Unbalanced Unpaid Work: Women's Household Work and the Persistence of the Gender Pay Gap

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Abstract

The unpaid labor gap between women and men is one aspect of research on women's labor market outcomes that seeks to understand the link between discrimination in the workforce and discrimination in the home. Using data from the American Time Use Survey between 2003 and 2019, a series of Oaxaca-Blinder decompositions show that approximately 90% of the unpaid labor gap is unexplained by demographic, human capital, and employment variables. Of this group of controls, employment is the most effective at explaining the unpaid work gap. Based on a series of regressions that account for household characteristics and job market information, the time women spend on unpaid work is more responsive to changes in household composition than that of men.
JEL Codes: J10, J16, J30, J70, J71

1 Introduction

In 2019, women earned 84 cents for every dollar earned by men (Semega et al. 2020). This figure is necessarily oversimplified because of substantial variation in the gender wage gap due to demographics, workforce status, and other factors. Meara, Pastore, and Webster find a gender pay gap of about 15% between October 2017 and March 2018, which grows to 27% between women working part-time and men working full time (2020). The gender pay gap is just one aspect of labor market inequalities between women and men, but because of its overarching impact on women's economic status, it is one of the most widely studied. As the gender wage gap narrows, the remaining difference between men's and women's wages becomes more difficult to explain. Exploring the driving forces behind the gender imbalance in unpaid work is one of the next steps toward a better understanding of the connection between unpaid work and the remaining gender wage gap.

By building on existing research that focuses on how industry and occupational traits impact the gender wage gap, it is possible to connect the unpaid labor that women perform to the paid labor they are compensated for. Drawing on data from the American Time Use Survey, this paper uses several Oaxaca-Blinder decompositions to explore how specific variables contribute to the difference in time spent on unpaid work between men and women. The Oaxaca-Blinder decomposition highlights that a large portion of the gender gap in unpaid work is unexplained when considering demographic,

household, and employment variability in this dataset. This suggests that gender bias plays a significant role in the unpaid work gap. Analyzing the impact of changes in household composition on the unpaid labor performed by women and men finds that the amount of time women spend on unpaid work is more responsive to changes in household structure than the time men spend on unpaid work.

2 Literature Review

Gary Becker's "A Theory on the Allocation of Time" serves as the theoretical foundation for much of the modern scholarship on unpaid work. Becker's theory proposes that the amount of time used per dollar of goods and cost per unit of time are most important in determining how people spend their time (1965). This paper was one of the first to explicitly include leisure time in economic analysis, though previous research had done so implicitly. Becker's later research on the sexual division of labor identified the benefits of specialization in human capital and the resulting division of labor between married men and women (1985). Through interviews with dozens of couples in the 1970s and 1980s, Arlie Hochschild's The Second Shift provided a more individual perspective in its exploration of the "leisure gap" between men and women, attributing the additional time that men have for leisure to strong social norms that pushed women to perform all the traditional duties of a stay-at-home wife and mother while also working outside the home (1989). Like Hochschild, most early economic research on unpaid labor largely focused on the gap in women's labor force participation and resulting outcomes.

Current research on gender and unpaid work shows that while time amount of time women spend on unpaid work varies by age, race, and region, that the gap between men and women's unpaid work is pervasive across the country. Over the last 50 years, the amount of time spent on unpaid work has generally decreased while the amount of time spent on leisure has increased. While technological improvements contribute to the decrease in hours of unpaid work, women's increased labor force participation has also decreased the time spend they spend on unpaid work (Fang and McDaniel, 2017). The increase in men's time spent on unpaid work is likely tied to both changing attitudes toward unpaid work and increased responsibilities for men when women are more likely to work outside the home. Cross-border studies of the United States and Europe show a broad trend of gender convergence in unpaid work hours that is explained primarily by changes in behavior rather than demographic shifts (Bick, Fuchs-Schündeln, and Lagakos, 2018; Pailhé, Solaz, and Stanfors, 2021).

