 | | | | |

Notes: Data are from the 2003-2014 American Time Use Surveys (ATUS). The table is based on 18-65 year old ATUS respondents who report working full-time in the activity summary file. We keep those who are married with spouse present and have at least one own child in the household. The dependent variable is total hours spent on "work and work-related activities" on the diary day. Each column reports the coefficient on the "female" dummy. Column (5) controls for usual weekly hours worked reported in the activity summary file. Column (6) only includes workers who reported usual weekly hours of less than 50. Individual observations are weighted by ATUS weights for multi-year data files.

ever, are notable. Both women and men with children report household care with noticeable bumps up in the early morning and evening hours. The temporal pattern of care for full-time workers with children is negatively related to the temporal pattern of work, with the fewest minutes devoted to care activities during the 8 to 5 interval. However, even during the 8 to 5 interval, household care does not fall to zero. Table 2 shows that among married men and women with children, women engage in nearly 0.5 hours more household care during weekdays and 0.3 hours more on weekends. Different controls reduce the gap but the table shows that women significantly allocate more time to household care than men.

Table 3 provides further detail regarding differences in hours of child care provided by mothers and fathers. First we examine detailed care categories adopting a

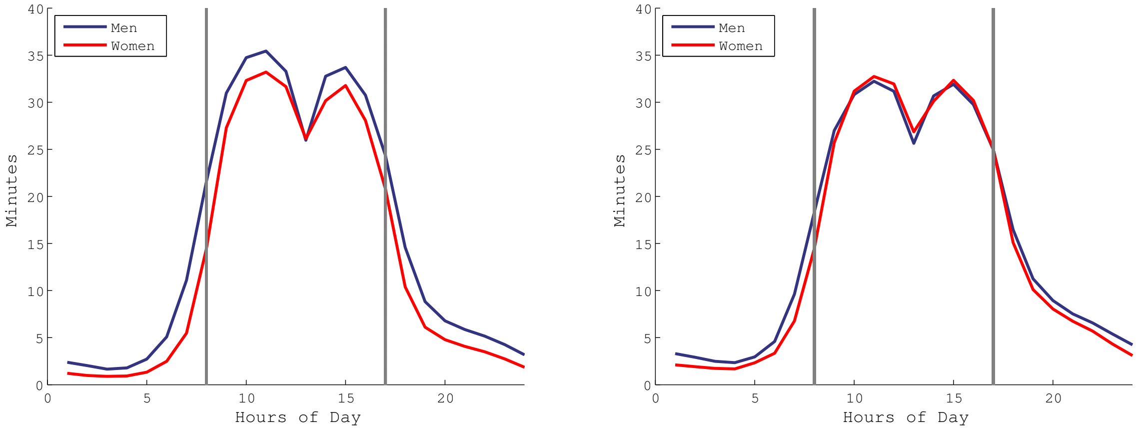


Figure 2: Work among Full-time Workers

Notes: Data are from the 2003-2014 American Time Use Surveys (ATUS). The figure is based on 18-65 year old ATUS respondents who report to be full-time workers in the activity summary file. The figure reports average minutes spent by hour of the day on "work and work-related activities" on the diary day. Both weekdays and weekends are included.

method introduced by Stewart (2010). Stewart (2010) defines three broad categories of child care: "routine", "enriching care", and "other." Included in routine care is physical care and looking after children. "Enriching care" includes activities such as reading to children and playing sports with children. "Other" includes more nebulous activities such as "organizing and planning for household children," "attending children's events," and "picking up and dropping off children." Table A.4 provides the full list of activities included in each of the three broad categories.

Table 3 compares the hours of each type of care performed by non-working married mothers, full-time married mothers, full-time single mothers, and full-time married fathers, respectively. The top panel reports hours during weekdays while the bottom panel reports hours during weekends. The table also separates out households where at least one child is under the age of six (school age). Looking at hours of routine care in families with young children, we see (not surprisingly) that non-working mothers provide the most care, 1.4 hours, while full-time married mothers and full-time single mothers provide 1.0 and 0.8 hours respec-

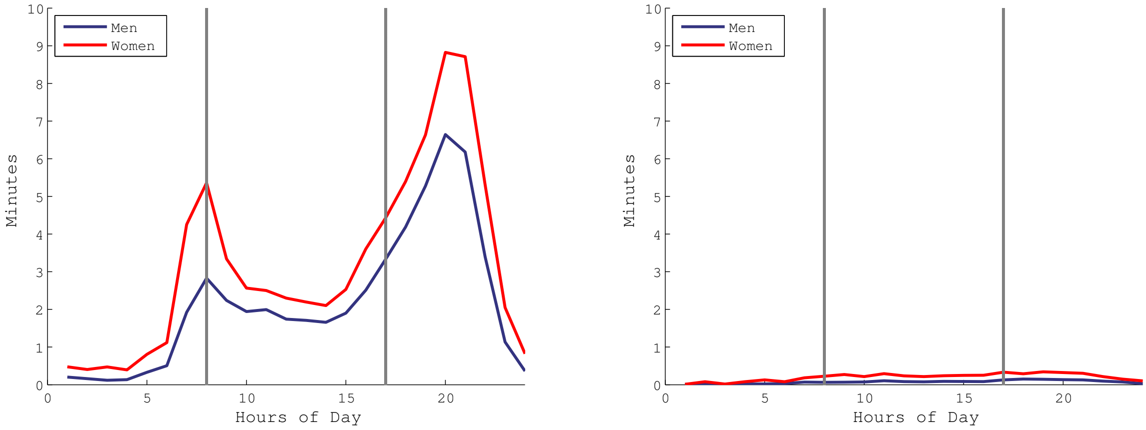


Figure 3: Household Care among Full-time Workers

Notes: Data are from the 2003-2014 American Time Use Surveys (ATUS). The figure is based on 18-65 years old ATUS respondents who report to be full-time workers in the activity summary file. The figure reports average minutes spent by hour of the day on "caring for and helping household members" on the diary day. Both weekdays and weekends are included.

tively. Full-time married fathers provide considerably less, 0.4 hours. What is surprising is that non-working and full-time working mothers provide the same amount of care in the "other" category – all three groups provide 0.4 hours on a typical weekday. There are differences when we examine households with only older children but main point is that the child care provided by non-working and full-time working mothers is not as different as one might have thought, especially when it comes to the non-routine care categories. This type of child care does not constitute a lot of hours but the table shows that certain activities cannot be easily outsourced.

To summarize, we showed that married women with children who are full-time workers report fewer hours of work in the time diary data relative to their male counterparts– a phenomenon we call "missing hours." The "missing hours" occur throughout the day and is distinct from women being less likely to work long hours. Correspondingly, married women with children also perform more household care than men. The extra household care is unlikely to be routine child

Table 2: Household Care among Full-time Workers, Married with Children

| | Weekday | Weekend | Weekday | | | |
|---|---|---|---|---|---|---|
| Female Gap in Household Hours | 0.436*** | 0.264*** | 0.436*** | 0.383*** | 0.353*** | 0.302*** |
| | (0.0276) | (0.0332) | (0.0276) | (0.0270) | (0.0272) | (0.0327) |
| Observations | 12113 | 12344 | 12113 | 12113 | 12113 | 8393 |
| Day of Week and Year | | | x | x | x | x |
| Education, Age, Race and # Kids | | | | x | x | x |
| Usual Weekly Hours | | | | | x | x |
| Usual Weekly Hours less than 50 | | | | | | x |
| Average Hours, Men | 0.821 | 1.002 | | | | |
| Average Hours, Women | 1.257 | 1.267 | | | | |
| Average Hours, Total | 0.963 | 1.093 | | | | |

Notes: Data are from the 2003-2014 American Time Use Surveys (ATUS). The table is based on 18-65 year old ATUS respondents who report working full-time in the activity summary file. We keep those who are married with spouse present and have at least one own child in the household. The dependent variable is total hours spent on "caring for and helping household members" on the diary day. Each column reports the coefficient on the "female" dummy. Column (5) controls for usual weekly hours worked reported in the activity summary file. Column (6) only includes workers who reported usual weekly hours of less than 50. Individual observations are weighted by ATUS weights for multi-year data files.

care since we are considering full-time working women. Instead, the extra hours are likely to consist of a catch-all "other" category which includes such activities as organizing and planning, driving children, attending doctor's appointments and children's activities. These activities add up to a small number of hours but are likely to entail costly work interruptions.

## 2.3 Measure of Coordinated Work Schedules

Building on the previous section, we construct our measure of coordinated work schedules for different occupations. Call the time intervals between 12 a.m. and 8 a.m., between 8 a.m. and 5 p.m. and, between 5 p.m. and 12 a.m. $A$, $B$ and $C$, respectively. $A_{ij}$, $B_{ij}$, and $C_{ij}$ then refer to the sum of minutes worked by

Table 3: Household Care Activities of Parents by Marital and Work Status (Hours)

Panel A: Weekday

| | Females | | | Males |
|---|---|---|---|---|
| Activity | Married NW | Married FT | Single FT | Married FT |
| With Children Aged Less Than 6 | | | | |
| Routine | 1.4 | 1.0 | 0.8 | 0.4 |
| | (0.03) | (0.03) | (0.04) | (0.02) |
| Enrichment | 0.6 | 0.4 | 0.3 | 0.3 |
| | (0.02) | (0.02) | (0.02) | (0.01) |
| Other | 0.4 | 0.4 | 0.4 | 0.1 |
| | (0.01) | (0.01) | (0.02) | (0.01) |
| With Children Aged 6-18 Only | | | | |
| Routine | 0.4 | 0.2 | 0.2 | 0.1 |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Enrichment | 0.6 | 0.4 | 0.3 | 0.3 |
| | (0.02) | (0.01) | (0.02) | (0.01) |
| Other | 0.4 | 0.2 | 0.3 | 0.1 |
| | (0.01) | (0.01) | (0.01) | (0.01) |

Panel B: Weekend

| | Females | | | Males |
|---|---|---|---|---|
| Activity | Married NW | Married FT | Single FT | Married FT |
| With Children Aged Less Than 6 | | | | |
| Routine | 1.0 | 0.9 | 0.7 | 0.4 |
| | (0.02) | (0.02) | (0.03) | (0.02) |
| Enrichment | 0.4 | 0.4 | 0.3 | 0.3 |
| | (0.02) | (0.02) | (0.02) | (0.01) |
| Other | 0.1 | 0.1 | 0.1 | 0.1 |
| | (0.01) | (0.01) | (0.01) | (0.00) |
| With Children Aged 6-18 Only | | | | |
| Routine | 0.2 | 0.1 | 0.1 | 0.1 |
| | (0.01) | (0.01) | (0.01) | (0.00) |
| Enrichment | 0.5 | 0.4 | 0.4 | 0.3 |
| | (0.02) | (0.01) | (0.02) | (0.01) |
| Other | 0.1 | 0.1 | 0.1 | 0.1 |
| | (0.01) | (0.01) | (0.01) | (0.00) |

Note: Data are from the 2003-2014 American Time Use Surveys (ATUS). The table shows the average hours allocated to household care activities by parents. See main text for the definitions of the main activities. See Appendix for detailed activities that are included in each category. Married NW refers to married women with spouse present who are not working, Married FT refers to men and women who are married with spouse present and working full-time, Single FT refers to single women who are working full-time.

individual $i$ in occupation $j$ in those respective intervals. We sum over individuals to get occupation-level equivalents

$$A_j = \sum_{i=1}^{M_j^A} w_i A_{ij}, \quad B_j = \sum_{i=1}^{M_j^B} w_i B_{ij}, \quad C_j = \sum_{i=1}^{M_j^C} w_i C_{ij}$$

where $w_i$ refers to the survey weight of the individual and, $M_j^A$, $M_j^B$ and $M_j^C$ are the number of individuals in occupation $j$ in intervals $A$, $B$ and $C$, respectively.

Our measure of coordinated work schedules at the occupation level is the ratio of minutes worked in the 8 to 5 interval relative to total minutes worked.

$$ratio8to5_j = \frac{B_j}{A_j + B_j + C_j}.$$

We include only full-time workers in calculating this ratio. A higher ratio indicates that a greater amount of work in the occupation occurs during the standard 8 to 5 work day. We also standardize this measure by subtracting the mean and dividing by the standard deviation. We view a higher ratio as indicating the need for greater coordination, with more hours worked concentrated during peak hours. We construct ratios by detailed 2002 Census occupations, resulting in 493 non-missing ratios (see Table A.7). Appendix A.1 provides further details on the construction of the ratios.

We highlight some occupations in Figure 4. Among occupations with more educated workers, “Lawyers” and “Financial Analysts” have standardized ratios of 0.588 and 0.663, respectively. “Writers and Authors” have a relatively low ratio of 0.157. “Physicians and Surgeons" have the lowest ratio of -0.010. In occupations with relatively less educated workers “Nursing, Psychiatric, and Home Health Aides” has a very low ratio of -1.284. “Cashiers” have a ratio of -0.781. On the other hand, "Secretaries and Administrative Assistants" have a high ratio of 1.052.

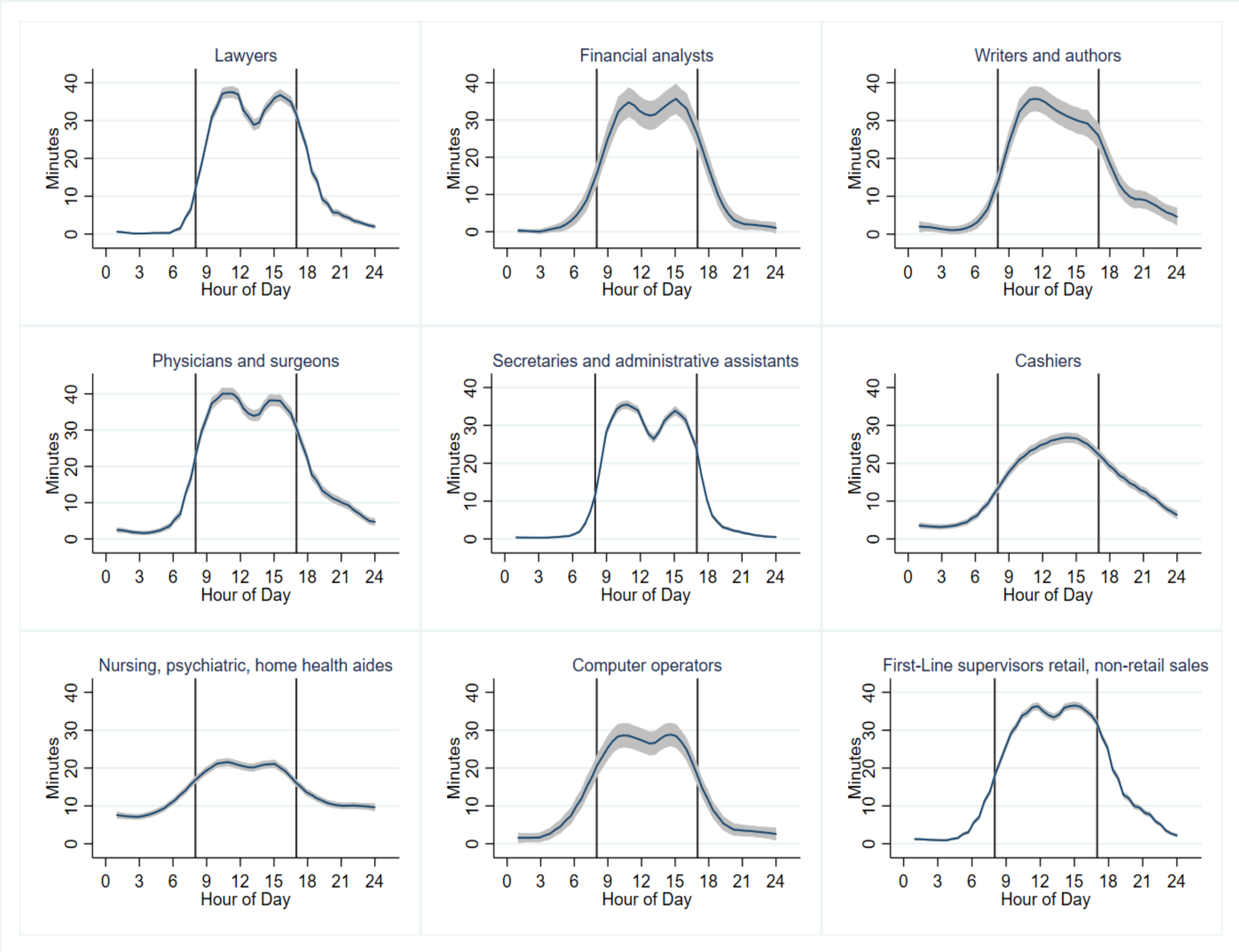


Figure 4: Timing of Work in Selected Occupations

Notes: The figures show smoothed values from local polynomial regressions of minutes spent by hour of the day on "work and work-related activities" for different occupations. Shaded areas display confidence intervals. Both weekdays and weekends are included.

How is our measure related to other occupational characteristics? Table 4 reports correlations of our measure, *ratio8to5*, with other occupational characteristics reported in the O*NET data base.[8] The table shows that our measure points to the need for coordination with others in the workplace. Our measure is positively cor-

[8]We downloaded from O*NET 24.2 (downloaded in March 2020). O*NET reports scores on the importance of occupational characteristics for detailed 2018 Standard Occupation Code (SOC). We used the Census crosswalk between 2018 SOC codes and 2010 Census Occupation codes and used the 2018 American Community Survey to take weighted averages to more aggregate 2010 Census occupation codes. There were also a number of changes between 2002 and 2010 Census codes. We use the number of full-time workers aged 18-65 in the American Time Use Survey (ATUS) as weights to aggregate O*NET measures to the 2002 Census occupation codes.

related with "establishing and maintaining interpersonal relationships" and "face to face discussions." On the other hand, it is negatively correlated with "assisting and caring for others."

One can view our measure as a rather arbitrary way to think about the concentration of working hours during a day as the peak hours are fixed to be between 8 and 5. As an alternative one could think of how concentrated the hours are during the day without pre-establishing the times of the day. We have also explored an alternative measure of concentration based on the Herfindahl index.

Let $work_j^k$ be the total weighted time spent working in each day of the week-hour time bin $k$ in occupation $j$,

$$work_j^k = \sum_{i=1}^{M_j} work_{ijk}.w_i$$

where $i$ denotes individual in occupation $j$ and $w_i$ denotes the weight of individual $i$.

Let $share_j^k$ be the fraction of the total time spent in each occupation in each time bin and each day.

$$share_j^k = \frac{work_j^k}{\sum_k work_j^k}$$

Our concentration index measure is the Herfindahl index defined as:

$$cr_j = \sum_k (share_j^k)^2$$

Table 4 shows that our coordination measure, $ratio8to5$, and the Concentration Index measure are highly positively correlated, with the correlation equaling 0.743.

The table also reports the correlation of our measure and the measure of "Male Overwork" used by Cortes, Patricia, and Jessica Pan (2016b). "Male Overwork" is defined as the fraction of male workers who report working more than 50 hours per week. This ratio is calculated for men with at least some college education. The correlation between these two measures is 0.129, indicating that while our measure is positively related to the demand for long hours, it is by no means perfectly correlated. Thus, our measure captures another important aspect of hours requirements on the job such as the requirement to be present when others are present.

Table 4: Correlations between Importance of Occupational Characteristics and Ratio8to5

| #Cat. | Name: O*NET Characteristic | Corr. Coeff. |
|---|---|---|
| 1 | Assisting and caring for others | -0.1898* |
| 2 | Coaching and developing others | 0.0476 |
| 3 | Developing_and_Building_Teams | 0.0533 |
| 4 | Establishing_and_Maintaining_Interpersonal_Relationships | 0.2961* |
| 5 | Face-to-Face_Discussions | 0.2349* |
| 7 | Social orientation | 0.0487 |
| 8 | Training_and_Teaching_Others | -0.0714 |
| 10 | Guiding_Directing_and_Motivating_Subordinates | 0.0509 |
| | Concentration Index | 0.7430* |
| | Male Overwork | 0.1290* |
| **#Cat.** | **Name: O*NET Skill Measures** | **Corr. Coeff.** |
| 1 | Social Skills | 0.2146* |
| 2 | Abstract Skills | 0.3638* |
| 3 | Manual Skills | -0.4369* |
| 4 | Routine Skills | -0.3748* |

Notes: The table shows correlations between our standardized Ratio8to5 and O*NET occupational characteristics for 430 detailed Census 2002 occupations. Ratio8to5 is the ratio of total hours worked by all full-time workers during the hours 8 a.m. to 5 p.m. relative to total hours worked in each occupation category in the ATUS time diary data. See Appendix for the detailed definitions of the O*NET characteristics, as well as for details on the variables used and for matching across O*NET Standard Occupation Codes (SOC) and 2002 Census occupation codes. (*) denotes significance at the 5% level.

Another aspect worth exploring is the extent to which our measure of coordination is correlated with other skill requirements at the occupational level, such as social skills (Deming (2017)), and abstract, routine, and manual skills (Acemoglu and Autor (2011)).[9] The bottom rows of Table 4 show that indeed our measure is strongly positively correlated with social skills and abstract cognitive skills while it is negatively correlated with both manual and routine skills. In the next section, we explore the extent to which the returns to our measure of coordination is impacted when we add these skill measures as additional controls.

## 3 The Model

Given the evidence shown in the previous section, we present a general equilibrium model that links three ingredients. First, frictions at the occupational level imply a different productivity for labor supplied at different hours of the day. This leads to a pattern of bunching of hours that varies by occupation. Second, women value household care differently than men. And third, childcare time is not perfectly substitutable during the day. We use the model to motivate the regression specification in Section 5 below that links the gender gap to the $ratio8to5$ calculated in Section 2.