The gradual increase in women's workforce participation has been widely studied (Blau and Kahn, 2007; Elson, 2017; Gonzales et al., 2015). While women's labor force participation now approximately equals that of men (Blau and Kahn, 2017), the way women participate is distinct. Women are more likely to work part-time, concentrated into specific industries and occupations, less likely to rise to management positions, and more likely to take extended periods of time off work. Each of these trends contributes to the gender pay gap in a different way, but together they construct a labor market that makes it nearly impossible for women to reach wage parity. The gender pay gap is related not just to differences in workforce participation, but also to significant differences across industries and occupations.

Francine Blau and Lawrence Kahn use data from the Panel Study of Income Dynamics to demonstrate that human capital variables like education and work experience do not explain the existence of the gender pay gap (2017). Industry and occupation alone account for 51% of the 2011 wage gap (Blau and Kahn, 2017). Comparing their findings to explanations of the gender wage gap, Blau and Kahn find that the importance of the labor force participation rate decreased, as did the importance of education and other human capital variables. Most of the gap between men's and women's pay is no longer explained by women working less or being less educated. Labor-force experience and work hours remain important, but gender parity in these variables has increased over time. Gender differences in formal training and turnover are closely related to disparities in experience and work hours.

In one study of these industry-based variations, Claudia Goldin (2014) finds that a flexible schedule, which is often required for women because they take on a disparate amount of childcare and housework, is associated with a lower salary in some industries. The gender wage gap is largest in industries where hours are worth more at a specific time of day. This contributes to the higher wage gaps for MBAs and JDs, whereas pharmacists and similar professions see more equal earnings. Goldin suggests that reshaping the labor market to allow for more substitution between workers, as is the case in pharmacies, would make the relationship between hours worked and earnings more linear and help close the gender pay gap. This finding is consistent with sociological research on the time constraints of women's unpaid work (Davis and Greenstein, 2013).

Studies of unpaid work commonly use self-reported data, due largely to the limited alternatives for measuring individual-level time use. Rachel Krantz-Kent (2009) uses the American Time Use Survey (ATUS) to understand gendered time use dynamics in the United States. The ATUS categorizes time use into 434 distinct categories, 127 of which Krantz-Kent identifies as unpaid household work. Unpaid household work includes activities that have a viable market substitute and are performed for one's household. This measure also includes travel time related to unpaid household activities (i.e., driving to the grocery store). Krantz-Kent finds that between 2003 and 2007, women performed an average of 10.8 more hours of unpaid household work per week than men. The amount of time spent on unpaid household work was highest for people in their mid-thirties, due in part to the amount of time spent caring for children. Fathers' time use was less responsive to the number of children in the household than mothers' time use.

Large portions of the body of literature available on the gender pay gap and women's unpaid work fall outside the bounds of economics and highlight the limitation of a purely economic approach to studying unpaid work. This research highlights the gendered division of housework and differences between the types of work women and men perform: traditionally feminine work such as laundry is repetitive, nondiscretionary, and time-consuming (Jung and O'Brien, 2019). In contrast, the unpaid work performed primarily by men, such as yard work, is more likely to be infrequent, less time consuming, and more flexible in when they can complete it. The role of power in intimate relationships is also key to understanding the relationships between unpaid work and gender. For instance, psychological research on intimate relationships argues that social norms are translated into power dynamics that drive the distribution of unpaid work within a household (Davis and Greenstein, 2013).

Commonly noted as "discrimination" and "gender bias" within economic research,

the social forces that drive women to perform such a large portion of unpaid household work in the United States are the focus of a large body of non-economic research (Bianchi et al., 2012; Ungerson, 1997; Himmelweit, 1995; Sayer, 2005; Kroska, 2004; Hook, 2006). Without the broader context of sociological, psychological, and other non-economic research, it would be more difficult to understand why there are significant gaps in the explanatory ability of economic research. While the impact of gender bias cannot be easily quantified in economic research, understanding its root causes improves the quality of economic models used in feminist economic research.

Because analyses of the gender pay gap must account for the impact of gender bias, which is not directly measurable, several techniques have been developed to explain the unexplained. To estimate the impact of discrimination on the wage gap between male and female workers, Ronald Oaxaca developed a statistical technique to analyze the sources of the wage gap. He found that at the time, much of the wage gap was explained by women's concentration in low-paying jobs and other demographic factors (Oaxaca, 1973). The technique he used has since been refined and is known as an Oaxaca-Blinder decomposition. While it has most commonly been used to better understand the causes of the gender wage gap, the Oaxaca-Blinder decomposition has more recently been applied to the gender gap in unpaid work (Kolpashnikova and Kan, 2020; Khitarishvili and Kim, 2014).