**Environment** The economy is populated by a continuum of male and female workers of equal masses which sum to 1. Everyone lives for one period and values consumption of a market good, denoted by $c$, and a home good denoted by $h$. People rank bundles of the two goods according to a Cobb-Douglas utility function:

[9] For "Social skills" we follow Deming (2017) and use four measures: "Social perceptiveness: being aware of others' reactions and understanding why they react as they do," "Coordination: adjusting action in relation to other's actions," "Negotiation: bringing others together and trying to reconcile differences," and "Persuasion: persuading others to change their minds and behavior." We create a composite score for "Social Skills" by averaging the 4 individual scores. We also construct 4 other composite measures of skill requirements closely following Acemoglu and Autor (2011) and Denning, Jacob, Lefgren, and vom Lehn (2019). See Appendix A.1 for details.

$$u(c,h) = (c)^{\nu^s}(h)^{1-\nu^s}, \tag{1}$$

where $\nu^s$ represents the weight of market goods in utility for gender $s$ with $s = f, m$.

Three aspects of the preferences are worth noting. First, males and females differ in the relative value they give to the home good. This asymmetry should not be taken literally as a fundamental difference in preferences. It is a convenient way to capture observed differences in hours of household care between males and females. This difference may reflect social norms, differences in bargaining power, discrimination, etc., but an explicit modeling of these features is outside the scope of the paper. A second and related aspect is that the decision unit is the individual and not the household. The reason for doing so is data limitations. Specifically, observations in the ATUS are at the individual level, and there is no information on spousal time allocation. Third, as in our empirical part, $h$ represents household care activities that are normally not outsourced (even for full-time workers) and thus we abstract from other household care activities including leisure. In order to isolate the effect of coordinating activities during the day, we want to focus on those activities that are directly performed by the worker.[10]

Workers have one unit of time, a fraction of which can be supplied in a labor market that features $J$ occupations and which are labeled using the integer $j$. Occupations are mutually exclusive; workers can only work in one occupation. Workers receive a wage $w_j$ per unit of time they supply in occupation $j$. Earnings from the supply of labor is how workers finance purchases of the market good $c$.

[10]There is evidence that women also allocate more hours than men to household care activities that we are abstracting from (e.g. preparing meals). To the extent that these activities conflict with work schedules our results provide a lower bound for the mechanism we propose in explaining the gender gap.

Time is divided into two sub-periods of equal length. We label the first period as "prime" (or 1), and the second period as "home" (or 2). We associate the first period in the model with the 8 a.m. to 5 p.m. period in the data.[11] Workers do not exclusively choose how to split their unit of time between working in the market and home care; they also choose how much to allocate to either activity during each sub-period. We denote by $h^i$ and $l^i$, respectively, the home care and work choices in sub-period $t$. Since the total time used must add up to one, the following identity must hold:

$$h^i_{j,1} + l^i_{j,1} + h^i_{j,2} + l^i_{j,2} = 1. \tag{2}$$

Since either sub-period represents half of total time, the following must also be true:

$$h^i_{j,t} + l^i_{j,t} = 0.5, \tag{3}$$

for each sub-period $t$.[12]

Our model abstracts from the labor market participation margin as well as the possibility of working part-time. We recognize that these decisions are not independent from fertility (also not modelled) and that there is a dynamic component to them. Abstracting from these margins does not mean we think they are not relevant to study the gender wage gap. Our goal is to quantify in isolation the new mechanism we propose. We find this mechanism explains a sizeable portion

[11]That our prime period starts at the beginning of the "day", as opposed to the middle (as in the data) is an innocuous assumption. It is convenient and nothing of substance changes if we assume that the prime period starts in the middle of the day. Moreover, the "prime" period in the model need not be equal to half of the total time endowment. The model is flexible and can be adapted to however one defines business hours to be in the data.

[12]To be clear, that we define each subperiod to be equal to 0.5 in length is a normalization. It is akin to defining the total time endowment to be equal to 1.

of the observed gender wage gap but not its totality.

Thus, our focus is on modeling the choice of hours during the day conditional on being a full time worker when caring for children conflicts with the work schedule. The empirical evidence in Section 2 shows that, conditional on being full time workers, the distribution of working hours during the day is not uniform. Workers bunch hours at particular times of the day and the degree of bunching is higher in certain occupations. This evidence, coupled with data from O*NET (see Table 4), suggests that in some occupations the need to coordinate workers' schedules is stronger. For example, some occupations rely more on team production where workers' tasks are complementary, while in others individuals work mostly on their own. This difference in the production technology translates into a friction on an individual's supply of labor. If an individual's tasks are complementary with others' in the same occupation, not supplying labor when others do has a productivity penalty. For example, missing a team project meeting has a productivity penalty. This penalty is likely to differ across occupations. Returning to our model, while we do not explicitly model the production technologies that lead to coordination needs, we assume that not supplying labor during prime time has a penalty. More specifically, a reduced form way of capturing the importance of coordinating workers' schedules is given by a reduction in the effective hours of work when labor is not supplied during prime time:

$$l_j^i = l_{j,1}^i + l_{j,2}^i - (0.5 - l_{j,1}^i)^{\alpha_j} \quad \textit{with} \quad \alpha_j \geq 0 \quad \text{for} \quad j = 1, ..., J. \tag{4}$$

The parameter $\alpha_j$ drives the penalty for not supplying labor during prime time in occupation $j$. The penalty is infinitely large when $\alpha_j$ is zero: any missed hours during the prime time yield zero effective labor. The penalty vanishes as $\alpha_j$ tends to infinity, as the effective labor is the sum of $l^i_{j,1}$ and $l^i_{j,2}$, irrespective of the value of $l^i_{j,1}$.[13]

This specification allows for large productivity losses in some occupations when a worker postpones working time to the second period ("home"). The penalty is large in occupations with a low $\alpha_j$, while in those with a high $\alpha_j$ the loss is minimal. The maximum amount of time any worker (male of female) can work in the prime period is 0.5. For a given amount of work, supplying more home care time during period 1 leads to a lower productivity per hour. The extent of the productivity loss is occupation- but not gender-specific. Although $\alpha$ is exogenous, and thus our model is silent about the source of these differences, one interpretation is that workers coordinate because productivity rises when everyone is present. By convention, this coordination takes place during the period we call prime time.

The production of home goods employs hours both within prime and home time according to a Constant Elasticity of Substitution (CES) technology:

$$h^i = \left[ (h^i_1)^\rho + (h^i_2)^\rho \right]^{\frac{1}{\rho}}, \tag{5}$$

where $\rho$ is the parameter that governs the elasticity of substitution between the supply of home care time across the two time periods. If $\rho$ <1, home care in different periods are imperfect substitutes.

On the production side, there is a set of $J$ intermediate goods producers indexed by $j$. We associate the production of an intermediate good with an occupation. Each produces an amount $X_j$ of the intermediate good. Production employs a linear technology in effective units of labor $N_j$; that is, $X_j = A_j N_j$, where $A_j$ is a

[13]While from a technological perspective $\alpha_j = 0$ is possible, an occupation with such an extreme need for coordination cannot exist in equilibrium. Wages would need to be infinity for workers to choose it.

total factor productivity parameter.[14] Markets are competitive and the producer faces prices for her good $p_j$ and wages $w_j$.

The producer of intermediate good $j$ solves the following maximization problem:

$$\max_{N_j} p_j X_j - N_j w_j \tag{6}$$

subject to the available technology $X_j = A_j N_j$. The solution to the problem is $p_j = w_j / A_j$. Intermediate goods producers sell to a final goods producer. The technology for producing a certain amount $Y$ of the final good from a vector of quantities of intermediate services $\{X_1, \ldots, X_J\}$ is described by,

$$Y = \sum_{j=1}^{J} \left\{ \kappa_j X_j^{\beta} \right\}^{\frac{1}{\beta}}. \tag{7}$$

where $\beta$ governs the elasticity of substitution between the intermediate goods and $\kappa_j$ the share of each one in final production.

The final good producer solves the following maximization problem:

$$\max_{\{X_1,\ldots,X_J\}} \sum_{j=1}^{J} \left\{ \kappa_j X_j^{\beta} \right\}^{\frac{1}{\beta}} - \sum_{j=1}^{J} p_j X_j. \tag{8}$$

Note that in equilibrium $X_j = A_j N_j$ and $p_j = w_j / A_j$, so that this maximization problem implicitly defines labor demand functions $\left\{ N_j = N_j^d (w_j, N_{-j}) \right\}_{j=1}^{J}$

**Individual's Decision Problem** Prior to choosing an occupation, each individual draws a vector of taste parameters for occupations, $\Omega_i$, from gender-specific

[14]The role of the total factor productivity parameters is only to help deliver the empirical distribution of earnings across occupations. Replicating that distribution is necessary to obtain a plausible between-occupations gender wage gap.

distributions $F(\theta_{j,s})$. Thus, each individual $i$ is represented by the vector

$$\Omega_i = \left\{\theta_{i,1}, \ldots, \theta_{i,J}\right\}$$

.Each element of the vector, $\theta_{i,j}$, represents the taste for occupation $j$ and are independent across occupations. These shocks are important in matching the empirical sorting of workers into occupations. These shocks represent the various forces we leave out but which nonetheless determine the size and gender composition of occupations (comparative advantages, experience, etc.).

The amount of effective labor supplied by a worker of gender $s$ in occupation $j$ is $l_j^s$. Effective labor is compensated at a rate $w_j$ per unit.

The value of occupation $j$ for an individual of gender $s$ is:

$$V_j^s(\theta_j^s) = \theta_j^s \left\{ \max_{c^s, l_{j,1}^s, l_{j,2}^s, h_{j,1}^s, h_{j,2}^s} \{u(c^s, h^s)\} \right\} \tag{9}$$

$$s.t. \tag{10}$$

$$c^s = l_j^s w_j \tag{11}$$

$$h_{j,2}^s + l_{j,2}^s = 0.5 \tag{12}$$

$$h_{j,1}^s + l_{j,1}^s + h_{j,2}^s + l_{j,2}^s = 1 \tag{13}$$

$$l_j^s = l_{j,1}^s + l_{j,2}^s - (0.5 - l_{j,1}^s)^{\alpha_j} \quad with \quad \alpha_j \geq 0 \tag{14}$$

$$h_j^s = \left[(h_{j,1}^s)^\rho + (h_{j,2}^s)^\rho\right]^{\frac{1}{\rho}} \tag{15}$$

Each individual chooses from the set of $J$ occupations the one that yields the highest utility.

$$\widehat{j}^s = argmax\left\{V_1^s, \ldots, V_J^s\right\} \tag{16}$$

where $V^s_{\widehat{j}}$ denotes an worker's value function in her chosen occupation $\widehat{j}$.[15] The occupational choice determines an endogenous distribution of male and female workers across occupations. Let $\mu_j^s$ denote the mass of gender $s$ workers in occupation $j$, then $\sum_{j=1}^{J}(\mu_j^f + \mu_j^m) = 1$. Define $\mu_j = \mu_j^f + \mu_j^m$ as the size of occupation $j$.

**Aggregation and Equilibrium** Given wages, individuals solve the optimization problem yielding value functions $\left\{V_j^s\right\}_{j=1}^{J}$.

For an occupation $j$, its population satisfies $\mu_j^s = Prob(V_j^s > V_{-j}^s)$ where we define the vector $V_{-j}^s$ to be equal to $\left\{V_1^s, \ldots, V_{j-1}^s, V_{j+1}^s, \ldots, V_J^s\right\}$.

For occupation $j$, the total labor input is defined as,

$$N_j = \frac{\mu_j^m}{\mu_j}(l_{j,1}^m + l_{j,2}^m - (0.5 - l_{j,1}^m)^{\alpha_j}) + \frac{\mu_j^f}{\mu_j}(l_{j,1}^f + l_{j,2}^f - (0.5 - l_{j,1}^f)^{\alpha_j}). \tag{17}$$

In addition, in equilibrium:

$$w_j = \kappa_j A_j^{\beta} N_j^{\beta-1} \sum_{j=1}^{J} \left[\kappa_j X_j^{\beta}\right]^{\frac{1}{\beta}-1}. \tag{18}$$

Given individual's occupational and hours choices our model predicts $ratio8to5$'s for working hours for each occupation which we denote as $ratio8to5_j$. Following the definition of these indicators presented above, its model counterpart is given by:

[15]To save on notation we write $V_j^s$ for the value of working in occupation $j$. It is understood that this value depends on a taste parameter $\theta_j$.

$$ratio8to5_j = \frac{\mu_j^m}{\mu_j} \frac{l_{j,1}^m}{(l_{j,1}^m + l_{j,2}^m)} + \frac{\mu_j^f}{\mu_j} \frac{l_{j,1}^f}{(l_{j,1}^f + l_{j,2}^f)}. \tag{19}$$

where $\mu_j$ is the fraction of workers in occupation $j$, and $\mu_j^m$ and $\mu_j^f$ are the fraction of males and females in occupation $j$, respectively.

Before we take this model to the data and examine the role of coordination frictions in accounting for the gender gap, we illustrate the model's mechanisms using a simpler version than the one described above.

# 4 Model Mechanics in a Simple Case

We restrict attention to an economy with only two occupations. We provide a numerical example choosing illustrative values of the parameters to uncover the main mechanisms. We analyze three environments which differ in the degree of heterogeneity among workers, detailed below. There is a set of parameters that are common across these economies. We assume a Cobb-Douglas technology for the final good and earnings in each occupation represent an equal share in final aggregate income, i.e $\kappa_1 = \kappa_2 = 0.5$. The parameters that govern the productivity penalty due to the coordination of workers are $\alpha_1 = 0.8$ and $\alpha_2 = 2.8$. In other words, in occupation 1 coordination is much more important. Table 5 summarizes the results of each of the experiments that are described below.

**Economy 1: Homogeneous Agents without Gender Differences** This economy features a mass of size 1 of workers who have the same weight for market consumption: $\nu_m = \nu_f = 0.8$. The parameter driving the elasticity of substitution between home care time at the two time periods of the day (between $h_1$ and $h_2$), $\rho$, is set to 0.6. The results are shown in Panel A of Table 5.

Consumption goods and household care are substitutes. More market consumption implies more market time and less time allocated to household care. The equilibrium features sorting into occupations, with a larger mass of workers choosing occupation 2. Because of the higher $\alpha$, productivity losses due to coordination are smaller in occupation 2. As a result, occupation 2 is more attractive. Despite the higher cost, the final goods technology rules out an equilibrium in which no one chooses occupation 1. Wages adjust to leave workers indifferent between the two occupations. The higher wage results in a higher supply of labor in occupation 1. Hence, $l_1 + l_2$ is larger. However, they have to pay a higher penalty and as a result effective hours are equal across occupations. To summarize, workers in occupation 1 supply more market work and less household care. The opposite is true in occupation 2. Why is the $ratio8to5$ higher in occupation 1? Because workers, in an attempt to minimize the hours penalty, bunch hours to a larger extent in the prime period. Prime time cannot be exclusively devoted to work, however, because home care cannot be substituted perfectly across the two sub-periods. Finally, since workers in occupation 1 devote relatively more hours to work in prime time they end up devoting relatively more hours of household care during home time ($h_2$)

**Economy 2: Gender Differences in Household Care Responsibilities** We now consider the case of an economy where males and females are differentiated by the weight in market consumption $\nu$. Half of the workers have $\nu = 0.9$ (male) and half have $\nu = 0.7$ (female), i.e. females have stronger preferences for household care. The results are shown in Panel B of Table 5.

Due to their different preferences, females and males do not sort randomly into the two occupations. Females have a relatively higher preference for household care and thus they populate only occupation 2, the high $\alpha$ occupation. Occupation 2 allows females to supply household care without paying too high an hours penalty. In addition, since household care hours are complementary during the day, more total household care time means a higher supply of household care hours both within prime and home time, i.e. household care hours need to be smoothed during the day. Occupation 2 allows them to do that at a relatively lower cost. Males have a comparative advantage in occupation 1. Because they want to supply more labor, they downplay the importance of the penalty when choosing their occupation. As a result, a higher proportion of males work in occupation 1.

To summarize, workers in occupation 2 spend a bit more time in home care (because the wage is lower). Consequently, raw hours, effective hours worked, and earnings, are all lower. Therefore, in equilibrium there is a gender gap in earnings per hour of 3 percent.[16] All females are in occupation 2 representing 89 percent of all workers in that occupation. Because their time allocation is different, males and females earn different amounts per hour with an wage gap of 0.5 percent. Thus, in this example most of the gender wage gap is due to earnings per hour differentials between occupations (as opposed to within occupations).

**Economy 3: Gender Differences in Household Care Responsibilities and Tastes for Occupations** We now consider the case of economy 2, but we incorporate gender differences in tastes for each occupation which results in 50 percent of workers being female in each occupation. The results are shown in Panel C of Table 5.[17]

Conditional in working on occupation 1, females want to work more than if

[16] Throughout the paper the terms gender gap in earnings per hour and gender wage gap are used interchangeably.

[17] In the Appendix, we report similar experiments with a model of two-earner households. In the paper we work with single-agent models because we lack data on time allocation for both spouses.

they are in occupation 2 since they want to minimize the coordination cost. However, they will work less than males since they want to supply relatively more time to household care. As a result they will end up paying a higher cost in terms of effective hours and thus their earnings per hour are going to be lower than males. This is also the case for males and females in occupation 2, but the effects are lower given that $\alpha$ is higher. For this reason, the gender earnings gap per hour is higher in occupation 1. In equilibrium, this example features a gender gap in earnings per hour of 5 percent in occupation 1 and no gender earnings gap in occupation 2. The aggregate gender earnings gap for this economy is also 3 percent. While the aggregate earnings gap is the same as in economy 2, the gender gap in this economy is entirely driven by earnings differences within occupations due to the fact that women have fewer effective hours.[18]

As in the other economies, conditional on being in occupation 1, workers want to supply more time in prime time to minimize the coordination cost, and as in the other cases, the ratio is higher in occupation 1. Therefore, the example reflects the negative correlation between the $ratio8to5$ and the gender earnings gap we find in the empirical part of the paper.

[18] Note that in this particular example the share of workers in each occupation is 50 percent so all the differences in earnings per hour come from differences in effective hours and not from differences in the wage rates across occupations.

Table 5: A Simple Case with Gender Differences

| Occupation | % Workers | Bunching Ratio | Earnings | $l_1 + l_2$ | $l$ | % Females | E. Gap |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Panel A: No Gender Differences | | | | | | | |
| 1 | 0.48 | 0.59 | 0.42 | 0.82 | 0.80 | | |
| 2 | 0.52 | 0.51 | 0.38 | 0.80 | 0.80 | | |
| Panel B: Gender-Specific $\nu$ | | | | | | | |
| 1 | 0.44 | 0.55 | 0.46 | 0.91 | 0.90 | 0 | |
| 2 | 0.56 | 0.52 | 0.35 | 0.73 | 0.73 | 89 | 1.005 |
| Gender Earnings Gap | 1.031 | | | | | | |
| Panel C: Gender-Specific $\nu$ and Tastes | | | | | | | |
| 1 | 0.50 | 0.60 | 0.40 | 0.81 | 0.79 | 50 | 1.047 |
| 2 | 0.50 | 0.51 | 0.40 | 0.81 | 0.80 | 50 | 1.005 |
| Gender Earnings Gap | 1.026 | | | | | | |

Note: This table shows the results of the numerical exercises described in Section 4. Panel A refers to the case with no gender differences, i.e. homogeneous agents. Panel B is the case with gender differences in the preferences for household care, governed by parameter $\nu$. Panel C describes the same case of Panel B but we add gender specific taste shocks. Column (1) refers to the different occupations considered, 1 and 2. Column (2) describes the share of total workers in each occupation. Column (3) is the 8to5ratio as defined in Section 3. Column (4) contains the total earnings in equilibrium in each occupation. Column (5) contains the total number of working hours in each occupation. Column (6) presents the total number of effective hours, Column (7) the share of females in each occupation, and Column (8) the gender gap in earnings per hour in each occupation. Finally, in Panel B, and C, the table reports the ratio of earnings per hour of males over females for the whole economy, denoted as the gender earnings gap.

# 5 Coordinated Work Schedules and the Gender Wage Gap

The model analyzed in the previous section links earnings to $ratio8to5$ through worker sorting and general equilibrium effects. Since frictions at the occupational level affect genders differently, we are interested in examining how earnings by gender interact with bunching-ratios (a proxy for frictions at the occupation level).

The two main conclusions from the model experiments are: (a) Occupations with higher *ratio8to5* pay more and (b) the gender gap is larger in occupations with a higher *ratio8to5*. To see whether the model's implications hold in the data, in this section we analyze how our measure of coordinated work schedules (the *ratio8to5*) is priced in the labor market, and how it impacts the gender wage gap. Specifically, we estimate the following regression at the individual level:

$$lnW_i = \beta_0 + \beta_1 * female_i + \beta_2\, ratio8to5_j + \beta_3\, female_i * ratio8to5_j + \beta_4\, X_i + \varepsilon_i \tag{20}$$

where $lnW_i$ is the log of individual weekly earnings, $female_i$ is the female dummy, $ratio8to5_j$ is the ratio of hours worked in the 8 to 5 interval which varies at the occupation level $j$, $X_i$ are other observable characteristics including a dummies for race and education and a quartic function in age. We also control for (log) hours worked last week so that the coefficients we report reflect gaps in the hourly wage.[19] Our sample includes only full-time workers. $\beta_1$ measures the impact of the female dummy, $\beta_2$ measures the impact of working in occupations with a more concentrated work day, and $\beta_3$ captures how being female interacts with working in these occupations.

Table 6 reports the results of the regression. The top panel reports the results for all full-time workers. Column (1) presents the baseline results. Women earn on average 22 percent less than men. Individuals in occupations with higher *ratio8to5* earn higher wages, with a one standard deviation higher ratio leading to approximately 11 percent higher wages. The interaction term indicates that women suffer

[19] Specification with constructed log hourly wages where we divide weekly earnings by usual weekly hours yielded very similar results.

about a 5 percent higher penalty in these occupations. In column (2) we control for occupation-level education which reduces the size of the wage premium associated with these occupations and also the female-specific penalty. In column (3) we control for the fraction of male workers in the occupation who report working more than 50 hours per week– the measure of "overwork" used by Cortes, Patricia, and Jessica Pan (2016b). In colum (4) we include O*NET skill measures such as social, abstract, manual, and routine skills. The coefficient on the concentration measure is still significant although the addition of skill measures reduces the female-specific penalty somewhat.

The bottom two panels report results separately by marital and parental status. Panel B reports results for single men and women. Notably the interaction terms are all insignificant pointing to the fact that there is no penalty for women associated with coordinated work schedules. Panel C reports results for married men and women with children. The female interaction terms are larger and significant which suggests that the results pooling over all workers reported in the top panel were largely due to the married with children group. Notably even when we include "overwork" and O*NET skill measures as additional controls, the coefficient on the interaction term is -4 percent and still significant at the 5 percent level.

These regressions indicate that workers in occupations where most adhere to a standard 8 to 5 schedule are paid a higher wage. However, the gender gap in these occupations is larger. This pattern is particularly pronounced when we restrict our sample to married men and women with children, strongly suggesting that conflicts related to work and family time play an important role.

One objection to our interpretation of the results is that employers may be practicing statistical discrimination against married women with children and the level

Table 6: Gender Gap in Log Weekly Earnings by Coordination Measure Ratio8to5

| | (1) baseline | (2) (1)+agg. education | (3) (2)+ overwork | (4) (3)+ ONET |
|---|---|---|---|---|
| Panel A: All | | | | |
| female | -0.218*** | -0.254*** | -0.244*** | -0.213*** |
| | (0.0194) | (0.0129) | (0.0129) | (0.0118) |
| ratio8to5 | 0.113*** | 0.0644*** | 0.0631*** | 0.0691*** |
| | (0.0170) | (0.0136) | (0.0138) | (0.0132) |
| femaleXratio8to5 | -0.0490* | -0.0457** | -0.0436** | -0.0279* |
| | (0.0264) | (0.0180) | (0.0190) | (0.0154) |
| Observations | 263245 | 263245 | 263179 | 256738 |
| Panel B: Single Without Children | | | | |
| female | -0.135*** | -0.169*** | -0.165*** | -0.132*** |
| | (0.0157) | (0.0117) | (0.0118) | (0.0113) |
| ratio8to5 | 0.102*** | 0.0623*** | 0.0613*** | 0.0617*** |
| | (0.0146) | (0.0132) | (0.0131) | (0.0105) |
| femaleXratio8to5 | -0.0216 | -0.0254 | -0.0242 | -0.0094 |
| | (0.0207) | (0.0162) | (0.0168) | (0.0141) |
| Observations | 73536 | 73536 | 73516 | 71602 |
| Panel C: Married With Children | | | | |
| female | -0.263*** | -0.298*** | -0.286*** | -0.256*** |
| | (0.0229) | (0.0159) | (0.0162) | (0.0136) |
| ratio8to5 | 0.109*** | 0.0652*** | 0.0649*** | 0.0722*** |
| | (0.0189) | (0.0142) | (0.0151) | (0.0149) |
| femaleXratio8to5 | -0.0626* | -0.0595** | -0.0582** | -0.0401** |
| | (0.0327) | (0.0221) | (0.0236) | (0.0191) |
| Observations | 110230 | 110230 | 110206 | 107642 |

Notes: Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .001$. Standard errors are clustered at the occupation. See main text for an explanation of control variables.

of discrimination is particularly severe in occupations with coordinated schedules. This alternative interpretation, while closely related, suggests that it is not necessarily the temporal constraints that women face due to household care responsibilities that are at play. To further investigate this alternative explanation, we examine different groups of married men (with children) who are full-time workers, differentiated by the work status of their wives.[20]

[20] Appendix Table A.5 and Table A.6 examine work hours and household care of married fathers by work status of the spouse. The tables show that fathers with full-time working spouses work 0.25 fewer hours on a weekday and perform somewhere between 0.07 to 0.12 more hours of household care on a typical weekday relative to fathers with non-working spouses.

In Table 7 we investigate whether these constraints imposed by care responsibilities translate into wage penalties. Table 7 reports the results of a regression in a similar format as Table 6 but we now make comparisons among men only. The sample includes all married men with children matched to a spouse in the CPS data. The variables "Spouse PT" and "Spouse FT" are indicators equal to 1 if the wife works part-time or the wife works full-time respectively. The omitted category is "Wife Not Working." The coefficients indicate that married men with full-time working wives earn approximately 5 percent less than married men with non-working wives indicating either selection or specialization effects.[21]

The coefficients of interest however are the interaction terms which indicate that a one standard deviation higher ratio leads to a 3-4 percent higher penalty for men with part-time working wives, and a 5-6 percent penalty for men with full-time working wives. Table 7 shows that the phenomenon is not unique to comparisons between men and women but is more general and applies where there is balancing between work and household care. It's possible that the direction of causality is the opposite– that spouses with less earning power engage in more household care. Regardless, our argument is that there is a systematic wage penalty associated with doing household care related to our coordination measure. While we focus on the gender wage gap in our paper, the important message here is that the work-family conflict we identify is more widely applicable to all parents with care responsibilities.

In the appendix, we conduct various robustness exercises in support of our main results. One concern with our measure is whether it is confounded with the prevalence of evening and night shifts. Nurses, for example, work shifts and are

[21]In the regressions shown in Table 7 we control for log weekly hours on the main job to focus on the hourly wage gap. Regression results using constructed hourly wages (weekly earnings divided by usual weekly hours) yield very similar results.

at work during all hours of the day and the occupation would have low coordination requirements according to our measure. However, this may just be reflecting a 24-hour production cycle. To address this issue, in Table A.8 we add the fraction of workers who report to be shift workers based on the 2004 Work Schedule Supplement as an additional control. Our results are robust to these additional controls. Table A.9 in the appendix also reports regression results using our alternative measure of concentrated hours based on the Herfindahl Index. These results are qualitatively very similar. An additional confirmation of our point is in Cubas, Juhn, and Silos (2021), in which we estimate the wage penalty for women using an alternative measure of the interruptions of household care activities during prime hours of the workday.[22]

# 6 Quantitative Analysis

To assess the quantitative predictions of the model, we calibrate the model using aggregates from the US labor market. We restrict the analysis to 22 major SOC occupations (not including the military).[23] We also restrict the sample to married men and women with children in the household. Among other variables of interest, solving the model yields $ratio8to5$ for work and home care, as well as earnings for men and women in each occupation.

[22]While our analysis is static and relies on cross-sectional data, in appendix A.3 we study earnings dynamics of females around childbirth. Specifically, we estimtate the effect on earnings per hour of having a child and show that in occupations with a high $ratio8to5$ the drop in earnings per hour after childbirth is more persistent.

[23]We use the number of full-time workers aged 18-65 married with children in the American Time Use Survey (ATUS) as weights to aggregate our detailed Census 2002 occupation level measures to 2002 major SOC categories.

Table 7: Log Weekly Earnings of Males by Working Status of Spouse and Coordination Measure Ratio8to5 – Married with Children

| | (1) baseline | (2) (1)+agg. education | (3) (2)+ overwork | (4) (3)+ ONET |
|---|---|---|---|---|
| ratio8to5 | 0.146*** | 0.108*** | 0.109*** | 0.104*** |
| | (0.0233) | (0.0185) | (0.0189) | (0.0172) |
| Spouse PT | 0.0128 | 0.0065 | 0.0068 | 0.0045 |
| | (0.0086) | (0.0082) | (0.0082) | (0.0082) |
| Spouse FT | -0.0465*** | -0.0521*** | -0.0509*** | -0.0500*** |
| | (0.0088) | (0.0088) | (0.0083) | (0.0082) |
| Spouse PT X ratio8to5 | -0.0296** | -0.0356** | -0.0357** | -0.0259** |
| | (0.0117) | (0.0110) | (0.0111) | (0.0110) |
| Spouse FT X ratio8to5 | -0.0550*** | -0.0561*** | -0.0572*** | -0.0476*** |
| | (0.0113) | (0.0113) | (0.0112) | (0.0110) |
| Observations | 68281 | 68281 | 68267 | 66655 |

Note: Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .001$. Standard errors are clustered at the occupation level. Column (2) includes the average education level in the occupation as an additional control. Additional controls include a quartic in age, dummies for different levels of educational attainment, race dummies, and year dummies. Column (3) also includes the share of male workers with at least some college education in the occupation who work more than 50 hours per week. Column (4) also includes occupation-level skill measures such as "social skills," "abstract skills," "routine skills," and "manual skills" constructed from the O*NET

## 6.1 Calibration

We assume that the distribution of tastes is Frechet with a common dispersion parameter.[24] Thus, we assume that for an occupation $j$ and a gender $s$ taste shocks are drawn from,[25]

$$F(\theta_{j,s}) = Prob(\theta_{j,s} \leq \theta_0) = exp(-T_{j,s}\theta_0^{-\xi}) \tag{21}$$

The calibration chooses values for a total of 114 parameters:

$$\left(\{\alpha_j\}_{j=1}^{22}, \{\kappa_j\}_{j=1}^{22}, \{T_{j,m}\}_{j=1}^{22}, \{T_{j,f}\}_{j=1}^{22}, \{A_j\}_{j=1}^{22}, \rho, \nu^f, \nu^m, \beta\right).$$

[24]This assumption is typical in discrete choice models and made for tractability.

[25]Because the paper is not concerned with the distribution of tastes within occupations, setting a common dispersion parameter is irrelevant. We could assume either a different common dispersion parameter or a different dispersion parameter by occupation and gender. Doing so would yield different values for the (female) Frechet parameters driving the mean for the model to be consistent with the empirical female shares across occupations.

We follow Hsieh, Hurst, Jones, and Klenow (2019) and set the value of $\beta$ to 2/3 which implies an elasticity of substitution across occupations equal to 3. Because the dimension of the parameter vector is large, we set the vector $\{\kappa_1, ..., \kappa_{22}\}$ equal to the vector of observed labor shares: the vector of the share of earnings of occupation $j$ in total earnings.[26] Of course, with a CES production function the model-implied labor shares differ from those in the data (because with a CES the value of $\kappa_j$ is not equal to the labor share of occupation $j$). We provide a comparison of the model-implied and empirical labor shares below and show that the differences are not too large. The remaining parameter values are chosen to minimize the distance between the moments in the data and the ones generated by the model. The moments we pick to match are the following: the bunching ratios, $ratio8to5$, the fraction of females relative to males within an occupation, the fraction of employment in each occupation, the average earnings per hour for each occupation, the fraction of working time for males and females, and the ratio of the average $ratio8to5$ (work bunching ratio) to the average bunching ratio of home care.[27] The value of the last moment is largely influenced by $\rho$. A high value of $\rho$ implies a low home care ratio (little home care takes place during prime time).[28]

Table 8 shows the values for the occupation-specific moments we match. Table 9 illustrates the model fit by showing the correlation between the targeted moments in the data and in the model as well as the mean absolute deviation in percentage terms between the moments in the data and in the model. The model fit is quite good. In addition, the table also shows the value of the $ratio8to5$ by gender, both in the data and the model. Empirically, women on average have a higher $ratio8to5$

[26]Calibrating the remaining 91 parameters is in itself a challenging computational problem.

[27]The bunching ratio for home care is defined similarly to the $ratio8to5$, but counting the fraction of home care time between the prime working hours.

[28]Because we only model two activities and we normalize the length of each period to be 0.5, the model can't deliver either work or home care bunching ratios in levels. Therefore we target the ratio.

than men. The model delivers this result and the intuition is that because women work fewer hours overall, they try to increase, relatively, the amount supplied during 8 to 5 in high coordination occupations. The parameter values we obtain are shown in Table 10. The most interesting set of parameters are the $\alpha$'s. Their distribution is rather skewed and their correlation with the $ratio8to5$ is -0.5. In other words, the $ratio8to5$ across occupations is mainly determined by the $\alpha$ but not completely (otherwise the two would be perfectly negatively correlated). The share of females in an occupation also plays an important role. The $ratio8to5$ of females is higher than that of males, so if an occupation is 90 percent female (as is, for example, Healthcare Support) it must have a larger $\alpha$ than an occupation with the same $ratio8to5$ but say only 30 percent females. The skewness is an artifact of coordination costs being virtually zero for a large $\alpha$.[29] It is also worth noting that we estimate a relatively low value of $\rho$ (0.48) which implies that time allocations to household care in different periods are less than perfect substitutes for each other.

As a way to validate the model, in Table 11 we re-run the regressions reported in Section 5 but we now estimate the them for 22 occupations using individual data and model-generated data. The first column displays the coefficients on the female dummy, the $ratio8to5$, and the interaction between the two using data.[30] The second column shows the analogous coefficients from our model-simulated data. Note that the regression coefficients were not a targeted moment in the calibration. The $ratio8to5$ coefficient is 0.29 in the model and it is larger than that in the data because there are fewer elements affecting earnings per hour in the

[29]There is little information about coordination costs for an $\alpha$ that exceeds 50 as in the case of "Protective Services", it basically has the same effect of an $\alpha$ that is larger than 5. This is a special occupation and it could be that our moment-matching function is not correctly identifying the value of $\alpha$ for it.

[30]Note that the coefficients will not exactly match those in Table 6 due to the fact that our occupation measure is aggregated to 22 groups.

Table 8: Moments

| Occupation no. | Occupation | Labor Share | *8to5ratio* | Av. Earn. Per Hour | % Fem. |
|---|---|---|---|---|---|
| 1 | Management | 0.185 | 0.807 | 1.00 | 0.31 |
| 2 | Business and financial operations | 0.062 | 0.856 | 0.90 | 0.52 |
| 3 | Computer and mathematical | 0.053 | 0.837 | 1.08 | 0.22 |
| 4 | Architecture and engineering | 0.042 | 0.825 | 1.03 | 0.08 |
| 5 | Life, physical, and social science | 0.014 | 0.830 | 0.96 | 0.34 |
| 6 | Community and social service occupations | 0.016 | 0.778 | 0.67 | 0.54 |
| 7 | Legal | 0.021 | 0.863 | 1.09 | 0.46 |
| 8 | Education, training, and library | 0.069 | 0.834 | 0.72 | 0.72 |
| 9 | Arts, design, entertainment, sports, and media | 0.014 | 0.817 | 0.82 | 0.33 |
| 10 | Healthcare practitioners and technical | 0.068 | 0.723 | 0.88 | 0.70 |
| 11 | Healthcare support | 0.009 | 0.710 | 0.42 | 0.87 |
| 12 | Protective service | 0.030 | 0.592 | 0.73 | 0.12 |
| 13 | Food preparation and serving related | 0.012 | 0.604 | 0.37 | 0.46 |
| 14 | Building and grounds cleaning and maintenance | 0.017 | 0.715 | 0.40 | 0.31 |
| 15 | Personal care and service | 0.008 | 0.667 | 0.42 | 0.73 |
| 16 | Sales and related | 0.091 | 0.788 | 0.72 | 0.34 |
| 17 | Office and administrative support | 0.085 | 0.826 | 0.54 | 0.72 |
| 18 | Farming, fishing, and forestry | 0.004 | 0.627 | 0.33 | 0.24 |
| 19 | Construction and extraction | 0.055 | 0.791 | 0.62 | 0.01 |
| 20 | Installation, maintenance, and repair | 0.042 | 0.764 | 0.65 | 0.03 |
| 21 | Production | 0.057 | 0.648 | 0.52 | 0.23 |
| 22 | Transportation and material moving | 0.045 | 0.659 | 0.51 | 0.11 |

Note: The table presents the occupational level moments we use in our calibration. Labor shares are calculated by dividing the total earnings of workers in each occupation by the total mass of earnings in the sample. The *8to5ratio* is our measure of coordination using time use data obtained as we explain in the text. We also report the average earnings per hour of workers in each of the occupations (*Av.Earn.PerHour*) and the share of females in the total number of workers in each occupation (*%Fem.*).

model.[31] The coefficient on the interaction between the *ratio8to5* and the female dummy is -0.04. What drives the positive relationship between the gender gap and the *ratio8to5* in the model? The coordination cost is higher the lower the $\alpha$, which translates into a higher *ratio8to5*. Since females supply more home care, and home care is not perfectly substitutable across hours of the day, they supply fewer market hours during the prime period. As a result, their effective hours drop and their compensation reflects the lost hours.

As a way to further validate the model, we examine its performance on other non-targeted moments. For example the model implies that high-$\alpha$ occupations

[31]The values of the coefficient differ because of the heterogeneity over many dimensions (age, education, etc.) across individuals within occupations, whereas in the model the heterogeneity is only between males and females.

Table 9: Model Fit

Panel A: Occupational-level Moments

| Moment | Correlation Coeff. Model-Data |
|---|---|
| $8to5ratio$ | 1.00 |
| Average Earnings Per Hour | 1.00 |
| % Females | 0.98 |
| Occupational Shares | 0.98 |

Panel B: Economy-wide Moments

| Moment | Data | Model |
|---|---|---|
| Ratio Hours Worked Male-Female | 1.2 | 1.23 |
| $ratio8to5$ Work/$ratio8to5$ Household Care | 2.03 | 2.22 |

Panel C: Overall Measure of Fit

| | |
|---|---|
| Average Absolute % Deviation (Model-Data) | 5.3% |

Panel D: Non-Targeted Moments

| Moment | Data | Model |
|---|---|---|
| $ratio8to5$ Males | 0.74 | 0.62 |
| $ratio8to5$ Females | 0.82 | 0.70 |

Note: The table shows the model fit by comparing the value of the targeted moments in the data and in the model. In addition, Panel D shows the values of non-targeted moments. For the occupational-level moments we show their values in the data and in the model (Panel A). For the economy-wide targeted moments we show in Panel B, for each targeted moment, the correlation across occupations between the value of the moments in the data and in the model. The last line of the table gives an overall measure of fit (average absolute percentage deviation between model and data).

(lower coordination costs), the ratio of males to females labor supply is lower. The reason is that females supply more labor in low $\alpha$ occupations because it is costly not doing so. The data seems to be in line with this model's prediction. The correlation of the ratio of males to females labor supply across occupations between data and model is 0.26. In the model, females' $ratio8to5$ are higher than males' $ratio8to5$. The reason is that it's costly to supply labor outside of the prime time, so females proportionally supply more labor during that period. This decreases their $ratio8to5$. The relative ratio of males' $ratio8to5$ to females' work bunching ratio is 0.89 in the model, while it's 0.90 in the data.

## 6.2 The Baseline Economy

Solving the model for the set of calibrated parameter values delivers an equilibrium that features an allocation of males and females over occupations and a vector of occupation-specific wage rates compensating a unit of labor. The equilibrium also generates a gender wage gap in each occupation and an economy-wide gender wage gap. The economy-wide gender wage gap can be decomposed into a between- and a within- occupation components. More specifically, let the earnings ratio between males and females for the whole economy be defined as $egap = \frac{e_m}{e_f}$, where $e_m$ and $e_f$ represent the mean earnings of males and females across occupations, respectively. That is,

$$egap = \frac{e_m}{e_f} = \frac{\sum_{j=1}^{J} \gamma_{m,j} e_{m,j}}{\sum_{j=1}^{J} \gamma_{f,j} e_{f,j}}, \tag{22}$$

where $\gamma_{m,j}$ and $\gamma_{f,j}$ are the proportions of males and females in occupation $j$ over total males and females in the population.

Thus,

$$egap = \frac{\sum_{j=1}^{J} \gamma_{m,j} e_{f,j}}{\sum_{j=1}^{J} \gamma_{f,j} e_{f,j}} \frac{\sum_{j=1}^{J} \gamma_{m,j} e_{m,j}}{\sum_{j=1}^{J} \gamma_{m,j} e_{f,j}}. \tag{23}$$

The first term of the right hand side of the equation represents the *between* component whereas the second represents the *within* component. In the tables we report each component as a log-ratio. [32]

Table 12 reports the results. The first row contains the decomposition in the data. The overall gender wage gap is 23.2 percent. The within component is 24.1 percent while the between component is -0.9 percent. This is broadly consistent with Goldin (2014) who finds that the bulk of the gender wage gap exists within

[32] There is not a unique way to perform this decomposition. For example you could fix the share of males in the occupations instead of females. The magnitudes can slightly change but the results are qualitatively the same.

occupations and only a small component is due to the between portion.