The application of this technique to the gender gap in unpaid work occurs because the ways that unpaid work and the gender pay gap are measured, as well as the factors that contribute to both gaps, are structurally similar. The Oaxaca-Blinder decomposition helps analyze the unpaid work gap because it drives a deeper understanding of the causes of the unpaid work gap and quantifies the limitations of the existing explanatory variables. The unexplained gap in the Oaxaca-Blinder decomposition is not a perfect measure of gender bias, but given a set of practical control variables, it is a rough proxy for how much of the resulting gap can be attributed to such unmeasurable variables. While the specific causes of the unexplained gap are impossible to determine, past research concurs that gender bias is one of the main unmeasurable variables.

3 Data

The American Time Use Survey (ATUS) is a nationally representative time use survey that provides estimates of how Americans spend their time collected through the Bureau of Labor Statistics. Data has been collected from over 200,000 interviews conducted between 2003 and 2020. ATUS data is linked to the Current Population Survey (CPS), which is the main source of labor force statistics in the United States and is also collected by the Bureau of Labor Statistics. The American Time Use Survey data is extracted from the Bureau of Labor Statistics' microdata using IPUMS, a University of Minnesota platform that aggregates census and survey data to increase access to family and community data. Detailed descriptions of variables and time use variables can be found through IPUMS or in the Bureau of Labor Statistics ATUS documentation.

I build a dataset with the variables detailed in Table 1 and all variables from the Activity Coding Structure and BLS Published Tables for the sample years 2003-2019. Data available for 2020 is not harmonized with previous years due to gaps in data collection during the COVID-19 pandemic and is excluded from this dataset. Where

both CPS and ATUS variables are available, this analysis uses the CPS variable (noted by "_CPS8") to align labor market activity variables with industry and occupation data, which are only available through CPS. To eliminate incorrect and incomplete data from the resulting dataset, all observations with a data quality flag as indicated by the DATAQUAL variable are removed, as are all observations with less than 1380 minutes (22 hours) of time reported because gaps in reported time may result in incomplete reporting of unpaid work.

Table 1: Extracted ATUS Variables

Variable	Label
RECTYPE	Record type
YEAR	Survey year
CASEID	ATUS Case ID
STATEFIP	FIPS State Code
MSASIZE	MSA/PMSA size
FAMINCOME	Family income
HH_NUMKIDS	Number of children under 18 in household
HH_SIZE_CPS8	Number of people in household (CPS)
PERNUM	Person line number
LINENO_CP8	Person line number (CPS)
WT06	Person weight, 2006 methodology
AGE	Age
SEX	Sex
RACE	Race
EDUC	Highest level of school completed
EMPSAT_CPS8	Labor force status (CPS)
OCC2_CPS8	General occupation category, main job (CPS)
IND2_CPS8	General industry classification, main job (CPS)
UHRSWORKT_CPS8	Hours usually worked per week (CPS)
EARNWEEK_CPS8	Weekly earnings (CPS)
SPOUSEPRES	Spouse or unmarried partner in household
SPEDUC	Highest level of school completed (spouse or partner)
SPEMPSTAT	Employment status (spouse or partner)
SPUSUALHRS	Usual work hours (spouse or partner)
SPEARNWEEK	Weekly earnings (spouse or partner)
DATAQUAL	Interview should not be used

The unpaid work time use variable is constructed based on Rachel Krantz-Kent's methodology and the BLS Published Tables time use variables. This measure of unpaid work accounts for time that is unpaid and spent on activities that have a readily available market substitute (childcare, cleaning, etc.), as well as travel time related to the unpaid household activity (driving to the grocery store) (Krantz-Kent, 2009). Unpaid work that benefits another household, such as unpaid care work for a neighbor's children, is excluded from this measure, as is consistent with other measures of unpaid household work. The time use variables included in constructed variables for daily minutes of unpaid work and weekly hours of unpaid work are detailed in Table 2.

In some instances, weekly hours of unpaid work are a more helpful measure because it is easier to conceptualize the impact of such gaps.