Table 10: Parameter Values

Panel A: Occupational-specific Parameters

| Occupation no. | Occupation | $\kappa$ | $\alpha$ | $A$ | $T_f$ | $T_m$ |
|---|---|---|---|---|---|---|
| 1 | Management | 0.185 | 0.98 | 0.89 | 8.05 | 1.78 |
| 2 | Business and financial operations | 0.062 | 0.75 | 1.81 | 5.86 | 0.53 |
| 3 | Computer and mathematical | 0.053 | 0.64 | 2.12 | 1.51 | 0.65 |
| 4 | Architecture and engineering | 0.042 | 0.64 | 2.26 | 0.49 | 0.65 |
| 5 | Life, physical, and social science | 0.014 | 0.77 | 3.87 | 0.77 | 0.18 |
| 6 | Community and social service occupations | 0.016 | 1.46 | 2.91 | 2.45 | 0.25 |
| 7 | Legal | 0.021 | 0.63 | 3.41 | 1.19 | 0.17 |
| 8 | Education, training, and library | 0.069 | 1.24 | 1.51 | 15.55 | 0.14 |
| 9 | Arts, design, entertainment, sports, and media | 0.014 | 0.87 | 3.58 | 0.87 | 0.21 |
| 10 | Healthcare practitioners and technical | 0.068 | 2.50 | 1.41 | 11.31 | 0.04 |
| 11 | Healthcare support | 0.009 | 2.72 | 2.60 | 4.21 | 0.02 |
| 12 | Protective service | 0.030 | 68.64 | 1.70 | 0.65 | 0.68 |
| 13 | Food preparation and serving related | 0.012 | 6.92 | 1.96 | 3.12 | 0.52 |
| 14 | Building and grounds cleaning and maintenance | 0.017 | 2.00 | 2.00 | 2.94 | 0.81 |
| 15 | Personal care and service | 0.008 | 3.31 | 2.59 | 2.80 | 0.11 |
| 16 | Sales and related | 0.091 | 1.21 | 1.05 | 7.33 | 1.35 |
| 17 | Office and administrative support | 0.085 | 1.37 | 1.28 | 34.97 | $5 \times 10^{-5}$ |
| 18 | Farming, fishing, and forestry | 0.004 | 3.90 | 3.17 | 0.53 | 0.26 |
| 19 | Construction and extraction | 0.055 | 0.82 | 1.41 | 0.17 | 1.88 |
| 20 | Installation, maintenance, and repair | 0.042 | 1.07 | 1.59 | 0.28 | 1.33 |
| 21 | Production | 0.057 | 3.20 | 1.05 | 4.23 | 1.89 |
| 22 | Transportation and material moving | 0.045 | 2.69 | 1.13 | 1.52 | 1.71 |

Panel B: Rest of Parameters

| | |
|---|---|
| $\rho$ | 0.48 |
| $\nu_f$ | 0.43 |
| $\nu_m$ | 0.57 |

Note: Panel A shows the values of the parameters that are specific to the different occupations and Panel B the values obtained for the utility function, $\nu_m$ and $\nu_f$, for males and females, respectively. In addition, Panel B presents the value obtained for the parameter that governs the elasticity of substitution of the technology for household care, $\rho$.

In the baseline model (second row) the gender wage gap is 8.9 percent, this moment was not targeted. The model predicts a within component of 7.2 percent which accounts for 30 percent of the within component in the data. The model also generates a between component of 1.7 percent. The endogenous channel in our model– the interaction between preferences and coordination costs– has implications for the both the within and between components. Although this channel influences mostly the within component it also affects the between component because it affects how women sort into occupations. While it explains a substantial component of the within component it does not account for the majority, indicating that there are other forces in the economy that affect the gender wage gap within an occupation.

## 6.3 Counterfactual Experiments

In this section we conduct counterfactual experiments to assess the impact of various parameters on the gender wage gap. The key parameters of interest are the $\alpha$'s which reflect coordination costs, the $\nu$'s which reflect preferences for consumption and for household care, and $\rho$ which determines the elasticity of substitution between household care at different times of the day.

### 6.3.1 Coordination of Schedules and the Gender Wage Gap

In the first experiment we set $\alpha$ to be equal across occupations. We set $\alpha$ at a relatively high value of 2.72 (reflecting low coordination costs) which is the value estimated for "Health Care Support." One motivation for such an experiment is the introduction of a new technology such as on-line connections and internet technology. The effect is lower costs of coordinating with other workers. Since in this experiment women still have a higher preference for household care (lower $\nu$), everything else equal, they work less and allocate more hours to home production relative to men. However, the costs of doing so are lower.

Table 11: Regressions: Model vs. Data

| | Data | Model |
|---|---|---|
| female | -0.272*** | -0.06 |
| | (0.004) | |
| ratio8to5 | 0.086*** | 0.29 |
| | (0.002) | |
| femaleXratio8to5 | -0.015*** | -0.04 |
| | (0.004) | |

Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$. Note: This table shows the estimates of the regression using individual data for married workers with children (column Data) for 22 occupations and the estimates of the same regression using data generated by the model in its baseline calibration (column Model). The dependent variable is earnings per hour.

The gender gap falls from 8.9 percent (baseline) to 6.3 percent. As shown in the third row of Table 12 the within component falls from 7.2 percent to 2.0 percent. The within component falls substantially because with a relatively high $\alpha$, the penalty for not working during prime time is lower. As a result, despite women's larger supply of household care, their earnings per hour are now much closer to those of males. Figure 5 shows the within component of the gender gap (vertical axis) when this counterfactual is repeated for different values of $\alpha$ (horizontal axis). Low values of $\alpha$ such as that for "Management," for example, imply a large within component of around 10 percent. As $\alpha$ becomes larger the coordination costs become negligible and the within occupation gender gap approaches zero. Figure 5 shows that there is little difference between moderately high $\alpha$'s and very high $\alpha$'s– that is, once $\alpha$ reaches a value of 5 and greater, the within-occupation gender gap essentially disappears.

The between component rises when we equalize $\alpha$'s across occupations. Both males and females move to occupations with initially low $\alpha$'s because the coordination penalty is now lower. These occupations are even more attractive to women

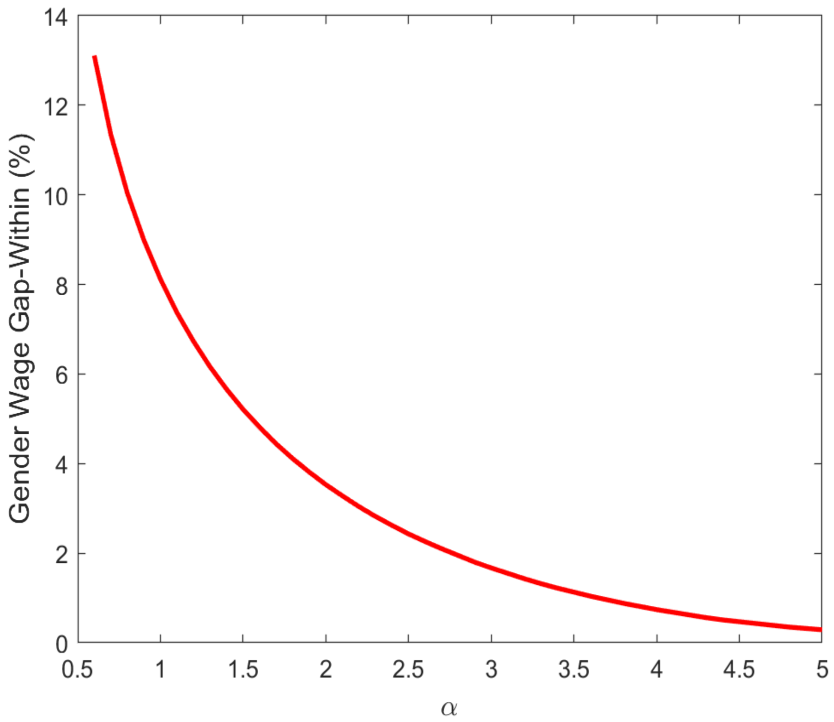


Figure 5: Gender Earnings Gap Within Occupations: The Effect of $\alpha$

Notes: The figure shows the value of the within component of the gender wage gap (y-axis) when the parameter $\alpha$ (x-axis) is equal for every occupation and takes values from 0.6 (the minimum estimated value for our baseline economy) to 5.

so the female share rises in these occupations. This effect by itself increases the between component, because low-$\alpha$ occupations tend to pay more. To assess the size of this effect, in Table 12 we separately report the gender wage gap between occupations holding earnings and occupation sizes fixed at their baseline values. This column, which we label "Sorting," isolates the effect of rising female share in initially low $\alpha$ occupations. In this case the between occupation gender gap is 0.2. However, in equilibrium, earnings and occupation sizes also change. Low-$\alpha$ occupations get larger and their earnings rise (because the coordination costs are now smaller in these occupations). Because the fraction of men is larger in high-earnings occupations, and these occupations increase in size and earnings because now $\alpha$ is higher, the between component of the gender gap rises.

Table 12: Gender Earnings Gap (%)

| | Overall | Between | Between (Sorting) | Within |
|---|---|---|---|---|
| Data | 23.2 | $-0.9$ | - | 24.1 |
| Baseline | 8.9 | 1.7 | - | 7.2 |
| Equal $\alpha$ ($\alpha = 2.72$) | 6.4 | 4.4 | 0.2 | 2.0 |
| 50% Drop in $\nu_m - \nu_f$ | 6.6 | 3.0 | 0.4 | 3.6 |
| Increase in $\rho$ | 9.7 | 4.7 | 1.2 | 5.0 |

#### 6.3.2 A Change in Female Household Care Hours

In this experiment we reduce the difference between male and female preferences for household care. One possible interpretation is that a change in social norms equalizes the household care responsibilities of males and females. We reduce the gap in the $\nu$'s by 50 percent by reducing $\nu_m$ to 0.535 and raising $\nu_f$ to 0.465. The within component falls from 7.2 percent to 3.6 percent. The reason for the fall is that an increase in $\nu_f$ increases the amount of work during prime time. This lowers the penalty that females face.

An alternative way of looking at this counterfactual is shown in Figure 6. The horizontal axis measures the distance between $\nu$'s (a value of 0.14 is equal to the baseline and a value of 0 means $\nu_m = \nu_f$). On the vertical axis we measure the within component of the gender gap. As the distance between the $\nu$'s drops, the within component goes to zero. The rate at which it drops to zero depends on the occupation. As occupations are defined by their $\alpha$, we plot the within component against the within component for occupations with a small value of $\alpha$, 0.6; a middle value, 1.5; and a high value, 12. When $\alpha$ is large, i.e. coordination costs are low, the within component is virtually zero even when women supply substantially more home care than men. For an occupation such as "Architecture and Engineers" with ($\alpha = 0.64$), then the within gender gap is low only when preferences between males and females are similar.

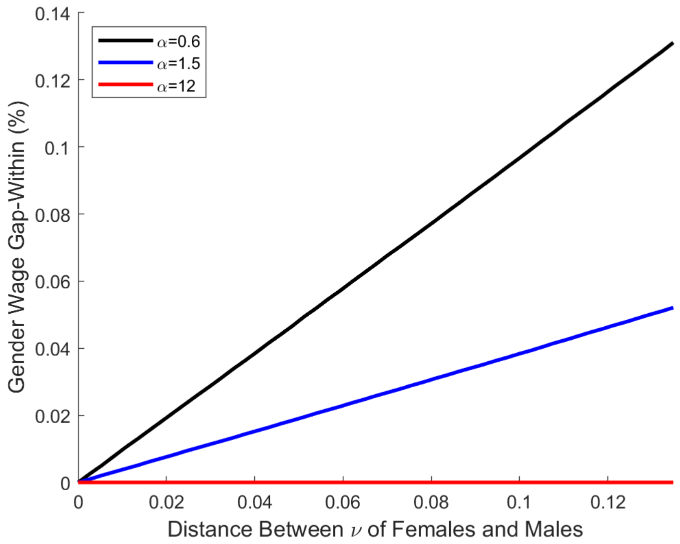


Figure 6: Gender Earnings Gap Within Occupations: The Effect of $\nu$

Notes: The figure shows the value of the within component of the gender wage gap (y-axis) when we change the difference between females and males in the value of parameter $\nu$ (x-axis) for different values of $\alpha$. A value of 0 on the x-axis indicates that $\nu_m = \nu_f$.

Interestingly, the between component rises. As a result of the $\nu$'s changing, women are now more likely to move into low $\alpha$ occupations. This sorting effect alone reduces the between occupation gender gap from 1.7 in the baseline case to 0.4. However, in equilibrium, earnings and occupation sizes change. In this case, because women now prefer to work more, their labor supply rises. This happens in all occupations, but the effect is bigger in occupations which are relatively more populated by women. As a result, wage rates in female-intensive occupations fall (responding to the larger supply) leading to an increase in the between component from 1.7 to 3.0.

### 6.3.3 A Change in the Ability to Smooth Household Care During the Day

In our model, the value of $\rho$ determines the elasticity of substitution between household care time during the two parts of the day. A high value of $\rho$ means that it is relatively easy to substitute household care activities throughout the day. In our baseline calibration $\rho = 0.48$ which indicates household care activities are fairly substitutable but imperfectly so. Although the timing of these activities may be difficult to change (reflecting an imperfect degree of substitution), someone other than the parent could be responsible for undertaking them. For example, curricular education normally takes place in a school during normal business hours, but parents outsource that activity to school teachers and staff. As shown in Section 2.2 we focus on care (i.e. doctor's appointments, school meetings, homework supervision) which may be hard to outsource. What exactly determines the degree of substitution is not clear. One interpretation is that there are constraints on the time of the day in which some activities take place. For example, an appointment with a school teacher normally takes place before 5pm. An alternative interpretation is that they reflect parenting styles of modern societies, a recent phenomenon that has been extensively studied for instance by Doepke and Zilibotti (2019).

In order to study the effect of changes in the ability to substitute household care time during the day, we perform a counterfactual exercise in which we increase $\rho$ to 0.65. As in our baseline case, women put more value on household care activities and allocate more time to household care relative to men. The main difference is that compared to the baseline case women can now more easily distribute the household care to off-peak times so they do not incur a productivity loss. As a result, the within gender wage gap decreases from 7.2 percent to 5.0 percent as predicted. The increase in $\rho$ has little effect on sorting. However, there is again a substantial increase in the between occupation gender gap in equilibrium. Productivity and earnings rise in low $\alpha$ occupations. Since men initially had higher representation in these occupations, the between occupation component of the gender wage gap rises.

# 7 Final Remarks

Although women have made remarkable gains in the labor market over the past five decades, there is still a substantial gap in their earnings relative to men. Most of the unexplained gap is associated with earnings gaps that arises within occupations. In this paper we explore a mechanism which can explain why the gender gap differs across occupations.

Central to our analysis is the joint decision of workers to allocate time to market work and to household care. Using time-diary data we document that married women with children who report being full-time workers work less on the job and do more household care than their male counterparts. We also document that occupations vary in the degree to which total hours worked in the occupation are concentrated during peak hours of the day– a measure which we interpret as reflecting the degree of coordinated work schedules in the occupation. Our measure of an (in)flexible work schedule is therefore distinct from other papers in the literature which focus on the quantity of hours worked. We find that while men and single women receive a wage premium in occupations with concentrated schedules, married women with children much less of one. Conditional on being in an occupation, less working time (more household care time) at peak hours of the day entails a productivity loss and thus earnings are lowered for women relative to men. We calibrate our model to US data and show that the greater demand for household care time by women together with the coordination of work time required in different occupations generates a gender wage gap of 8.9 percent which corresponds to approximately 40 percent of the observed gender earnings gap among married men and women with children. As in the data, most of the gender wage gap is within occupations. The value predicted by the model is 7.2 percent which accounts for 30 percent of the one observed in the data. If occupation-level coordination was set equal to the level of "Health Care Support"– an occupation with relatively low coordination, the within-occupation gender gap due to women's higher demand for household time falls by more than half to 2.0 percent.

Our paper provides new insights by studying the interplay of family constraints and the coordination of schedules and its effect on women's wages relative to men's. We present a rich static model but the constraints we study in this paper may well have dynamic implications. For example, the inability to provide hours during peak times may result in less human capital accumulation for women, such that their wage disadvantage may persist even well after childrearing, amplifying the effect of the coordination friction on the gender wage gap. We leave these important topics for future research.

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# Appendix (Not for Publication)

## A.1 Data and Variables Description

### A.1.1 ATUS sample

We base our analysis on the 2003-2014 American Time Use Surveys (ATUS). One respondent per household is drawn from the Current Population Survey samples and the interviews are conducted 2 to 5 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 two activities, "work and work-related activities" and "caring for and helping household members". 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 of all household members. We match spouses using the household roster to incorporate labor force status and hours of the spouse. Our main sample of ATUS time diary respondents consist of 106,620 adults who are 18 to 65 years old. In comparing time use of men and women we focus on full-time workers (those whose usual weekly hours worked was greater or equal to 35), resulting in 66,023 observations.[33] We make no other restrictions—notably we include self-employed workers and multiple-job holders. In comparisons of time use across gender, we examine separately married men and women with at least one child, and single men and women with no children. We define "married" as those who are married with spouse present. Spouse is based on marriage and not co-habitation. Presence of children is based on the presence

[33]We exclude approximately 3.3 percent of workers who report that their "hours vary".

of own children under 18 as opposed to children in the household under 18.

### A.1.2 Construction of *ratio8to5*

To construct the ratio of hours worked in the 8 to 5 time interval at the occupation level we make further restrictions to the ATUS sample above. We keep 18-65 year old full-time workers who worked full-time (minimum of 35 hours) in their main job, which results in a sample of 62,811 observations. We construct at the detailed 2002 Census occupation code level, the sum of total hours worked during the 8 to 5 time interval as well as total hours worked overall among our sample of time-use respondents. Individual hours are weighted by the person-specific ATUS final weight. The ratio of the two sums is our coordination measure at the occupation level. The raw ratios are reported in Appendix Table A.7. We calculate 493 non-missing ratios at the 2002 Census occupation code level. As the Appendix Table A.7 shows, there are many occupations with very small numbers of full-time workers. Therefore, we weight correlations of our measure with other O*NET characteristics using the total number of full-time workers who are 18-65 (at the occupation level) as weights. We also weight each individual by their ATUS final weight. We have also conducted robustness checks keeping only those occupations with at least 100 observations from the ATUS sample. This resulted in 144 detailed occupations. Regression results based on this reduced set of occupations were even stronger. Results available upon request.

### A.1.3 Construction of the Concentration Index

We also constructed Herfindahl indices to measure concentration of hours worked at the occupation-level. This measure has the advantage of not picking any given time of the day as the "peak" in an arbitrary fashion and additionally incorporates information across days of the week as well as hours of the day. Let $k$ delineate day of the week by hour of the day bin and let $work_j^k$ be the number of hours worked in bin k by 18-65 year old full-time workers in occupation $j$. $work_j$ equals the total number of hours worked by 18-65 year old full-time workers in occupation $j$. Individual hours are weighted by the person-specific ATUS final weight. $share_j^k$ is $k$'s share of total hours worked in occupation $j$ analogous to market share of a firm in a given industry. The concentration ratio (Herfindahl index) for occupation $j = \sum_k (share_j^k)^2$. We only keep occupations which have observations across all 7 days of the week, which results in 322 occupations.

#### A.1.4 O*NET Measures

In order to relate our coordination measure with other occupation-level skill and job characteristic measures, we downloaded O*NET skill and job characteristics measures from O*NET 24.2 (downloaded in March 2020). The O*NET database contains information on abilities, skills, tasks and work activities associated with detailed occupations. We downloaded 5 measures in the "Work Activities" category that appeared to us to require coordination with other workers: "Assisting and caring for others," "Coaching and developing others," "Developing and building teams," "Establishing and maintaining interpersonal relationships," "Training and teaching others," and "Guiding, directing, and motivating subordinates." We also downloaded a measure in the "Work Context" category: "Face-to-face discussions" as well as a measure in the "Work Styles" category: "Social orientation." In addition to these measures, we also downloaded skill measures used by Deming (2017), Acemoglu and Autor (2011) and Denning, Jacob, Lefgren, and vom Lehn (2019).

- For "Social skills" we follow Deming (2017) and use four measures: "Social perceptiveness: being aware of others' reactions and understanding why they react as they do," "Coordination: adjusting action in relation to other's actions," "Negotiation: bringing others together and trying to reconcile differences," and "Persuasion: persuading others to change their minds and behavior." We create a composite score for "Social Skills" by averaging the 4 individual scores.

- We also construct 4 other composite measures of skill requirements closely following Acemoglu and Autor (2011) and Denning, Jacob, Lefgren, and vom Lehn (2019).

- For "Abstract Analytical Skills" we average the following 3 measures: "Interpreting the Meaning of Information for Others: translating or explaining what information means and how it can be used," "Thinking Creatively: developing, designing, or creating new applications, ideas, relationships, systems, or products, including artistic contributions," and "Analyzing Data or Information: identifying the underlying principles, reasons, or facts of information by breaking down information or data into separate parts."

- For "Manual Skills" we averaged the following 4 measures: "Spend Time Using Your Hands to Handle, Control, or Feel Objects, Tools, or Controls: how much does this job require using your hands to handle, control, or feel objects, tools or controls," "Manual Dexterity: the ability to quickly move your hand, your hand together with your arm, or your two hands to grasp, manipulate, or assemble objects," "Operating Vehicles, Mechanized Devices, or Equipment: running, maneuvering, navigating, or driving vehicles or mechanized equipment, such as forklifts, passenger vehicles, aircraft, or water craft," and "Spatial Orientation: the ability to know your location in relation to the environment or to know where other objects are in relation to you."

- For "Routine Skills" we averaged the following 5 measures: "Controlling Machines and Processes: using either control mechanisms or direct physical activity to operate machines or processes (not including computers or vehicles)," "Spend Time Making Repetitive Motions: how much does this job require making repetitive motions," "Pace Determined by Speed of Equipment: how important is it to this job that the pace is determined by the speed of equipment or machinery," "Importance of Being Exact or Accurate: how important is being very exact or highly accurate in performing this job," and "Importance of Repeating Same Tasks: how important is repeating the same physical activities or mental activities over and over, without stopping, to performing this job."

O*NET measures are reported for detailed 2018 Standard Occupation Code (SOC). We downloaded the Census crosswalk between 2018 SOC codes and 2010 Census Occupation codes https://www.census.gov/topics/employment/industry-occupation/guidance/code-lists.html. The number of detailed occupations is smaller in the 2010 Census occupation codes than in the 2018 Census occupation codes. We utilize the 2018 American Community Survey to take weighted averages to more aggregate 2010 Census occupation codes. There were also a number of changes between 2002 and 2010 Census codes. We use the number of 18-65 full-time workers aged 18-65 in the American Time Use Survey (ATUS) as weights to aggregate O*NET measures to the 2002 Census occupation codes. We end up with 430 detailed occupations from the O*NET which we merge with the data from the ATUS.

### A.1.5 Shift Work

We use the 2004 Current Population Survey May Work Schedules and Work at Home Supplement to calculate the fraction of workers in detailed occupations who are shift workers. We define as shift workers those who worked "Evening shift," "Night shift," "Rotating shift," "Split shift," "Irregular schedule," or "Some other shift." We keep only 18-65 olds whose usual hours worked in their main job is $>=$35. We also use CPS weights to calculate the share of workers in the occupation who are shift workers.

### A.1.6 Share of Males who Work Long Hours

We use all individuals in the Current Population Surveys 2003-2014 including those who are not ATUS respondents to calculate the share of males who work long hours. More specifically, we select males who are 18-65 years old who have at least some college education. We calculate by detailed 2002 Census occupation category the share in this population who worked 50 or more hours. CPS weights are used in calculating these shares. We end up with 490 non-missing measures at the detailed occupation level.

## A.2 Model with Two-Earner Households

We extend the single-agent version of the model described in 3 to a version with a unitary household that chooses time allocation and occupation for its two members. We assume both members' utilities have the same weight. Besides preferences aggregating preferences at the householdlevel, there are other differences with respect to the single-member households. The tastes distributions are now over combinations of two-occupations. Formally, the problem of the household is to choose occupations for both husband and wife, as well as time and consumption allocations. Denoting male and female by the superscripts $m, f$, the value of choosing occupation $i$ for the husband and $j$ for the wife is,

$$V(\theta_{i,j}) = \theta_{i,j} \left\{ \max_{l^m_{i,1}, l^m_{i,2}, h^m_{i,1}, h^m_{i,2}, l^f_{j,1}, l^f_{j,2}, h^f_{j,1}, h^f_{j,2}} \left\{ \delta_m u(c^m, h^m) + \delta_f u(c^f, h^f) \right\} \right\} \tag{24}$$

$$s.t. \tag{25}$$

$$c^m = (l^m_i w_i + l^f_j w_j) \frac{\delta_m}{\delta_m + \delta_f} \tag{26}$$

$$c^f = (l^m_i w_i + l^f_j w_j) \frac{\delta_f}{\delta_m + \delta_f} \tag{27}$$

$$h^m_{i,2} + l^m_{i,2} = 0.5 = h^f_{j,2} + l^f_{j,2} \tag{28}$$

$$h^m_{i,1} + l^m_{i,1} + h^m_{i,2} + l^m_{i,2} = 1 = h^f_{j,1} + l^f_{j,1} + h^f_{j,2} + l^f_{j,2} \tag{29}$$

$$l^f_j = l^f_{j,1} + l^f_{j,2} - (0.5 - l^f_{j,1})^{\alpha_j} \quad with \quad \alpha_j \geq 0 \tag{30}$$

$$l^m_i = l^m_{i,1} + l^m_{i,2} - (0.5 - l^m_{i,1})^{\alpha_i} \quad with \quad \alpha_i \geq 0 \tag{31}$$

$$h^f_j = \left[ (h^f_{j,1})^\rho + (h^f_{j,2})^\rho \right]^{\frac{1}{\rho}} \tag{32}$$

$$h^m_i = \left[ (h^m_{i,1})^\rho + (h^m_{i,2})^\rho \right]^{\frac{1}{\rho}} \tag{33}$$

where $\delta_m$ and $\delta_f$ are Pareto weights for each member of the household ( in this example, $\delta_m = \delta_f$).

$$\widehat{i,j} = argmax \left\{ V_{1,1}, V_{1,2}, \ldots, V_{J,J} \right\}, \tag{34}$$

where, as in the case of a single-earner household, the notation $V_{i,j}$ implicitly makes the value function dependent on a draw $\theta_{i,j}$. This draw now represents the taste shock for a household when the husband works in occupation $i$ and the wife works in occupation $j$.

Once households have sorted their members into different occupations and chosen their time allocation optimally, the aggregation and the equilibrium definition are identical to the single earner household case.

Where appropriate, we use the same parameter values as those of the single agent models show in section 3. An important additional feature of the two-earner household setup is the degree of assortative matching in occupations between spouses. In particular, the degree of similarity in the needs for schedule coordination among spouses' occupations. In the experiments shown below we evaluate two extremes. First, a high positive assortative matching, in which the spouses' occupations $ratio8to5$ have a correlation of 0.4. The second is a high negative assortative matching, in which the spouses' occupations $ratio8to5$ have a correlation of -0.4.

Because the ATUS dataset provides information on the spouse's occupation, we can calculate the degree of assortative matching in the data. Given the $ratio8to5$ of the occupations of the two spouses, the correlation between $ratio8to5$ is 0.13. This number represents a weak level of positive assortative matching. We solve the two-earner household two-occupation economy so that it delivers the observed degree in assortative matching.

We force the economy to deliver a particular correlation pattern among spouses' occupations the following way. Because the distribution of taste shocks is over pairs of occupations, positive assortative matching occurs when the masses of pairs of similar occupations are large (relative to mass points of pairs of occupations that are different). The masses of occupations are controlled by the means of the taste shock distributions. In all the experiments shown using the two-earner household, the economy also delivers half of the workforce in each occupation to be female.

The results for the economies populated by two earner households are given on Table A.1. The moments shown are the same as in section 3. Panel (A) shows the case of strong and positive assortative matching. The taste shock distribution makes occupation 1 (high coordination needs) much larger — two-thirds of workers are employed in 1. The combination of having at least 50% share of females in each occupation plus spouses liking the same occupation, makes occupation 1 larger. A larger fraction of women (two-thirds) works in occupation 1 as a result. This makes earnings in occupation 1 far lower than in occupation 2 (0.19 vs 0.79). Both measures of labor — raw and effective — are also much lower in occupation 1 than in 2. Consequently, the earnings gender gap is large in occupation 1 (10%) and small in occupation 2 (0.3%). These patters get reversed in Panel (B) where the correlation among $ratio8to5$ between spouses is negative. A larger number of women work now in occupation 2 (despite the fraction of workers who are female in that occupation being 50%), so hours worked are higher in occupation 1 than in occupation 2, and so is earnings. Gender gaps across occupations closer to each other (3.5% vs 1.3%). What does the empirical degree of assortative matching imply for these moments? It is instructive to compare Panel C of Table A.1 to the last panel of Table 5, to see if much is lost by focusing in single-earner as opposed to two-earner households. The largest difference between the two economies is the size of the two occupations and the difference in earnings across occupations. All other numbers shown in Table A.1 are close to those shown in Table 5. In particular the similarity in raw labor, effective labor and the $ratio8to5$. The size of the occupation as well as earnings are sensitive to the value of the occupation shares in the aggregate production function. Overall, given that the degree in assortative matching in the data is rather weak (and we lack data on time allocation at the household level), little seems to be lost by focusing on single individuals as opposed to two-earner households.

Table A.1: A Simple Case with Two-Earner Households

| Occupation | % Workers | Bunching Ratio | Earnings | $l_1 + l_2$ | $l$ | % Females | E. Gap |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Panel A: Positive Assortative Matching | | | | | | | |
| 1 | 67 | 0.65 | 0.19 | 0.77 | 0.73 | 50 | 1.104 |
| 2 | 33 | 0.51 | 0.79 | 0.84 | 0.83 | 50 | 1.003 |
| Gender Earnings Gap | 1.071 | | | | | | |
| Panel B: Negative Assortative Matching | | | | | | | |
| 1 | 41 | 0.57 | 0.56 | 0.86 | 0.84 | 50 | 1.0345 |
| 2 | 59 | 0.53 | 0.27 | 0.74 | 0.73 | 50 | 1.013 |
| Gender Earnings Gap | 1.022 | | | | | | |
| Panel C: Observed Assortative Matching | | | | | | | |
| 1 | 53 | 0.61 | 0.35 | 0.81 | 0.78 | 50 | 1.059 |
| 2 | 47 | 0.51 | 0.44 | 0.81 | 0.80 | 50 | 1.005 |
| Gender Earnings Gap | 1.034 | | | | | | |

Note: This table shows the results for economies with two-earner households. The experiments are analogous to those shown in 3 for single-agent economies. Each of the panels represents a different economy. The differences arise because the distribution of taste shocks leads to different degrees of assortative matching. In Panel (A) the economy feature positive assortative matching. The correlation of occupations' *ratio8to5* across spouses is 0.4. Panel (B) features the opposite degree of assortative matching; in this case, negative, with a correlation of -0.4. Finally Panel (C) calibrates the distribution of shocks so that the economy delivers the degree of assortative matching observed in the data. The correlation between spouses' occupations is 0.13.

## A.3 Event-Study around Childbirth: Evidence from Panel Data

An angle missing from our analysis is any reference to the dynamic effects of working in high *ratio8to5* relative to low *ratio8to5* occupations. In this section, we provide an event study analysis to examine how childbirth affects women's earnings (per hour) when they are employed in occupations sorted by $ratio8to5$. For this purpose we need a panel of individuals/households, different from the cross-sectional data we have used in our analysis. We also need to classify the workforce by occupation which requires a wealth of observations in the cross-section and in the time dimensions. Thus, a natural candidate is the Panel Survey of Income Dynamics (PSID). Although this dataset have clear advantages, it has some issues regarding the classification of occupations. From 1981 to 2009 it uses three different occupational classifications. Because of this change in the way the PSID classifies occupations, we opt to use the files provided by the Cross National Equivalent Files (see Frick, Jenkings, Lillard, Lipps, and Wooden (2007)) has the advantage of harmonizing the occupations of the PSID for all the years since 1981. For these reasons, we use the CNEF and conduct an event study similar to the one in Kleven, Landais, Posch, Steinhauer, and Zweimüller (2019), i.e. focusing on the effects of childbirth on the earnings per hour of females. Specifically, in the event-study specification, for each parent in the data, event time $t$ is indexed relative to the year of the first childbirth. Denoting by $y_i t$ is earnings per hour of female $i$, at year $s$ and at event time $t$, we run the following regression:

$$y_{ist} = \sum_{j=0}^{4} \alpha_j \mathbb{1}_{j=t} + \sum_{k} \beta_k \mathbb{1}_{k=age_{is}} + + \sum_{h} \gamma_h \mathbb{1}_{h=s} + u_{ist}.$$

We group the observations in six event time dummies: between five and one years before the event (period -1), between two years before and one year after the event (period 0), 2 and 3 years after the event (period 1), 4 and 5 years after (period 2), 6 and 7 years after (period3) and 8,9 and 10 years after (period 4). The first term on the right-hand side includes event-time dummies, ranging from five years before the child is born to ten years after. We actually group the observations in six event time dummies: between five and one years before the event, between two years before and one year after the event, 2 and 3 years after the event, 4 and 5 years after, 6 and 7 years after and 8,9 and 10 years after. We omit the first event-time dummy (at $t = -1$), implying that the event-time coefficients measure the impact of children relative to the period just before the first childbirth. The second term includes age dummies (to control for life cycle trends), and the third term includes year dummies (to control for time trends). Kleven, Landais, and Sogaard () lays out the identification assumptions underlying this approach and provides evidence of its ability to identify the causal effect of parenthood.

We estimate the regression for all females and then for female workers in two different groups of occupations: high $8to5ratio$ and low $8to5ratio$. To form these groups of occupations we rely on our $8to5ratio$ estimates using the ATUS-CPS data. Unfortunately, there is not a direct mapping between the classification of occupations on the CPS-ATUS and the PSID-CNEF so we proceed by matching them according to their definition. Table A.2 show the mapping of occupations between the two data sets and the corresponding $8to5ratio$.

Table A.3 show the estimated coefficients. The first row of the table show the estimates for all the occupations in the sample. The second and third row for the group of low and high $ratio8to5$ occupations, respectively.

In figure 7 we plot the coefficients for the low and high $8to5ratio$ occupations.

As it is clear in the table and reflected in the figure, in both type of occupations there is a substantial drop in earnings per hour at impact and 2-3 years after giving birth. One can interpret this results as similar to the one obtained in our baseline regression analysis using the ATUS-CPS. However, what is interesting here is that in the case of high $8t5ratio$ occupations the effect is persistent whereas it is transi-

Table A.2: Mapping of Occupations: CPS and CNEF-PSID

| ratio8to5 | Occupation CPS | Occupation CNEF-PSID |
|---|---|---|
| **Low ratio8to5 Occupations** | | |
| 0.710 | (Major group 11) Healthcare Support | (7) Related Medical Job |
| 0.505 | (32) Musician, Singers and Related Workers | (17) Music/Perform |
| 0.734 | (195) Computer Operator | (34) Computer Operator |
| 0.547 | (52) Nursing, Psychiatric, and Home Health Aides | (52) HH Supervisor |
| 0.571 | (64) Food Cooking, Machine Operators and Tenders | (53) Cook/Waiter |
| 0.767 | (232) Maid and Housekeeping Cleaners | (54) Domestic Help |
| 0.624 | (98) Janitor and Building Cleaners | (55) Janitor |
| 0.657 | (126) Laundry and Dry-Cleaning Workers | (56) Dry-Cleaner |
| 0.533 | (42) Security Guards and Gaming Surveillance Officers | (58) Security Service |
| 0.667 | (Major group 15) Personal Care and Service | (59) Service Worker |
| 0.696 | (154) Farm, Ranch, and Other Agricultural Managers | (61) Farm Manager |
| 0.653 | (121) Farmers and Ranchers | (62) Farm Hand |
| 0.304 | (7) Fishers and Related Fishing Workers | (64) Fisher/Hunter |
| 0.673 | (134) Inspectors, Testers, Sorters, Samplers, and Weighers | (70) Inspector |
| 0.404 | (14) Derrick, Rotary Drill, and Service Unit Operators, Oil, Gas, and Mining | (71) Miner |
| 0.568 | (62) Chemical Technician | (74) Chemical Worker |
| 0.468 | (22) Shoe and Leather Workers and Repairers | (80) Shoemaker |
| 0.663 | (129) Tool and Die Makers | (83) Tool/Die Maker |
| 0.708 | (166) Broadcast and Sound Engineering Technicians and Radio Operators | (86) Broadcaster |
| 0.709 | (170) Jewelers and Precious Stone and Metal Workers | (88) Jewelry Maker |
| 0.637 | (111) Transportation Attendants | (98) Transportation Operator |
| **High ratio8to5 Occupations** | | |
| 0.825 | (Major Group 4) Architecture and Engineering | (2) Architect/Engineer |
| 0.780 | (247) Engineering Technicians, Except Drafters | (3) Enginnering Technician Expert |
| 0.830 | (Major Group 7) Life,Physical, and Social Sciences | (5) Life/Physical Science |
| 0.824 | (337) Lawyers | (12) Lawyer |
| 0.829 | (353) Elementary and Middle School Teachers | (13) Educator |
| 0.931 | (480) Library Assistants, Clerical | (14) Cleric |
| 0.760 | (221) Writers and Authors | (15) Author |
| 0.756 | (218) Athletes, Coaches, Umpires, and Related Workers | (18) Professional Athlete |
| 0.892 | (454) Bookkeeping, Accounting, and Auditing Clerks | (33) Bookkeeper/Cashier |
| 0.825 | (339) Office and Administrative Support Workers, All Other | (39) Office Worker, etc. |
| 0.831 | (355) Other Business Operations Specialists | (41) Business Operator |
| 0.844 | (385) Parts Salespersons | (43) Technical Salesperson |
| 0.863 | (425) Sales and Related Workers, All Other | (45) Vendor |
| 0.785 | (253) Sales Representatives, Services, All Other | (49) Salesperson |
| 0.779 | (246) Cabinetmakers and Bench Carpenters | (81) Cabinet Maker |
| 0.818 | (346) Pipelayers, Plumbers, Pipefitters, and Steamfitters | (87) Pipe Fitter |
| 0.854 | (405) Glaziers | (89) Glazier |
| 0.838 | (372) Painters, Construction and Maintenance | (93) Painter |
| 0.819 | (327) Carpenters | (95) Briclay/Carpenter |

Note: These .

Table A.3: Regression Child Penalty

| | All Occs | Low $ratio8to5$ | High $ratio8to5$ |
|---|---|---|---|
| $\alpha_[-2,1]$ | -0.302 | $-0.462$ | 0.0178 |
| | (0.186) | (0.238) | (0.280) |
| $\alpha_[2,3]$ | -1.377 | $-0.837$ | -1.312 |
| | (0.236) | (0.294) | (0.356) |
| $\alpha_[4,5]$ | -1.333 | $-0.654$ | -1.456 |
| | (0.258) | (0.314) | (0.392) |
| $\alpha_[6,7]$ | -1.525 | $-0.176$ | -1.569 |
| | (0.282) | (0.344) | (0.421) |
| $\alpha_[8,10]$ | -1.181 | 0.528 | -1.520 |
| | (0.283) | (0.351) | (0.413) |

*Note*: Standard errors in parenthesis

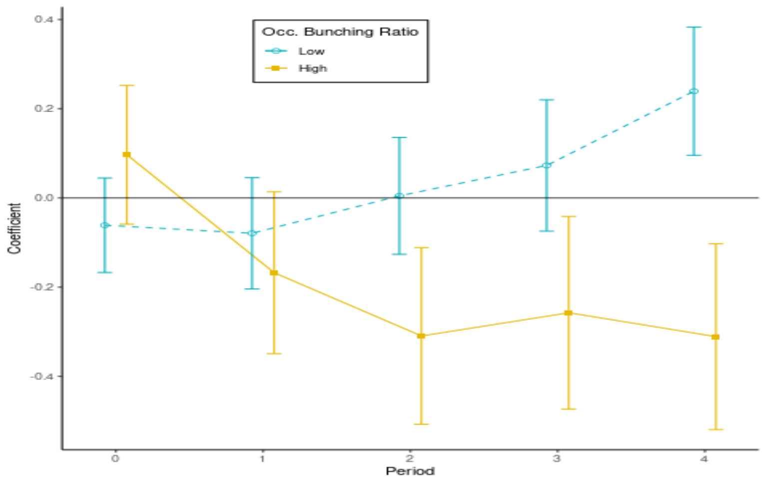


Figure 7: The Child Penalty in Low and High $ratio8to5$ Occupations

Notes: The coefficient represents the drop in earnings per hour (as a log difference) relative to the period prior to childbirth ( between 5 and 3 years before childbirth). terms

tory in the case of low $8t5ratio$ occupations. Although this can be object of another paper but following the referee's idea, our interpretation is that conditional on being in a high $8t5ratio$ occupations the human capital losses are more important earning losses persist. There are many aspects associated with this result that we are abstracting for and that are beyond the scope of our paper but are nonetheless interesting to discuss. For example, we have focused the analysis on the occupation workers have before giving birth but it could be the case that part of the earning loss in high 8*t*5*ratio* occupations is partially explained by an occupational switch. Females that were in such an occupation switch to a lower pay occupation after having a kid providing these occupations are less compatible with the demand of time from childcare.

## A.4 Tables

Table A.4: Classification of ATUS Activities among Routine Care, Enrichment Care, and Other

| | |
|---|---|
| **Routine Childcare** | |
| 030101 | Physical care of household children |
| 030109 | Looking after children as a primary activity |
| 030301 | Providing medical care to household children |
| **Enriching childcare (children of all ages)** | |
| 030102 | Reading to/with household children |
| 030103 | Playing with household children, not sports |
| 030104 | Arts and crafts with household children |
| 030105 | Playing sports with household children |
| 030106 | Talking with/listening to household children |
| 030107 | Helping/teaching household children (not related to education) |
| 030201 | Homework (household children) |
| 030203 | Home schooling of household children |
| **Enriching childcare (children ages 2+)** | |
| 1201 | Socializing and communicating |
| 120307 | Playing games |
| 120309 | Arts and crafts as a hobby |
| 120310 | Collecting as a hobby |
| 120311 | Hobbies, except arts 8c crafts and collecting |
| 120401 | Attending performances |
| 120402 | Attending museums |
| 120403 | Attending movies/films |
| 1301 | Participating in sports, exercise, or recreation |
| 1302 | Attending sporting/recreational events |
| **Other childcare** | |
| 030108 | Organization and planning for household children |
| 030110 | Attending household children's events |
| 030111 | Waiting for/with household children |
| 030112 | Picking up/dropping off household children |
| 030199 | Caring for and helping household children, not elsewhere classified |
| 030202 | Meetings and school conferences (household children) |
| 030204 | Waiting associated with household children's education |
| 030299 | Activities related to household children's education, not elsewhere classified |
| 030302 | Obtaining medical care for household children |
| 030303 | Waiting associated with household children's health |
| 030399 | Activities related to household children's health, not elsewhere classified |
| 170301 | Travel related to caring for and helping household children (2003 and 2004) |
| 180301 | Travel related to caring for and helping household children |
| 180302 | Travel related to household children's education |
| 180303 | Travel related to household children's health |

Note: These categorizations are used by Stewart (2010) A child must be present during enriching care activities. For children ages 2+, enriching child care includes leisure activities during which the child was present (see text for further details).

Table A.5: Working Hours Gap Relative to Fathers with a Non-working Spouse

| | Weekday | Weekend | Weekday | | | |
|---|---|---|---|---|---|---|
| Fathers with Part-time Spouse | -0.121 | -0.0290 | -0.104 | -0.163 | -0.185 | -0.247* |
| | (0.116) | (0.121) | (0.116) | (0.117) | (0.115) | (0.144) |
| Fathers with Full-time Spouse | -0.253** | 0.00497 | -0.249** | -0.269** | -0.245** | -0.160 |
| | (0.0928) | (0.0967) | (0.0926) | (0.0945) | (0.0927) | (0.114) |
| Observations | 7769 | 7784 | 7769 | 7769 | 7769 | 4766 |
| Day of Week and Year | | | x | x | x | x |
| Education, Age and Race | | | | x | x | x |
| Usual Weekly Hours | | | | | x | x |
| Usual Weekly Hours less than 50 | | | | | | x |
| Average Hours, Fathers with Non-working Spouse | 8.040 | 2.164 | | | | |
| Average Hours, Fathers with Part-time Spouse | 7.919 | 2.135 | | | | |
| Average Hours, Fathers with Full-time Spouse | 7.788 | 2.169 | | | | |

Notes: Data are from the 2003-2014 American Time Use Surveys (ATUS). The table is based on 18-65 year old ATUS male respondents who report working full-time in the activity summary file. We keep those who are married with spouse present and have at least one own child in the household. The dependent variable is total hours spent on "work and work-related activities" on the diary day. Each column reports the coefficient on the "part-time spouse" dummy and the "full-time spouse" dummy with the omitted group being "non-working spouse". Column (5) controls for usual weekly hours worked reported in the activity summary file. Column (6) only includes workers who reported usual weekly hours of less than 50. Individual observations are weighted by ATUS weights for multi-year data files.