Table 2: Time Use Variables Included in Unpaid Household Work

Time Use Variable	Label
BLS_HHACT	BLS: Household Activities
BLS_CAREHH_ADULT	BLS: Caring for and helping household members: Caring for and helping household adults
BLS_CAREHH_KID	BLS: Caring for and helping household members: Caring for and helping household children
BLS_CAREHH_TRAVEL	BLS: Caring for and helping household members: Travel related to caring for and helping household members
BLS_PURCH_BANK	BLS: Purchasing goods and services: Financial services and banking
BLS_PURCH_CONS	BLS: Purchasing goods and services: Consumer goods purchases
BLS_PURCH_GROC	BLS: Purchasing goods and services: Grocery shopping
BLS_PURCH_HHSERV	BLS: Purchasing goods and services: Household services
BLS_PURCH_HOME	BLS: Purchasing goods and services: Home maintenance, repair, decoration, and construction (not done by self)
BLS_PURCH_TRAVEL	BLS: Purchasing goods and services: Travel related to purchasing goods and services

Based on the ATUS data, women perform an average of 10 hours more unpaid household work than men. Women in the workforce perform an average of 8.3 hours more unpaid work than men in the workforce, and 8.7 more hours than men overall, as detailed in Table 3. Women who are employed work fewer paid hours, an average of 37 compared to the average of 42.2 for employed men. Employed women also have lower weekly earnings than employed men by $223. These findings are consistent with other estimates of the gender gap in unpaid and paid work, as well as the gender pay gap (Blau and Kahn, 2017; Krantz-Kent, 2009; Bick et. al, 2018).

Table 3: Average Weekly Time Use and Earnings

	Male		Female	
	Mean	Std. Dev.	Mean	Std. Dev.
Weekly Hours of Unpaid Work (Full Sample)	19.38	0.07	29.33	0.07
Weekly Hours of Unpaid Work (Employed Only)	19.78	0.09	28.09	0.1
Typical Hours Worked per Week	42.23	0.05	37.01	0.05
Typical Weekly Earnings	916.14	3.11	693.27	2.37

3.1 Data Limitations

Any self-reported data may be biased by errors in reporting accuracy or people's memory. Selection bias is a common concern in survey data, but the American Time Use Survey provides weights to account for demographic variation and populations with low response rates. This minimizes such concerns in the data. Data quality flags in the ATUS also provide a simple way to filter out data that has been identified as unreliable by the survey staff. Beyond the accuracy of time use data, there are limitations on the types of analysis that can be performed with time use data. Because time use data is recorded by one person for one day, it does not account for variability in time use for that specific person across different days. When considering long-term trends, this

means that time use data should be understood as a report of person-days spent on a specific activity. Most concerns surrounding the use of time use variables are relevant when using time use variables as a dependent variable, which is not the case in this analysis (Frazis and Stewart, 2012).

4 Methodology

The analysis is divided into two parts. First, a series of Oaxaca-Blinder decompositions is used to understand which variables have the most impact on the gender gap in unpaid work. These decompositions also compare the influence of variables based on whether the observations being analyzed are individuals in the workforce or the population at large. The second part of the analysis uses a set of regressions to understand how the composition of a household is related to the amount of time spent on unpaid work within that household. While these questions are interesting for the population at large, this research focuses specifically on individuals in the labor force because of the focus on the link between unpaid work and the gender pay gap.

4.1 Oaxaca-Blinder Decompositions

An Oaxaca-Blinder decomposition is employed to help understand what causes the gap in unpaid work performed by women and men. The Oaxaca-Blinder method is commonly used to analyze the gender wage gap and is suitable in this labor market-adjacent instance because of the similarities between the gender wage gap and analysis of unpaid work. It generates a measure of the change in *unpaid_work* when men are assigned the same characteristics as women, which is the "Endowments" effect. The characteristics assigned to men are the coefficients of the underlying regression that shows the change in women's unpaid work based on different explanatory variables. This technique uses two ordinary least squares (OLS) regressions, in this case separated by male and female respondents. In the simplified model:

$$Y_m = X_m\beta_m + u_m \tag{1}$$

$$Y_f = X_f\beta_f + u_f \tag{2}$$

Y is the minutes of unpaid work, X is the control variable, and u is the error term. Where b is the OLS estimator of β, $\bar{X}$ is the predicted value of X, and $\bar{Y}$ is the predicted value of Y given b and $\bar{X}$,

$$\bar{Y}_m - \bar{Y}_f = b_m\bar{X}_m - b_f\bar{X}_f = b_m(\bar{X}_m - \bar{X}_f) + \bar{X}(b_m - b_f) \tag{3}$$