Table A.6: Household Care Hours Gap Relative to Fathers with a Non-working Spouse

| | Weekday | Weekend | Weekday | | | |
|---|---|---|---|---|---|---|
| Fathers with Part-time Spouse | 0.0702 | 0.0642 | 0.0739* | 0.0885** | 0.0925** | 0.0650 |
| | (0.0429) | (0.0551) | (0.0429) | (0.0424) | (0.0422) | (0.0594) |
| Fathers with Full-time Spouse | 0.0715** | -0.103** | 0.0707** | 0.112*** | 0.108** | 0.115** |
| | (0.0342) | (0.0439) | (0.0342) | (0.0341) | (0.0339) | (0.0469) |
| Observations | 7769 | 7784 | 7769 | 7769 | 7769 | 4766 |
| Day of Week and Year | | | x | x | x | x |
| Education, Age and Race | | | | x | x | x |
| Usual Weekly Hours | | | | | x | x |
| Usual Weekly Hours less than 50 | | | | | | x |
| Average Hours, Fathers with Non-working Spouse | 0.776 | 1.036 | | | | |
| Average Hours, Fathers with Part-time Spouse | 0.846 | 1.101 | | | | |
| Average Hours, Fathers with Full-time Spouse | 0.847 | 0.934 | | | | |

Notes: Data are from the 2003-2014 American Time Use Surveys (ATUS). The table is based on 18-65 years old ATUS male respondents who report working full-time in the activity summary file. We keep those who are married with spouse present and have at least one own child in the household. The dependent variable is total hours spent on "caring for and helping household members" on the diary day. Each column reports the coefficient on the "part-time spouse" dummy and the "full-time spouse" dummy with the omitted group being "non-working spouse". Column (5) controls for usual weekly hours worked reported in the activity summary file. Column (6) only includes workers who reported usual weekly hours of less than 50. Individual observations are weighted by ATUS weights for multi-year data files.

# Table A.7: Ratio8to5 by Occupation

| | Occupations | # FT Workers | ratio8to5 | ratio8to5_Std | % Females |
|---|---|---|---|---|---|
| 1 | Tank Car, Truck, and Ship Loaders | 5 | 0.000 | -4.979 | 0.000 |
| 2 | Miscellaneous Mathematical Science Occupations | 2 | 0.000 | -4.979 | 0.000 |
| 3 | Media and Communication Equipment Workers, All Other | 1 | 0.000 | -4.979 | 1.000 |
| 4 | Textile Bleaching and Dyeing Machine Operators and Tenders | 2 | 0.092 | -4.360 | 0.370 |
| 5 | Food Preparation and Serving Related Workers, All Other | 2 | 0.160 | -3.898 | 0.523 |
| 6 | Postal Service Mail Sorters, Processors, and Processing Machine Operators | 55 | 0.243 | -3.336 | 0.474 |
| 7 | Fishers and Related Fishing Workers | 7 | 0.304 | -2.927 | 0.087 |
| 8 | Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic | 11 | 0.319 | -2.823 | 0.000 |
| 9 | Electrical and Electronics Repairers, Industrial and Utility | 8 | 0.328 | -2.765 | 0.000 |
| 10 | Locomotive Engineers and Operators | 25 | 0.340 | -2.685 | 0.012 |
| 11 | Railroad Brake, Signal, and Switch Operators | 7 | 0.340 | -2.680 | 0.000 |
| 12 | Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic | 7 | 0.384 | -2.386 | 0.000 |
| 13 | Bartenders | 83 | 0.401 | -2.271 | 0.573 |
| 14 | Derrick, Rotary Drill, and Service Unit Operators, Oil, Gas, and Mining | 17 | 0.404 | -2.247 | 0.000 |
| 15 | Ushers, Lobby Attendants, and Ticket Takers | 2 | 0.423 | -2.121 | 0.504 |
| 16 | Metal Furnace and Kiln Operators and Tenders | 12 | 0.431 | -2.065 | 0.000 |
| 17 | Motion Picture Projectionists | 1 | 0.432 | -2.063 | 0.000 |
| 18 | Door-to-Door Sales Workers, News and Street Vendors, and Related Workers | 39 | 0.437 | -2.026 | 0.778 |
| 19 | Paper Goods Machine Setters, Operators, and Tenders | 27 | 0.438 | -2.019 | 0.326 |
| 20 | Gaming Services Workers | 37 | 0.455 | -1.906 | 0.596 |
| 21 | Respiratory Therapists | 72 | 0.467 | -1.825 | 0.496 |
| 22 | Shoe and Leather Workers and Repairers | 4 | 0.468 | -1.816 | 0.000 |
| 23 | Material Moving Workers, All Other | 17 | 0.473 | -1.786 | 0.059 |
| 24 | Residential Advisors | 21 | 0.473 | -1.785 | 0.774 |
| 25 | Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders | 8 | 0.478 | -1.749 | 0.279 |
| 26 | Tool Grinders, Filers, and Sharpeners | 9 | 0.481 | -1.727 | 0.000 |
| 27 | Emergency Medical Technicians and Paramedics | 72 | 0.484 | -1.709 | 0.221 |
| 28 | Bailiffs, Correctional Officers, and Jailers | 245 | 0.484 | -1.706 | 0.209 |
| 29 | Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic | 67 | 0.492 | -1.656 | 0.197 |
| 30 | Service Station Attendants | 31 | 0.493 | -1.651 | 0.165 |
| 31 | Fire Fighters | 160 | 0.494 | -1.641 | 0.038 |
| 32 | Musicians, Singers, and Related Workers | 52 | 0.505 | -1.565 | 0.225 |
| 33 | Manufactured Building and Mobile Home Installers | 5 | 0.511 | -1.526 | 0.293 |
| 34 | Molders and Molding Machine Setters, Operators, and Tenders, Metal and Plastic | 30 | 0.517 | -1.484 | 0.266 |
| 35 | Agricultural and Food Science Technicians | 15 | 0.518 | -1.480 | 0.357 |
| 36 | Mining Machine Operators | 27 | 0.518 | -1.478 | 0.015 |
| 37 | Maintenance Workers, Machinery | 29 | 0.519 | -1.471 | 0.019 |
| 38 | Helpers–Extraction Workers | 7 | 0.520 | -1.469 | 0.000 |
| 39 | Electronic Equipment Installers and Repairers, Motor Vehicles | 17 | 0.524 | -1.437 | 0.000 |
| 40 | Hotel, Motel, and Resort Desk Clerks | 38 | 0.530 | -1.398 | 0.776 |
| 41 | Logging Workers | 28 | 0.533 | -1.381 | 0.000 |
| 42 | Security Guards and Gaming Surveillance Officers | 350 | 0.533 | -1.378 | 0.181 |
| 43 | Bridge and Lock Tenders | 2 | 0.533 | -1.377 | 0.404 |
| 44 | Dispatchers | 129 | 0.536 | -1.357 | 0.403 |
| 45 | Police and Sheriff's Patrol Officers | 392 | 0.536 | -1.356 | 0.111 |
| 46 | Communications Equipment Operators, All Other | 6 | 0.539 | -1.339 | 0.755 |
| 47 | Lay-Out Workers, Metal and Plastic | 4 | 0.540 | -1.333 | 0.000 |
| 48 | Postal Service Clerks | 94 | 0.540 | -1.331 | 0.422 |
| 49 | Miscellaneous Plant and System Operators | 18 | 0.540 | -1.328 | 0.196 |

Continued on next page

| | Occupations | # FT Workers | ratio8to5 | ratio8to5_Std | % Females |
|---|---|---|---|---|---|
| 50 | Supervisors, Protective Service Workers, All Other | 49 | 0.542 | -1.314 | 0.185 |
| 51 | Stationary Engineers and Boiler Operators | 63 | 0.546 | -1.292 | 0.062 |
| 52 | Nursing, Psychiatric, and Home Health Aides | 810 | 0.547 | -1.284 | 0.881 |
| 53 | Crushing, Grinding, Polishing, Mixing, and Blending Workers | 48 | 0.549 | -1.270 | 0.046 |
| 54 | Taxi Drivers and Chauffeurs | 122 | 0.552 | -1.252 | 0.193 |
| 55 | First-Line Supervisors/Managers of Fire Fighting and Prevention Workers | 37 | 0.558 | -1.210 | 0.038 |
| 56 | Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders | 5 | 0.559 | -1.204 | 0.267 |
| 57 | Personal and Home Care Aides | 264 | 0.560 | -1.197 | 0.819 |
| 58 | Dining Room and Cafeteria Attendants and Bartender Helpers | 55 | 0.560 | -1.194 | 0.504 |
| 59 | Forging Machine Setters, Operators, and Tenders, Metal and Plastic | 4 | 0.566 | -1.158 | 0.000 |
| 60 | Statistical Assistants | 14 | 0.567 | -1.151 | 0.555 |
| 61 | Waiters and Waitresses | 282 | 0.568 | -1.141 | 0.734 |
| 62 | Chemical Technicians | 41 | 0.568 | -1.140 | 0.172 |
| 63 | Bakers | 63 | 0.571 | -1.121 | 0.465 |
| 64 | Food Cooking Machine Operators and Tenders | 18 | 0.571 | -1.120 | 0.448 |
| 65 | Dishwashers | 55 | 0.575 | -1.093 | 0.265 |
| 66 | Tire Builders | 14 | 0.580 | -1.060 | 0.100 |
| 67 | Baggage Porters, Bellhops, and Concierges | 32 | 0.582 | -1.049 | 0.098 |
| 68 | Packaging and Filling Machine Operators and Tenders | 141 | 0.582 | -1.043 | 0.473 |
| 69 | First-Line Supervisors/Managers of Police and Detectives | 85 | 0.585 | -1.027 | 0.226 |
| 70 | Food Servers, Nonrestaurant | 48 | 0.587 | -1.012 | 0.512 |
| 71 | Metal Workers and Plastic Workers, All Other | 226 | 0.587 | -1.011 | 0.187 |
| 72 | Boilermakers | 11 | 0.587 | -1.010 | 0.000 |
| 73 | Biological Technicians | 14 | 0.591 | -0.989 | 0.399 |
| 74 | Ship and Boat Captains and Operators | 11 | 0.592 | -0.980 | 0.070 |
| 75 | Industrial Truck and Tractor Operators | 290 | 0.594 | -0.965 | 0.045 |
| 76 | Production Workers, All Other | 471 | 0.596 | -0.949 | 0.388 |
| 77 | First-Line Supervisors/Managers of Food Preparation and Serving Workers | 241 | 0.597 | -0.947 | 0.642 |
| 78 | Stock Clerks and Order Fillers | 489 | 0.598 | -0.942 | 0.445 |
| 79 | Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop | 17 | 0.598 | -0.936 | 0.945 |
| 80 | Machine Feeders and Offbearers | 21 | 0.599 | -0.933 | 0.420 |
| 81 | Air Traffic Controllers and Airfield Operations Specialists | 29 | 0.599 | -0.929 | 0.241 |
| 82 | Food Service Managers | 417 | 0.600 | -0.928 | 0.432 |
| 83 | Gaming Cage Workers | 7 | 0.600 | -0.925 | 0.879 |
| 84 | Aircraft Mechanics and Service Technicians | 71 | 0.600 | -0.922 | 0.020 |
| 85 | Printing Machine Operators | 93 | 0.606 | -0.883 | 0.134 |
| 86 | Railroad Conductors and Yardmasters | 29 | 0.607 | -0.875 | 0.030 |
| 87 | Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic | 2 | 0.611 | -0.853 | 0.000 |
| 88 | Counter Attendants, Cafeteria, Food Concession, and Coffee Shop | 26 | 0.612 | -0.842 | 0.676 |
| 89 | Aircraft Structure, Surfaces, Rigging, and Systems Assemblers | 10 | 0.613 | -0.839 | 0.453 |
| 90 | Motor Vehicle Operators, All Other | 12 | 0.616 | -0.815 | 0.222 |
| 91 | Engine and Other Machine Assemblers | 13 | 0.618 | -0.807 | 0.119 |
| 92 | Helpers, Construction Trades | 32 | 0.619 | -0.795 | 0.029 |
| 93 | Cashiers | 566 | 0.621 | -0.781 | 0.778 |
| 94 | Electrical, Electronics, and Electromechanical Assemblers | 90 | 0.622 | -0.775 | 0.515 |
| 95 | Machinists | 200 | 0.622 | -0.774 | 0.059 |
| 96 | Miscellaneous Entertainment Attendants and Related Workers | 33 | 0.623 | -0.770 | 0.516 |
| 97 | Coin, Vending, and Amusement Machine Servicers and Repairers | 26 | 0.623 | -0.770 | 0.203 |
| 98 | Janitors and Building Cleaners | 821 | 0.624 | -0.761 | 0.275 |
| 99 | Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic | 2 | 0.625 | -0.756 | 0.000 |
| 100 | Cooks | 524 | 0.627 | -0.743 | 0.403 |

Continued on next page

| | Occupations | # FT Workers | ratio8to5 | ratio8to5_Std | % Females |
|---|---|---|---|---|---|
| 101 | Telemarketers | 35 | 0.627 | -0.742 | 0.642 |
| 102 | Parking Lot Attendants | 24 | 0.629 | -0.728 | 0.032 |
| 103 | Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic | 12 | 0.630 | -0.725 | 0.081 |
| 104 | Telephone Operators | 27 | 0.630 | -0.724 | 0.655 |
| 105 | First-line Supervisors/Managers of Gaming Workers | 64 | 0.630 | -0.723 | 0.297 |
| 106 | Registered Nurses | 1369 | 0.633 | -0.701 | 0.912 |
| 107 | Health Diagnosing and Treating Practitioners, All Other | 3 | 0.634 | -0.694 | 0.596 |
| 108 | Laborers and Freight, Stock, and Material Movers, Hand | 641 | 0.634 | -0.693 | 0.166 |
| 109 | Miscellaneous Assemblers and Fabricators | 462 | 0.635 | -0.691 | 0.371 |
| 110 | Prepress Technicians and Workers | 20 | 0.637 | -0.677 | 0.607 |
| 111 | Transportation Attendants | 26 | 0.637 | -0.674 | 0.529 |
| 112 | Structural Iron and Steel Workers | 34 | 0.639 | -0.663 | 0.000 |
| 113 | Reservation and Transportation Ticket Agents and Travel Clerks | 55 | 0.639 | -0.663 | 0.600 |
| 114 | Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic | 22 | 0.641 | -0.650 | 0.304 |
| 115 | Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders | 17 | 0.642 | -0.639 | 0.146 |
| 116 | Chemical Processing Machine Setters, Operators, and Tenders | 34 | 0.645 | -0.621 | 0.181 |
| 117 | Cutting Workers | 49 | 0.645 | -0.620 | 0.241 |
| 118 | First-Line Supervisors/Managers of Production and Operating Workers | 499 | 0.650 | -0.590 | 0.194 |
| 119 | Cooling and Freezing Equipment Operators and Tenders | 2 | 0.650 | -0.587 | 0.000 |
| 120 | Textile, Apparel, and Furnishings Workers, All Other | 12 | 0.651 | -0.583 | 0.461 |
| 121 | Farmers and Ranchers | 217 | 0.653 | -0.566 | 0.328 |
| 122 | Cleaners of Vehicles and Equipment | 118 | 0.654 | -0.564 | 0.165 |
| 123 | Packers and Packagers, Hand | 184 | 0.655 | -0.556 | 0.505 |
| 124 | Office Machine Operators, Except Computer | 18 | 0.657 | -0.542 | 0.627 |
| 125 | Industrial and Refractory Machinery Mechanics | 262 | 0.657 | -0.542 | 0.025 |
| 126 | Laundry and Dry-Cleaning Workers | 81 | 0.657 | -0.542 | 0.609 |
| 127 | Food Batchmakers | 44 | 0.658 | -0.531 | 0.593 |
| 128 | Bus Drivers | 181 | 0.662 | -0.505 | 0.569 |
| 129 | Tool and Die Makers | 49 | 0.663 | -0.501 | 0.012 |
| 130 | Photographers | 57 | 0.664 | -0.493 | 0.401 |
| 131 | Signal and Track Switch Repairers | 3 | 0.668 | -0.463 | 0.000 |
| 132 | Graders and Sorters, Agricultural Products | 49 | 0.670 | -0.450 | 0.677 |
| 133 | Driver/Sales Workers and Truck Drivers | 1420 | 0.672 | -0.436 | 0.060 |
| 134 | Inspectors, Testers, Sorters, Samplers, and Weighers | 382 | 0.673 | -0.434 | 0.395 |
| 135 | Miscellaneous Agricultural Workers | 340 | 0.673 | -0.429 | 0.194 |
| 136 | Clinical Laboratory Technologists and Technicians | 183 | 0.674 | -0.426 | 0.729 |
| 137 | Refuse and Recyclable Material Collectors | 36 | 0.674 | -0.425 | 0.043 |
| 138 | Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders | 11 | 0.678 | -0.395 | 0.421 |
| 139 | Licensed Practical and Licensed Vocational Nurses | 252 | 0.682 | -0.374 | 0.911 |
| 140 | Chefs and Head Cooks | 115 | 0.682 | -0.370 | 0.194 |
| 141 | Animal Breeders | 1 | 0.684 | -0.356 | 0.000 |
| 142 | Lodging Managers | 75 | 0.685 | -0.351 | 0.534 |
| 143 | Food Preparation Workers | 161 | 0.686 | -0.345 | 0.600 |
| 144 | Shipping, Receiving, and Traffic Clerks | 267 | 0.686 | -0.341 | 0.305 |
| 145 | Other Life, Physical, and Social Science Technicians | 56 | 0.688 | -0.332 | 0.555 |
| 146 | Other Extraction Workers | 22 | 0.688 | -0.328 | 0.014 |
| 147 | Clergy | 231 | 0.690 | -0.317 | 0.189 |
| 148 | Crane and Tower Operators | 21 | 0.690 | -0.316 | 0.064 |
| 149 | Crossing Guards | 15 | 0.693 | -0.299 | 0.521 |
| 150 | Pile-Driver Operators | 1 | 0.694 | -0.291 | 0.000 |
| 151 | Supervisors, Transportation and Material Moving Workers | 121 | 0.694 | -0.288 | 0.206 |

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| | Occupations | # FT Workers | ratio8to5 | ratio8to5_Std | % Females |
|---|---|---|---|---|---|
| 152 | Weighers, Measurers, Checkers, and Samplers, Recordkeeping | 43 | 0.694 | -0.287 | 0.398 |
| 153 | Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic | 4 | 0.695 | -0.284 | 0.000 |
| 154 | Farm, Ranch, and Other Agricultural Managers | 163 | 0.696 | -0.279 | 0.173 |
| 155 | Optometrists | 15 | 0.698 | -0.263 | 0.306 |
| 156 | Couriers and Messengers | 94 | 0.700 | -0.252 | 0.153 |
| 157 | Petroleum Engineers | 14 | 0.700 | -0.247 | 0.107 |
| 158 | Transportation Inspectors | 18 | 0.701 | -0.245 | 0.227 |
| 159 | Bus and Truck Mechanics and Diesel Engine Specialists | 174 | 0.701 | -0.243 | 0.004 |
| 160 | Rolling Machine Setters, Operators, and Tenders, Metal and Plastic | 10 | 0.701 | -0.243 | 0.129 |
| 161 | Religious Workers, All Other | 37 | 0.703 | -0.232 | 0.683 |
| 162 | Gaming Managers | 16 | 0.704 | -0.225 | 0.219 |
| 163 | Podiatrists | 6 | 0.704 | -0.221 | 0.000 |
| 164 | Agricultural Inspectors | 9 | 0.705 | -0.214 | 0.318 |
| 165 | First-Line Supervisors/Managers of Correctional Officers | 24 | 0.707 | -0.204 | 0.309 |
| 166 | Broadcast and Sound Engineering Technicians and Radio Operators | 37 | 0.708 | -0.198 | 0.093 |
| 167 | Announcers | 22 | 0.708 | -0.195 | 0.380 |
| 168 | First-Line Supervisors/Managers of Housekeeping and Janitorial Workers | 123 | 0.708 | -0.193 | 0.443 |
| 169 | Heavy Vehicle and Mobile Equipment Service Technicians and Mechanics | 117 | 0.709 | -0.189 | 0.008 |
| 170 | Jewelers and Precious Stone and Metal Workers | 20 | 0.709 | -0.188 | 0.514 |
| 171 | Geological and Petroleum Technicians | 11 | 0.709 | -0.186 | 0.381 |
| 172 | Recreation and Fitness Workers | 101 | 0.710 | -0.184 | 0.675 |
| 173 | Marine Engineers and Naval Architects | 6 | 0.711 | -0.173 | 0.000 |
| 174 | Helpers–Production Workers | 23 | 0.711 | -0.172 | 0.266 |
| 175 | Aircraft Pilots and Flight Engineers | 51 | 0.713 | -0.161 | 0.035 |
| 176 | Avionics Technicians | 8 | 0.713 | -0.161 | 0.063 |
| 177 | Combined Food Preparation and Serving Workers, Including Fast Food | 60 | 0.714 | -0.152 | 0.639 |
| 178 | Entertainers and Performers, Sports and Related Workers, All Other | 9 | 0.715 | -0.151 | 0.507 |
| 179 | Ambulance Drivers and Attendants, Except Emergency Medical Technicians | 4 | 0.719 | -0.124 | 0.000 |
| 180 | Personal Care and Service Workers, All Other | 27 | 0.720 | -0.116 | 0.524 |
| 181 | Millwrights | 34 | 0.720 | -0.112 | 0.007 |
| 182 | Dancers and Choreographers | 5 | 0.720 | -0.112 | 0.667 |
| 183 | Power Plant Operators, Distributors, and Dispatchers | 24 | 0.724 | -0.088 | 0.066 |
| 184 | Butchers and Other Meat, Poultry, and Fish Processing Workers | 123 | 0.725 | -0.081 | 0.253 |
| 185 | Sawing Machine Setters, Operators, and Tenders, Wood | 20 | 0.725 | -0.079 | 0.020 |
| 186 | Water and Liquid Waste Treatment Plant and System Operators | 52 | 0.728 | -0.058 | 0.094 |
| 187 | Woodworking Machine Setters, Operators, and Tenders, Except Sawing | 21 | 0.729 | -0.057 | 0.376 |
| 188 | Materials Engineers | 24 | 0.730 | -0.046 | 0.106 |
| 189 | Massage Therapists | 25 | 0.730 | -0.046 | 0.883 |
| 190 | Textile Knitting and Weaving Machine Setters, Operators, and Tenders | 4 | 0.731 | -0.038 | 0.503 |
| 191 | Septic Tank Servicers and Sewer Pipe Cleaners | 6 | 0.732 | -0.034 | 0.000 |
| 192 | Animal Trainers | 16 | 0.733 | -0.029 | 0.469 |
| 193 | Explosives Workers, Ordnance Handling Experts, and Blasters | 3 | 0.733 | -0.025 | 0.000 |
| 194 | Operating Engineers and Other Construction Equipment Operators | 217 | 0.734 | -0.023 | 0.025 |
| 195 | Computer Operators | 85 | 0.734 | -0.018 | 0.411 |
| 196 | Painting Workers | 87 | 0.734 | -0.016 | 0.107 |
| 197 | Physicians and Surgeons | 503 | 0.735 | -0.010 | 0.313 |
| 198 | Tailors, Dressmakers, and Sewers | 34 | 0.736 | -0.008 | 0.871 |
| 199 | Biomedical Engineers | 7 | 0.736 | -0.005 | 0.000 |
| 200 | Other Transportation Workers | 5 | 0.736 | -0.003 | 0.040 |
| 201 | Editors | 105 | 0.737 | -0.001 | 0.549 |
| 202 | Paving, Surfacing, and Tamping Equipment Operators | 10 | 0.737 | 0.004 | 0.000 |

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| | Occupations | # FT Workers | ratio8to5 | ratio8to5_Std | % Females |
|---|---|---|---|---|---|
| 203 | Nuclear Engineers | 7 | 0.739 | 0.011 | 0.000 |
| 204 | Sheet Metal Workers | 73 | 0.739 | 0.012 | 0.029 |
| 205 | Television, Video, and Motion Picture Camera Operators and Editors | 17 | 0.739 | 0.016 | 0.032 |
| 206 | First-Line Supervisors/Managers of Retail Sales Workers | 1575 | 0.740 | 0.018 | 0.409 |
| 207 | First-Line Supervisors/Managers of Farming, Fishing, and Forestry Workers | 31 | 0.741 | 0.029 | 0.076 |
| 208 | Pumping Station Operators | 12 | 0.744 | 0.047 | 0.000 |
| 209 | Molders, Shapers, and Casters, Except Metal and Plastic | 14 | 0.744 | 0.049 | 0.401 |
| 210 | Structural Metal Fabricators and Fitters | 7 | 0.745 | 0.052 | 0.000 |
| 211 | Health Diagnosing and Treating Practitioner Support Technicians | 204 | 0.746 | 0.062 | 0.798 |
| 212 | Counter and Rental Clerks | 45 | 0.749 | 0.079 | 0.366 |
| 213 | Producers and Directors | 89 | 0.749 | 0.085 | 0.341 |
| 214 | Electrical Power-Line Installers and Repairers | 74 | 0.750 | 0.086 | 0.008 |
| 215 | Computer Control Programmers and Operators | 33 | 0.751 | 0.098 | 0.009 |
| 216 | Welding, Soldering, and Brazing Workers | 276 | 0.752 | 0.103 | 0.028 |
| 217 | Cementing and Gluing Machine Operators and Tenders | 7 | 0.755 | 0.119 | 0.532 |
| 218 | Athletes, Coaches, Umpires, and Related Workers | 72 | 0.756 | 0.131 | 0.457 |
| 219 | Diagnostic Related Technologists and Technicians | 144 | 0.759 | 0.147 | 0.735 |
| 220 | Computer Support Specialists | 229 | 0.759 | 0.150 | 0.242 |
| 221 | Writers and Authors | 82 | 0.760 | 0.157 | 0.526 |
| 222 | Semiconductor Processors | 2 | 0.760 | 0.158 | 0.318 |
| 223 | News Analysts, Reporters and Correspondents | 58 | 0.760 | 0.159 | 0.454 |
| 224 | Hazardous Materials Removal Workers | 11 | 0.761 | 0.164 | 0.233 |
| 225 | Other Teachers and Instructors | 238 | 0.762 | 0.167 | 0.623 |
| 226 | Administrative Services Managers | 64 | 0.762 | 0.168 | 0.351 |
| 227 | Artists and Related Workers | 68 | 0.765 | 0.189 | 0.545 |
| 228 | Postsecondary Teachers | 669 | 0.765 | 0.190 | 0.458 |
| 229 | Conveyor Operators and Tenders | 4 | 0.766 | 0.197 | 0.050 |
| 230 | Sales Engineers | 29 | 0.767 | 0.205 | 0.134 |
| 231 | Dredge, Excavating, and Loading Machine Operators | 31 | 0.767 | 0.206 | 0.004 |
| 232 | Maids and Housekeeping Cleaners | 435 | 0.767 | 0.206 | 0.914 |
| 233 | Electric Motor, Power Tool, and Related Repairers | 26 | 0.768 | 0.209 | 0.082 |
| 234 | Pharmacists | 110 | 0.768 | 0.210 | 0.469 |
| 235 | Highway Maintenance Workers | 67 | 0.768 | 0.210 | 0.005 |
| 236 | Logisticians | 38 | 0.768 | 0.212 | 0.322 |
| 237 | Switchboard Operators, Including Answering Service | 13 | 0.768 | 0.213 | 0.676 |
| 238 | First-Line Supervisors/Managers of Landscaping, Lawn Service, and Groundskeeping Workers | 124 | 0.769 | 0.219 | 0.041 |
| 239 | Retail Salespersons | 831 | 0.774 | 0.253 | 0.514 |
| 240 | Order Clerks | 58 | 0.775 | 0.260 | 0.583 |
| 241 | Roofers | 60 | 0.776 | 0.261 | 0.012 |
| 242 | Commercial Divers | 3 | 0.777 | 0.271 | 0.000 |
| 243 | Directors, Religious Activities and Education | 36 | 0.777 | 0.271 | 0.485 |
| 244 | First-Line Supervisors/Managers of Construction Trades and Extraction Workers | 421 | 0.777 | 0.272 | 0.039 |
| 245 | Secondary School Teachers | 728 | 0.778 | 0.277 | 0.573 |
| 246 | Cabinetmakers and Bench Carpenters | 36 | 0.779 | 0.282 | 0.043 |
| 247 | Engineering Technicians, Except Drafters | 232 | 0.780 | 0.288 | 0.181 |
| 248 | Tax Preparers | 30 | 0.781 | 0.295 | 0.618 |
| 249 | General and Operations Managers | 604 | 0.781 | 0.298 | 0.328 |
| 250 | First-Line Supervisors/Managers of Mechanics, Installers, and Repairers | 212 | 0.782 | 0.304 | 0.065 |
| 251 | Animal Control Workers | 6 | 0.783 | 0.314 | 0.375 |
| 252 | Aerospace Engineers | 55 | 0.784 | 0.318 | 0.202 |
| 253 | Sales Representatives, Services, All Other | 265 | 0.785 | 0.322 | 0.320 |

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| | Occupations | # FT Workers | ratio8to5 | ratio8to5_Std | % Females |
|---|---|---|---|---|---|
| 254 | Industrial Production Managers | 181 | 0.785 | 0.323 | 0.153 |
| 255 | Construction Managers | 464 | 0.786 | 0.332 | 0.046 |
| 256 | Riggers | 5 | 0.787 | 0.338 | 0.000 |
| 257 | Child Care Workers | 446 | 0.787 | 0.338 | 0.940 |
| 258 | Chiropractors | 30 | 0.789 | 0.354 | 0.264 |
| 259 | Other Installation, Maintenance, and Repair Workers | 86 | 0.790 | 0.357 | 0.067 |
| 260 | Sailors and Marine Oilers | 6 | 0.790 | 0.359 | 0.266 |
| 261 | Conservation Scientists and Foresters | 15 | 0.791 | 0.365 | 0.256 |
| 262 | First-Line Supervisors/Managers of Office and Administrative Support Workers | 905 | 0.791 | 0.367 | 0.682 |
| 263 | Miscellaneous Health Technologists and Technicians | 59 | 0.792 | 0.370 | 0.620 |
| 264 | Chief Executives | 922 | 0.792 | 0.373 | 0.287 |
| 265 | Real Estate Brokers and Sales Agents | 361 | 0.793 | 0.378 | 0.584 |
| 266 | Construction Laborers | 434 | 0.793 | 0.378 | 0.040 |
| 267 | First-Line Supervisors/Managers of Non-Retail Sales Workers | 681 | 0.793 | 0.382 | 0.274 |
| 268 | Sewing Machine Operators | 102 | 0.794 | 0.384 | 0.717 |
| 269 | Nonfarm Animal Caretakers | 60 | 0.794 | 0.389 | 0.734 |
| 270 | Managers, All Other | 2083 | 0.795 | 0.391 | 0.346 |
| 271 | Shoe Machine Operators and Tenders | 1 | 0.795 | 0.392 | 1.000 |
| 272 | Computer Scientists and Systems Analysts | 462 | 0.796 | 0.396 | 0.270 |
| 273 | Mail Clerks and Mail Machine Operators, Except Postal Service | 52 | 0.796 | 0.396 | 0.477 |
| 274 | Electricians | 420 | 0.796 | 0.398 | 0.015 |
| 275 | Payroll and Timekeeping Clerks | 103 | 0.797 | 0.406 | 0.898 |
| 276 | Transportation, Storage, and Distribution Managers | 157 | 0.798 | 0.410 | 0.170 |
| 277 | Physician Assistants | 46 | 0.798 | 0.411 | 0.774 |
| 278 | Miscellaneous Personal Appearance Workers | 57 | 0.799 | 0.421 | 0.935 |
| 279 | Database Administrators | 69 | 0.799 | 0.422 | 0.358 |
| 280 | Architects, Except Naval | 118 | 0.800 | 0.426 | 0.241 |
| 281 | Roustabouts, Oil and Gas | 2 | 0.800 | 0.426 | 0.000 |
| 282 | Tax Examiners, Collectors, and Revenue Agents | 44 | 0.801 | 0.434 | 0.387 |
| 283 | Maintenance and Repair Workers, General | 203 | 0.802 | 0.437 | 0.040 |
| 284 | Agents and Business Managers of Artists, Performers, and Athletes | 20 | 0.803 | 0.446 | 0.233 |
| 285 | Fish and Game Wardens | 2 | 0.803 | 0.448 | 0.000 |
| 286 | Opticians, Dispensing | 21 | 0.803 | 0.450 | 0.513 |
| 287 | Interviewers, Except Eligibility and Loan | 54 | 0.804 | 0.456 | 0.751 |
| 288 | Upholsterers | 21 | 0.805 | 0.459 | 0.009 |
| 289 | First-Line Supervisors/Managers of Personal Service Workers | 70 | 0.806 | 0.464 | 0.669 |
| 290 | Special Education Teachers | 233 | 0.806 | 0.467 | 0.874 |
| 291 | Detectives and Criminal Investigators | 92 | 0.806 | 0.469 | 0.119 |
| 292 | Network Systems and Data Communications Analysts | 227 | 0.806 | 0.470 | 0.229 |
| 293 | Dentists | 68 | 0.806 | 0.470 | 0.247 |
| 294 | Engineering Managers | 66 | 0.807 | 0.473 | 0.081 |
| 295 | Customer Service Representatives | 888 | 0.807 | 0.475 | 0.650 |
| 296 | Engineers, All Other | 214 | 0.807 | 0.475 | 0.131 |
| 297 | Cement Masons, Concrete Finishers, and Terrazzo Workers | 40 | 0.807 | 0.476 | 0.008 |
| 298 | Appraisers and Assessors of Real Estate | 53 | 0.808 | 0.478 | 0.385 |
| 299 | Job Printers | 18 | 0.808 | 0.483 | 0.053 |
| 300 | Management Analysts | 394 | 0.809 | 0.484 | 0.398 |
| 301 | Public Relations Managers | 41 | 0.809 | 0.486 | 0.556 |
| 302 | Miscellaneous Media and Communication Workers | 28 | 0.809 | 0.488 | 0.673 |
| 303 | Grounds Maintenance Workers | 404 | 0.809 | 0.490 | 0.057 |
| 304 | Medical Records and Health Information Technicians | 60 | 0.810 | 0.493 | 0.770 |

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| | Occupations | # FT Workers | ratio8to5 | ratio8to5_Std | % Females |
|---|---|---|---|---|---|
| 305 | Model Makers and Patternmakers, Wood | 1 | 0.811 | 0.499 | 1.000 |
| 306 | Telecommunications Line Installers and Repairers | 112 | 0.812 | 0.505 | 0.029 |
| 307 | Insulation Workers | 15 | 0.812 | 0.506 | 0.022 |
| 308 | Pressers, Textile, Garment, and Related Materials | 16 | 0.812 | 0.509 | 0.783 |
| 309 | Heating, Air Conditioning, and Refrigeration Mechanics and Installers | 198 | 0.813 | 0.512 | 0.011 |
| 310 | Education Administrators | 541 | 0.813 | 0.516 | 0.621 |
| 311 | Fire Inspectors | 13 | 0.813 | 0.517 | 0.012 |
| 312 | Chemists and Materials Scientists | 78 | 0.813 | 0.517 | 0.346 |
| 313 | Construction and Building Inspectors | 62 | 0.814 | 0.519 | 0.167 |
| 314 | Social and Community Service Managers | 220 | 0.814 | 0.519 | 0.619 |
| 315 | Earth Drillers, Except Oil and Gas | 8 | 0.814 | 0.523 | 0.000 |
| 316 | Human Resources Managers | 201 | 0.815 | 0.527 | 0.644 |
| 317 | Counselors | 377 | 0.815 | 0.527 | 0.710 |
| 318 | Procurement Clerks | 22 | 0.816 | 0.531 | 0.546 |
| 319 | Helpers–Installation, Maintenance, and Repair Workers | 10 | 0.817 | 0.539 | 0.118 |
| 320 | Civil Engineers | 203 | 0.817 | 0.540 | 0.123 |
| 321 | Designers | 369 | 0.817 | 0.540 | 0.546 |
| 322 | Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic | 5 | 0.817 | 0.542 | 0.281 |
| 323 | Environmental Engineers | 25 | 0.817 | 0.543 | 0.139 |
| 324 | Pipelayers, Plumbers, Pipefitters, and Steamfitters | 276 | 0.818 | 0.551 | 0.007 |
| 325 | Hairdressers, Hairstylists, and Cosmetologists | 221 | 0.819 | 0.552 | 0.916 |
| 326 | Sales Representatives, Wholesale and Manufacturing | 718 | 0.819 | 0.554 | 0.277 |
| 327 | Carpenters | 637 | 0.819 | 0.555 | 0.009 |
| 328 | Radio and Telecommunications Equipment Installers and Repairers | 105 | 0.819 | 0.556 | 0.073 |
| 329 | Medical Assistants and Other Healthcare Support Occupations | 315 | 0.820 | 0.561 | 0.859 |
| 330 | Private Detectives and Investigators | 39 | 0.820 | 0.563 | 0.508 |
| 331 | Wholesale and Retail Buyers, Except Farm Products | 96 | 0.820 | 0.564 | 0.569 |
| 332 | Bookbinders and Bindery Workers | 15 | 0.821 | 0.571 | 0.126 |
| 333 | Medical and Health Services Managers | 354 | 0.823 | 0.584 | 0.714 |
| 334 | Carpet, Floor, and Tile Installers and Finishers | 82 | 0.823 | 0.585 | 0.051 |
| 335 | Industrial Engineers, including Health and Safety | 137 | 0.824 | 0.585 | 0.245 |
| 336 | Environmental Scientists and Geoscientists | 63 | 0.824 | 0.586 | 0.195 |
| 337 | Lawyers | 657 | 0.824 | 0.588 | 0.345 |
| 338 | Atmospheric and Space Scientists | 8 | 0.825 | 0.593 | 0.158 |
| 339 | Office and Administrative Support Workers, All Other | 303 | 0.825 | 0.594 | 0.781 |
| 340 | Tellers | 156 | 0.825 | 0.595 | 0.879 |
| 341 | Drywall Installers, Ceiling Tile Installers, and Tapers | 76 | 0.825 | 0.596 | 0.006 |
| 342 | Data Entry Keyers | 230 | 0.825 | 0.598 | 0.799 |
| 343 | Medical, Dental, and Ophthalmic Laboratory Technicians | 43 | 0.826 | 0.600 | 0.399 |
| 344 | Automotive Service Technicians and Mechanics | 366 | 0.826 | 0.601 | 0.008 |
| 345 | Computer and Information Systems Managers | 351 | 0.826 | 0.601 | 0.240 |
| 346 | Parking Enforcement Workers | 2 | 0.827 | 0.606 | 0.434 |
| 347 | Urban and Regional Planners | 20 | 0.827 | 0.609 | 0.285 |
| 348 | Network and Computer Systems Administrators | 162 | 0.828 | 0.614 | 0.192 |
| 349 | Electrical and Electronics Engineers | 225 | 0.828 | 0.617 | 0.140 |
| 350 | Funeral Directors | 15 | 0.828 | 0.618 | 0.078 |
| 351 | Rail-Track Laying and Maintenance Equipment Operators | 5 | 0.829 | 0.620 | 0.000 |
| 352 | Human Resources Assistants, Except Payroll and Timekeeping | 37 | 0.829 | 0.622 | 0.849 |
| 353 | Elementary and Middle School Teachers | 1678 | 0.829 | 0.623 | 0.849 |
| 354 | Marketing and Sales Managers | 591 | 0.830 | 0.630 | 0.387 |
| 355 | Other Business Operations Specialists | 182 | 0.831 | 0.633 | 0.726 |

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| | Occupations | # FT Workers | ratio8to5 | ratio8to5_Std | % Females |
|---|---|---|---|---|---|
| 356 | Psychologists | 93 | 0.831 | 0.634 | 0.700 |
| 357 | Miscellaneous Social Scientists and Related Workers | 23 | 0.831 | 0.636 | 0.606 |
| 358 | Chemical Engineers | 57 | 0.832 | 0.641 | 0.153 |
| 359 | Computer, Automated Teller, and Office Machine Repairers | 151 | 0.832 | 0.644 | 0.179 |
| 360 | Personal Financial Advisors | 211 | 0.834 | 0.654 | 0.293 |
| 361 | Public Relations Specialists | 70 | 0.834 | 0.656 | 0.608 |
| 362 | Physical Therapists | 86 | 0.834 | 0.659 | 0.768 |
| 363 | Financial Analysts | 59 | 0.835 | 0.663 | 0.334 |
| 364 | Social Workers | 541 | 0.835 | 0.664 | 0.794 |
| 365 | Brickmasons, Blockmasons, and Stonemasons | 55 | 0.836 | 0.668 | 0.014 |
| 366 | Computer Software Engineers | 728 | 0.836 | 0.668 | 0.189 |
| 367 | Purchasing Managers | 137 | 0.836 | 0.671 | 0.431 |
| 368 | Meter Readers, Utilities | 31 | 0.836 | 0.671 | 0.038 |
| 369 | Barbers | 25 | 0.837 | 0.676 | 0.208 |
| 370 | Astronomers and Physicists | 17 | 0.838 | 0.682 | 0.177 |
| 371 | Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation | 125 | 0.838 | 0.684 | 0.459 |
| 372 | Painters, Construction and Maintenance | 221 | 0.838 | 0.684 | 0.062 |
| 373 | Drafters | 102 | 0.838 | 0.684 | 0.208 |
| 374 | Other Education, Training, and Library Workers | 61 | 0.838 | 0.684 | 0.772 |
| 375 | Other Healthcare Practitioners and Technical Occupations | 45 | 0.838 | 0.686 | 0.483 |
| 376 | Lifeguards and Other Protective Service Workers | 40 | 0.840 | 0.693 | 0.560 |
| 377 | Precision Instrument and Equipment Repairers | 37 | 0.840 | 0.696 | 0.160 |
| 378 | Agricultural Engineers | 2 | 0.840 | 0.697 | 0.363 |
| 379 | Miscellaneous Community and Social Service Specialists | 140 | 0.841 | 0.703 | 0.705 |
| 380 | Woodworkers, All Other | 13 | 0.841 | 0.706 | 0.394 |
| 381 | Plasterers and Stucco Masons | 20 | 0.842 | 0.707 | 0.022 |
| 382 | Economists | 22 | 0.842 | 0.710 | 0.276 |
| 383 | Veterinarians | 33 | 0.843 | 0.714 | 0.418 |
| 384 | Reinforcing Iron and Rebar Workers | 6 | 0.843 | 0.718 | 0.000 |
| 385 | Parts Salespersons | 61 | 0.844 | 0.725 | 0.099 |
| 386 | Production, Planning, and Expediting Clerks | 154 | 0.844 | 0.725 | 0.453 |
| 387 | Operations Research Analysts | 70 | 0.845 | 0.728 | 0.477 |
| 388 | Automotive Body and Related Repairers | 77 | 0.845 | 0.728 | 0.030 |
| 389 | Cost Estimators | 72 | 0.845 | 0.730 | 0.098 |
| 390 | Subway, Streetcar, and Other Rail Transportation Workers | 10 | 0.845 | 0.732 | 0.000 |
| 391 | Information and Record Clerks, All Other | 46 | 0.846 | 0.735 | 0.882 |
| 392 | Purchasing Agents, Except Wholesale, Retail, and Farm Products | 165 | 0.846 | 0.737 | 0.471 |
| 393 | Securities, Commodities, and Financial Services Sales Agents | 194 | 0.848 | 0.750 | 0.410 |
| 394 | Property, Real Estate, and Community Association Managers | 281 | 0.849 | 0.754 | 0.562 |
| 395 | Purchasing Agents and Buyers, Farm Products | 7 | 0.849 | 0.755 | 0.130 |
| 396 | Receptionists and Information Clerks | 477 | 0.849 | 0.756 | 0.912 |
| 397 | Financial Specialists, All Other | 33 | 0.849 | 0.756 | 0.690 |
| 398 | Textile Cutting Machine Setters, Operators, and Tenders | 4 | 0.849 | 0.758 | 0.843 |
| 399 | Computer Hardware Engineers | 47 | 0.850 | 0.764 | 0.101 |
| 400 | Mechanical Engineers | 192 | 0.850 | 0.765 | 0.066 |
| 401 | Accountants and Auditors | 1027 | 0.851 | 0.768 | 0.578 |
| 402 | Biological Scientists | 74 | 0.851 | 0.770 | 0.504 |
| 403 | Natural Sciences Managers | 15 | 0.852 | 0.779 | 0.430 |
| 404 | Home Appliance Repairers | 22 | 0.854 | 0.789 | 0.000 |
| 405 | Glaziers | 19 | 0.854 | 0.793 | 0.000 |
| 406 | Automotive Glass Installers and Repairers | 9 | 0.855 | 0.796 | 0.000 |