In this model, $b_m(\bar{X}_m - \bar{X}_f)$ is the "impact of gender differences in explanatory variables evaluated using male coefficients," and $\bar{X}(b_m - b_f)$ is the "unexplained differential" (Blau and Kahn, 2017, 799-800).

The first part of this analysis explores the impact of employment on the gender gap in unpaid work. The initial regression accounts for household characteristics. This model is represented by:

$$unpaid\_work = \beta_0 + \beta_1 age + \beta_2 race + \beta_3 hh\_numkids + \beta_4 spouse + \beta_5 spouseemp + u \quad \text{(A)}$$

where *unpaid_work* is the minutes of unpaid work per day, *age* is the age of the individual, *race* is the respondent's race, *hh_numkids* is the number of children under 18 in the household, *spouse* accounts for the presence of a spouse or unmarried partner in the household, *spouseemp* is the employment status of the spouse, and u is the error term. Unmarried partners living in the household are considered spouses because this model assumes that cohabitation influences the distribution of work more than marriage. In addition to the variables in regression (A), the second model includes variables that account for basic employment characteristics as follows:

$$\begin{aligned} unpaid\_work = {} & \beta_0 + \beta_1 age + \beta_2 race + \beta_3 hh\_numkids + \beta_4 spouse \\ & + \beta_5 spouseemp + \beta_6 employed + \beta_7 hrswork t + \beta_7 earnweek + u \quad \text{(B)} \end{aligned}$$

In this model, *unpaid_work* is the minutes of unpaid work per day, *age* is the age of the individual, *race* is the respondent's race, *hh_numkids* is the number of children under 18 in the household, *spouse* accounts for the presence of a spouse or unmarried partner in the household, *spouseemp* is the employment status of the spouse, *spouseemp* is the employment status of the spouse, *hrsworkt* is the average weekly hours worked, *earnweek* is the average weekly earnings, and u is the error term.

The portion of the same that is in the labor force is isolated using another pair of Oaxaca-Blinder decompositions. In understanding how unpaid work is related to the gender pay gap, this section of the sample is most relevant. Regression (A) is used for the first half of this analysis, where is it applied to only those observations in the labor force. The third model is represented by:

$$\begin{aligned} unpaid\_work = {} & \beta_0 + \beta_1 age + \beta_2 race + \beta_3 hh\_numkids \\ & + \beta_4 spouse + \beta_5 spouseemp + \beta_6 hrswork t + \beta_7 earnweek + u, \quad \text{(C)} \end{aligned}$$

where *unpaid_work* is the minutes of unpaid work per day, *age* is the age of the individual, *race* is the respondent's race, *hh_numkids* is the number of children under 18 in the household, *spouse* accounts for the presence of a spouse or unmarried partner in the household, *spouseemp* is the employment status of the spouse, *hrsworkt* is the average hours of work per week, *earnweek* is average weekly earnings, and u is the error term.

4.2 Time Spent on Unpaid Work

This section of the paper focuses only on individuals in the workforce, so it analyzes only those observations where employed is equal to 1. The impact of the presence of a

spouse and children on weekly hours of unpaid work is represented by:

$$unpaid\_weeklyhrs = \beta_0 + \beta_1 age + \beta_2 race + \beta_3 hh\_numkids + \beta_4 spouse + \beta_5 spouse * spouseemp + \beta_6 hrsworkt + \beta_7 earnweek + u \quad \text{(D)}$$

where *unpaid_weeklyhrs* is the respondent's hours of unpaid work per week, *age* is the age of the individual, *race* is the individual's race, *hh_numkids* is the number of children under 18 in the household, *spouse* accounts for the presence of a spouse or unmarried partner in the household, *spouse*spouseemp* is an interaction term between the presence of a spouse and the employment status of the spouse, *hoursworkt* is the average hours of work per week, *earnweek* is average weekly earnings, and u is the error term. The interaction between spouse presence and spouse's employment status is used to account for observations with no spouse. Next, this regression is modified to account for the interaction between the number of children and the presence of a spouse. This model is represented by:

$$unpaid\_weeklyhrs = \beta_0 + \beta_1 age + \beta_2 race + \beta_3 hh\_numkids + \beta_4 spouse + \beta_5 spouse * hh\_numkids + \beta_6 hrsworkt + \beta_7 earnweek + u \quad \text{(E)}$$

where *unpaid_weeklyhrs* is the respondent's hours of unpaid work per week, *age* is the age of the individual, *race* is the individual's race, *hh_numkids* is the number of children under 18 in the household, *spouse* accounts for the presence of a spouse or unmarried partner in the household, *spouse*hh_numkids* is an interaction term between the presence of a spouse and the number of children in the household, *hoursworkt* is the average hours of work per week, *earnweek* is average weekly earnings, and u is the error term. The interaction term between *spouse* and *hh_numkids* is used to understand how the presence of a spouse impacts the change in unpaid work associated with children's presence in the household.

5 Results

The purpose of the Oaxaca-Blinder decomposition in this analysis is to understand which variables drive the gender gap in unpaid work. In the first decomposition, which only accounts for household and demographic characteristics, implementing the Oaxaca-Blinder decomposition shows that men's unpaid work would increase by an average of 1.5 minutes per day if they had the same demographic characteristics as women (Table 4). This explained portion of the unpaid work gap is very small (1.5 minutes of the 85-minute gap) but statistically significant at $p < 0.05$. When accounting for household, demographic, and employment characteristics in the Oaxaca-Blinder decomposition, this analysis shows that men's unpaid work would increase by an average of 7.6 minutes per day if they had the same characteristics as women (Table 5).

This result is statistically significant and, over a week, accounts for almost an hour of the unpaid work gap between men and women. While most of the gap in unpaid work remains unexplained and may be attributed to gender bias or discrimination within the home, the impact of employment is comparatively much larger than that of household characteristics. This is consistent with existing literature that highlights the different employment choices that women make to care for their children (Anderson and

Levine, 1999; Ribar, 1992; Connelly, 1992). This also suggests that the characteristics of different workplaces may have an outsized impact on the way women chose to allocate their time (Goldin, 2014).

Table 4: Oaxaca-Blinder Decomposition (Full Population)

	(1)	(2)
Variables	Differential	Decomposition
Prediction_Male	166.1***	
	(0.617)	
Prediction_Female	251.4***	
	(0.628)	
Difference	-85.33***	
	(0.881)	
Endowments		-1.493***
		(0.418)
Coefficients		-84.15***
		(0.878)
Interaction		0.313
		(0.373)
Observations	188437	188437

Note: Standard errors in parentheses: ***p<0.001, **p<0.05, *p<0.1

Table 5: Oaxaca-Blinder Decomposition including Demographic Variables (Full Population)

	(1)	(2)
Variables	Differential	Decomposition
Prediction_Male	166.1***	
	(0.617)	
Prediction_Female	251.4***	
	(0.628)	
Difference	-85.33***	
	(0.881)	
Endowments		-7.607***
		(0.519)
Coefficients		-84.45***
		(0.912)
Interaction		6.732***
		(0.548)
Observations	188437	188437

Note: Standard errors in parentheses: ***p<0.001, **p<0.05, *p<0.1

For the second set of Oaxaca-Blinder decompositions, which consider only those observations that are employed, there would be small but statistically significant increase in men's unpaid work if they had the same household and demographic characteristics as women. In this case, 2.7 minutes of the 73-minute gap in daily unpaid work can be explained (see Table 6). In this subset of observations, the household and demographic characteristics explain a larger portion of the gender gap in unpaid work than they do when considering all observations. The Oaxaca-Blinder decomposition that considers demographic, household, and employment characteristics for the employed subset of the data only explains 0.4 minutes of the unpaid work gap and is not statistically significant (Table 7). These results highlight the strong role of unexplained factors in the gender gap in unpaid work. While gender bias is not the only excluded variable and is not the entire explanation, it likely plays a significant role in accounting for the remaining gap.