Continued on next page

| | Occupations | # FT Workers | ratio8to5 | ratio8to5_Std | % Females |
|---|---|---|---|---|---|
| 407 | Travel Agents | 31 | 0.855 | 0.798 | 0.816 |
| 408 | Etchers and Engravers | 4 | 0.855 | 0.799 | 0.522 |
| 409 | Photographic Process Workers and Processing Machine Operators | 24 | 0.856 | 0.804 | 0.702 |
| 410 | Physical Scientists, All Other | 88 | 0.856 | 0.805 | 0.543 |
| 411 | Technical Writers | 54 | 0.856 | 0.806 | 0.509 |
| 412 | Financial Managers | 728 | 0.857 | 0.812 | 0.538 |
| 413 | Budget Analysts | 41 | 0.857 | 0.812 | 0.617 |
| 414 | Bill and Account Collectors | 113 | 0.858 | 0.818 | 0.721 |
| 415 | Loan Counselors and Officers | 250 | 0.858 | 0.820 | 0.481 |
| 416 | Advertising Sales Agents | 109 | 0.859 | 0.823 | 0.476 |
| 417 | Advertising and Promotions Managers | 39 | 0.859 | 0.824 | 0.723 |
| 418 | Control and Valve Installers and Repairers | 13 | 0.859 | 0.825 | 0.039 |
| 419 | Loan Interviewers and Clerks | 91 | 0.860 | 0.833 | 0.718 |
| 420 | Claims Adjusters, Appraisers, Examiners, and Investigators | 218 | 0.861 | 0.837 | 0.666 |
| 421 | Preschool and Kindergarten Teachers | 346 | 0.861 | 0.840 | 0.972 |
| 422 | Medical Scientists | 83 | 0.862 | 0.843 | 0.617 |
| 423 | Correspondence Clerks | 3 | 0.863 | 0.850 | 1.000 |
| 424 | Cargo and Freight Agents | 3 | 0.863 | 0.850 | 0.367 |
| 425 | Sales and Related Workers, All Other | 100 | 0.863 | 0.852 | 0.565 |
| 426 | Human Resources, Training, and Labor Relations Specialists | 483 | 0.864 | 0.856 | 0.737 |
| 427 | Teacher Assistants | 336 | 0.864 | 0.862 | 0.911 |
| 428 | Furniture Finishers | 7 | 0.865 | 0.864 | 0.307 |
| 429 | Miscellaneous Construction and Related Workers | 14 | 0.866 | 0.870 | 0.000 |
| 430 | Computer Programmers | 283 | 0.866 | 0.870 | 0.256 |
| 431 | Recreational Therapists | 10 | 0.866 | 0.871 | 0.872 |
| 432 | Insurance Sales Agents | 290 | 0.867 | 0.881 | 0.441 |
| 433 | Small Engine Mechanics | 21 | 0.867 | 0.882 | 0.000 |
| 434 | Office Clerks, General | 345 | 0.869 | 0.891 | 0.863 |
| 435 | Meeting and Convention Planners | 42 | 0.870 | 0.897 | 0.889 |
| 436 | Insurance Claims and Policy Processing Clerks | 160 | 0.872 | 0.911 | 0.813 |
| 437 | Surveying and Mapping Technicians | 48 | 0.872 | 0.911 | 0.142 |
| 438 | Therapists, All Other | 57 | 0.872 | 0.914 | 0.816 |
| 439 | Electronic Home Entertainment Equipment Installers and Repairers | 25 | 0.872 | 0.915 | 0.000 |
| 440 | Miscellaneous Vehicle and Mobile Equipment Mechanics, Installers, and Repairers | 33 | 0.873 | 0.921 | 0.000 |
| 441 | Market and Survey Researchers | 71 | 0.873 | 0.923 | 0.767 |
| 442 | Surveyors, Cartographers, and Photogrammetrists | 23 | 0.874 | 0.927 | 0.187 |
| 443 | Miscellaneous Legal Support Workers | 115 | 0.874 | 0.928 | 0.786 |
| 444 | Billing and Posting Clerks and Machine Operators | 204 | 0.875 | 0.932 | 0.887 |
| 445 | Postal Service Mail Carriers | 212 | 0.877 | 0.944 | 0.316 |
| 446 | Speech-Language Pathologists | 56 | 0.877 | 0.947 | 0.980 |
| 447 | Insurance Underwriters | 65 | 0.881 | 0.972 | 0.571 |
| 448 | Security and Fire Alarm Systems Installers | 31 | 0.881 | 0.973 | 0.000 |
| 449 | Credit Analysts | 22 | 0.884 | 0.996 | 0.449 |
| 450 | Fence Erectors | 13 | 0.886 | 1.005 | 0.000 |
| 451 | Dietitians and Nutritionists | 41 | 0.888 | 1.018 | 0.969 |
| 452 | Eligibility Interviewers, Government Programs | 52 | 0.888 | 1.022 | 0.748 |
| 453 | Dental Hygienists | 36 | 0.891 | 1.042 | 0.977 |
| 454 | Bookkeeping, Accounting, and Auditing Clerks | 614 | 0.892 | 1.049 | 0.927 |
| 455 | Secretaries and Administrative Assistants | 1565 | 0.893 | 1.052 | 0.962 |
| 456 | Agricultural and Food Scientists | 23 | 0.895 | 1.071 | 0.356 |
| 457 | Dental Assistants | 85 | 0.896 | 1.073 | 0.988 |

Continued on next page

| | Occupations | # FT Workers | ratio8to5 | ratio8to5_Std | % Females |
|---|---|---|---|---|---|
| 458 | Librarians | 117 | 0.896 | 1.077 | 0.791 |
| 459 | Archivists, Curators, and Museum Technicians | 19 | 0.898 | 1.087 | 0.616 |
| 460 | Pest Control Workers | 29 | 0.899 | 1.098 | 0.000 |
| 461 | Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders | 6 | 0.899 | 1.099 | 0.341 |
| 462 | Nuclear Technicians | 3 | 0.907 | 1.151 | 0.121 |
| 463 | Financial Examiners | 5 | 0.908 | 1.154 | 0.253 |
| 464 | Models, Demonstrators, and Product Promoters | 10 | 0.909 | 1.165 | 0.857 |
| 465 | Actors | 8 | 0.909 | 1.165 | 0.330 |
| 466 | File Clerks | 106 | 0.909 | 1.165 | 0.836 |
| 467 | Radiation Therapists | 5 | 0.910 | 1.170 | 0.444 |
| 468 | Elevator Installers and Repairers | 9 | 0.912 | 1.180 | 0.095 |
| 469 | Occupational Therapists | 48 | 0.912 | 1.183 | 0.882 |
| 470 | Paralegals and Legal Assistants | 195 | 0.913 | 1.192 | 0.872 |
| 471 | Court, Municipal, and License Clerks | 49 | 0.913 | 1.192 | 0.797 |
| 472 | Statisticians | 25 | 0.915 | 1.206 | 0.719 |
| 473 | Credit Authorizers, Checkers, and Clerks | 35 | 0.918 | 1.222 | 0.892 |
| 474 | Locksmiths and Safe Repairers | 11 | 0.919 | 1.228 | 0.018 |
| 475 | Library Technicians | 9 | 0.920 | 1.234 | 0.770 |
| 476 | Word Processors and Typists | 70 | 0.920 | 1.240 | 0.963 |
| 477 | Physical Therapist Assistants and Aides | 34 | 0.922 | 1.250 | 0.746 |
| 478 | Funeral Service Workers | 9 | 0.925 | 1.268 | 0.100 |
| 479 | Sociologists | 5 | 0.925 | 1.271 | 1.000 |
| 480 | Library Assistants, Clerical | 32 | 0.931 | 1.315 | 0.804 |
| 481 | Paperhangers | 5 | 0.936 | 1.344 | 0.647 |
| 482 | Mathematicians | 1 | 0.938 | 1.355 | 0.000 |
| 483 | Transit and Railroad Police | 6 | 0.944 | 1.400 | 0.000 |
| 484 | Audiologists | 7 | 0.944 | 1.401 | 0.766 |
| 485 | Fabric and Apparel Patternmakers | 2 | 0.944 | 1.402 | 0.417 |
| 486 | Brokerage Clerks | 6 | 0.949 | 1.433 | 0.416 |
| 487 | Occupational Therapist Assistants and Aides | 5 | 0.951 | 1.443 | 1.000 |
| 488 | Mining and Geological Engineers, Including Mining Safety Engineers | 10 | 0.952 | 1.454 | 0.024 |
| 489 | Actuaries | 12 | 0.954 | 1.464 | 0.306 |
| 490 | Tour and Travel Guides | 9 | 0.960 | 1.506 | 0.560 |
| 491 | New Accounts Clerks | 11 | 0.970 | 1.576 | 1.000 |
| 492 | Proofreaders and Copy Markers | 5 | 0.986 | 1.682 | 0.875 |
| 493 | Desktop Publishers | 2 | 1.000 | 1.778 | 0.423 |

Notes: Data are from the 2003-2014 American Time Use Surveys (ATUS). The sample is all 18-65 years old ATUS respondents who report to be full-time workers in the activity summary file. Respondents are linked to detailed 2002 Census occupation codes of their main job. # FT Workers is the number of full-time workers by occupation. % Females is the percentage of females in each occupation. ratio8to5 is the ratio of total hours spent on "work and work-related activities" during the hours 8 a.m. to 5 p.m. relative to total hours spent on "work and work-related activities" on the diary day. Both weekdays and weekends are included. In calculating Ratio8to5, individual observations are weighted by ATUS weights for multi-year data files. "ratio8to5_std" reports standardized values with mean zero and standard deviation equal to 1.

Table A.8: Gender Gap in Log Weekly Earnings: Controlling for the Effect of Shift Work

| | (1) baseline | (2) (1)+agg. education | (3) (2)+ overwork | (4) (3)+ O*NET + fracshift |
|---|---|---|---|---|
| Panel A: All | | | | |
| female | -0.218*** | -0.254*** | -0.244*** | -0.212*** |
| | (0.0194) | (0.0129) | (0.0129) | (0.0119) |
| ratio8to5 | 0.113*** | 0.0644*** | 0.0631*** | 0.0494** |
| | (0.0170) | (0.0136) | (0.0138) | (0.0215) |
| femaleXratio8to5 | -0.0490* | -0.0457** | -0.0436** | -0.0266* |
| | (0.0264) | (0.0180) | (0.0190) | (0.0155) |
| Observations | 263245 | 263245 | 263179 | 256689 |
| Panel B: Single Without Children | | | | |
| female | -0.135*** | -0.169*** | -0.165*** | -0.131*** |
| | (0.0157) | (0.0117) | (0.0118) | (0.0114) |
| ratio8to5 | 0.102*** | 0.0623*** | 0.0613*** | 0.0301* |
| | (0.0146) | (0.0132) | (0.0131) | (0.0174) |
| femaleXratio8to5 | -0.0216 | -0.0254 | -0.0242 | -0.0079 |
| | (0.0207) | (0.0162) | (0.0168) | (0.0141) |
| Observations | 73536 | 73536 | 73516 | 71586 |
| Panel C: Married With Children | | | | |
| female | -0.263*** | -0.298*** | -0.286*** | -0.255*** |
| | (0.0229) | (0.0159) | (0.0162) | (0.0138) |
| ratio8to5 | 0.109*** | 0.0652*** | 0.0649*** | 0.0642** |
| | (0.0189) | (0.0142) | (0.0151) | (0.0262) |
| femaleXratio8to5 | -0.0626* | -0.0595** | -0.0582** | -0.0403** |
| | (0.0327) | (0.0221) | (0.0236) | (0.0194) |
| Observations | 110230 | 110230 | 110206 | 107618 |

Notes: Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .001$. Data are from the 2003-2014 ATUS-CPS files. See Table 5 for details. In Column (4) occupation-level share of shift workers are also included along with skill measures constructed from the O*NET. We use the 2004 Current Population Survey May Work Schedules and Work at Home Supplement to calculate the fraction of workers in detailed occupations who are shift workers. We define as shift workers those who worked "Evening shift," "Night shift," "Rotating shift," "Split shift," "Irregular schedule," or "Some other shift." We keep only 18-65 olds whose usual hours worked in their main job is $\geq 35$.

Table A.9: Gender Gap in Log Weekly Earnings by Concentration Index

| | (1) baseline | (2) (1)+agg. education | (3) (2)+ overwork | (4) (3)+ O*NET |
|---|---|---|---|---|
| Panel A: All | | | | |
| female | -0.246*** | -0.285*** | -0.275*** | -0.230*** |
| | (0.0136) | (0.0127) | (0.0130) | (0.0126) |
| cratio | 0.0955*** | 0.0634*** | 0.0700*** | 0.0578*** |
| | (0.0153) | (0.0123) | (0.0127) | (0.0123) |
| femaleXcratio | -0.0577** | -0.0548*** | -0.0558** | -0.0284** |
| | (0.0232) | (0.0161) | (0.0171) | (0.0142) |
| Observations | 255110 | 255110 | 255110 | 250069 |
| Panel B: Single Without Children | | | | |
| female | -0.147*** | -0.188*** | -0.183*** | -0.140*** |
| | (0.0129) | (0.0130) | (0.0138) | (0.0131) |
| cratio | 0.0906*** | 0.0635*** | 0.0667*** | 0.0560*** |
| | (0.0134) | (0.0121) | (0.0118) | (0.0102) |
| femaleXcratio | -0.035* | -0.0382** | -0.0381** | -0.0176 |
| | (0.0198) | (0.0155) | (0.0158) | (0.0135) |
| Observations | 70966 | 70966 | 70966 | 69508 |
| Panel C: Married With Children | | | | |
| female | -0.303*** | -0.342*** | -0.329*** | -0.284*** |
| | (0.0170) | (0.0166) | (0.0163) | (0.0146) |
| cratio | 0.0933*** | 0.0648*** | 0.0735*** | 0.0592*** |
| | (0.0168) | (0.0129) | (0.0146) | (0.0137) |
| femaleXcratio | -0.0770** | -0.0723*** | -0.0748*** | -0.0430** |
| | (0.0273) | (0.0189) | (0.0208) | (0.0169) |
| Observations | 106930 | 106930 | 106930 | 104875 |

Notes: Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .001$.

Data are from the 2003-2014 ATUS-CPS files. CPS data includes all individuals in the final interview month selected to participate in the ATUS and members of their households. Individuals are linked to detailed 2002 Census occupation codes of their main job. The construction of the *cratio* variable is explained in A.1.3. We only keep occupations which have observations across all 7 days of the week, which results in 322 occupations. Standard errors are clustered at the occupation level. ATUS base weights are used to weight each individual observation.

## A.5 The Effect of Taste Shocks

Table A.10: Regressions: Model vs. Data

| | Data | Model |
|---|---|---|
| female | -0.272*** | -0.06 |
| | (0.004) | |
| ratio8to5 | 0.086*** | 0.29 |
| | (0.002) | |
| femaleXratio8to5 | -0.015*** | -0.04 |
| | (0.004) | |

Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$.
Note: This table shows the estimates of the regression using individual data for married workers with children (column Data) and 22 occupations and the estimates of the same regression using data generated by the model when the taste distributions of males and females are equal (column Model). The dependent variable is earnings per hour.

Table A.11: Gender Earnings Gap (%)

| | Overall | Between | Between (Sorting) | Within |
|---|---|---|---|---|
| Data | 23.2 | −0.9 | - | 24.1 |
| Baseline | 8.9 | 1.6 | - | 7.3 |
| Equal Taste Distrib. | 10 | 3.1 | 3.8 | 6.9 |

Note: The table shows the overall gender wage gap (Overall) and its decomposition into the portion explained by the differences in the gender wage gap across occupations (Across) and the portion explained by differences in earnings between males and females within occupations (Within). The column labeled Between (Sorting) shows a between gender gap when earnings across occupations and occupation sizes are fixed at their Baseline values. The table shows the values in the data, in the baseline economy and in a counterfactual economy where there are no differences in tastes for occupations between males and females.

In this counterfactual we set the taste distributions for males and females to be the same. Specifically we set $T_{i,m} = T_{i,f} = 1$ for $i = 1, \ldots, 22$. Tables A.10 reports the regression for the model-simulated data. None of the coefficients change substantially relative to the baseline case (and are identical up to two decimals).

Equating the taste distributions has the effect of inducing females to switch to high $\alpha$ occupations (these occupations have low gender gaps). The gender gap (see A.11) rises to 10 percent, from 8.9 percent in the baseline case. This rise is entirely cause by a rise in the between component. The reallocation that moves women out of high $\alpha$ occupations lowers females' average earnings. The within drops somewhat (-0.4 percent) because high earnings (mostly low $\alpha$) occupations now become smaller in size.

## A.6 Unitary Elasticity of Substitution in Final Production

Table A.12: Regressions: Model vs. Data

| | Data | Model |
|---|---|---|
| female | -0.272*** | -0.06 |
| | (0.004) | |
| ratio8to5 | 0.086*** | 0.17 |
| | (0.002) | |
| femaleXratio8to5 | -0.015*** | -0.04 |
| | (0.004) | |

Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$. Note: This table shows the estimates of the regression using the data for married workers with children (column Data) and 22 occupations, and the estimates of the same regression using data generated by the model in its baseline calibration but assuming a Cobb-Douglas aggregate technology (column Model). The dependent variable is earnings per hour.

This counterfactual describes the outcome of reducing the elasticity of substitution across occupations from its baseline value of 3 to 1 (Cobb-Douglas). This change increases the dispersion in wage rates across occupations (because quantities can't adjust as easily as with a larger elasticity). Within an occupation little changes and as a result the link between the $ratio8to5$ and earnings weakens somewhat. This is reflected in a smaller coefficient of the regression between earnings

Table A.13: Gender Earnings Gap (%)

| | Overall | Between | Between (Sorting) | Within |
|---|---|---|---|---|
| Data | 23.2 | $-0.9$ | - | 24.1 |
| Baseline | 26.3 | 19 | - | 7.3 |
| Equal $\alpha$ ($\alpha = 2.72$) | 21.6 | 19.6 | 17.5 | 2.0 |
| 50% Drop in $\nu_m - \nu_f$ | 24.5 | 20.9 | 16.4 | 3.6 |
| Increase in $\rho$ | 26.5 | 21.4 | 18.6 | 5.0 |

Note: The table shows the overall gender wage gap (Overall) and its decomposition into the portion explained by the differences in the gender wage gap across occupations (Across) and the portion explained by differences in earnings between males and females within occupations (Within). The column labeled Between (Sorting) shows a between gender gap when earnings across occupations and occupation sizes are fixed at their Baseline values. The table shows the values in the data, in the baseline economy and in two counterfactual economies: (i) when the parameter $\alpha$ is the same across occupations and equal to 2.72 (the one corresponding to Healthcare support), (ii) when the difference between the values for $\nu_m$ and $\nu_f$ decreases by 50%, and (iii) when $\rho$ – the parameter that drives the elasticity of substitution between child care across the two time periods – rises from about 0.48 to 0.65.

and the ratio (see A.12). The coefficient drop from 0.29 in the baseline case to 0.17. It is nonetheless still large, showing that the relationship between the coordination frictions and the gender gap is robust to changes in the aggregate technology. The interaction and female coefficients barely change.

Regarding the gender gap, there is large increase in the overall wage gender gap (from 8.9 percent to 26.3 percent). This increase is entirely due to the between component (the within component does not change). The between component rises because slight negative correlation between an occupation's share of females and earnings becomes even more negative. The changes in the within component across the different counterfactuals are about the same as in the high elasticity of substitution case. The changes in the between component are the same proportionally; the only difference is that the between component is higher in all the counterfactuals.