Table 6: Oaxaca-Blinder Decomposition (Employed Population)

Variables	Differential	Decomposition
Prediction_Male	169.6***	
	(0.757)	
Prediction_Female	240.7***	
	(0.816)	
Difference	-71.17***	
	(1.113)	
Endowments		2.783***
		(0.551)
Coefficients		-73.23***
		(1.113)
Interaction		-0.724
		(0.515)
Observations	112276	112276

Note: Standard errors in parentheses: ***p<0.001, **p<0.05, *p<0.1

The Oaxaca-Blinder decomposition is limited by the number of unobserved variables that influence the data. A model that accounts for additional variables such as metropolitan area and elder care would be more detailed, but it is possible that even a more comprehensive model would only explain limited portions of the unpaid work gap. Compared to the gender pay gap, there are fewer potential explanatory variables that can be easily measured and analyzed because factors that influence the unpaid labor gap are often non-market factors that are less frequently measured or tracked. This influences both how comprehensive the Oaxaca-Blinder decomposition is and the potential omitted variable bias in other regressions.

Table 7: Oaxaca-Blinder Decomposition incl. Demographic Variables (Employed Population)

Variables	(1) Differential	(2) Decomposition
Prediction_Male	169.6***	
	(0.757)	
Prediction_Female	240.7***	
	(0.816)	
Difference	-71.17***	
	(1.113)	
Endowments		-0.403
		(0.684)
Coefficients		-74.23***
		(1.165)
Interaction		3.457***
		(0.743)
Observations	112276	112276

Note: Standard errors in parentheses: ***p<0.001, **p<0.05, *p<0.1

While the Oaxaca-Blinder decompositions find that household and demographic characteristics play a small role in explaining the unpaid work gap, this does not mean that they are unimportant. Because the composition of a household is the primary factor that influences how much work is required for the household to function, studying how that work is distributed when the household changes can highlight continued inequities in unpaid work. This section of the analysis uses only data from ATUS respondents who are employed because the driving force of this research is the connection between unpaid work and the gender pay gap.

Using a regression that controls for age, race, number of children, weekly hours, spouse presence, and whether the spouse is employed, women's unpaid work increases by an average of 3.3 hours per week when a spouse or unmarried partner is present in the household and does not work, compared to an increase of 3.5 hours per week when the spouse does work. For men, unpaid work increases by 2.2 hours when a spouse is present and does not work, versus only 2.1 hours when an employed spouse is present in the household. Because women's baseline for time spent on unpaid work is higher (11.6 hours versus 8 hours), this unequal distribution of additional work is especially notable. Full regression results are detailed in Table 8. The low R-squared value is likely related to a high level of unexplained variation in the Oaxaca-Blinder decomposition and is reflective of the numerous variables influencing time allocation. This analysis uses a set of variables that are consistent with other time use studies and the low R-squared value should not be a cause for concern.

Table 8: Predicted Hours of Unpaid Work

Variables	(Male) unpaid_weeklyhrs	(Female) unpaid_weeklyhrs
age	0.0970***	0.166***
	(0.008)	(0.00947)
race	0.000424	-0.0229***
	(0.00745)	(0.007)
hh_numkids	2.362***	5.308***
	(0.111)	(0.128)
spouse	2.174***	3.339***
	(0.291)	(0.428)
0b.spouseemp#co.spouse	0 (0)	0 (0)
1.spouseemp#c.spouse	2.138***	3.500***
	(0.263)	(0.428)
earnweek_cps8	-1.32e-05***	2.61e-05***
	(3.21e-06)	(4.93e-06)
Constant	8.048***	11.68***
	(0.86)	(0.923)
R-squared	0.042	0.107
Observations	55173	57103

Note: Standard errors in parentheses: ***p<0.001, **p<0.05, *p<0.1

Using the same controls variables and an interaction term between the presence of a spouse and the number of children, this analysis shows that women with spouses spend an additional 6.3 hours per week on unpaid work if they have one child, 6.8 hours if they have two children, and 5.9 hours if they have three children. Men with spouses spend an additional 4 hours per week on unpaid work if they have one child, 4.8 hours if they have two children, and 4.1 hours if they have three children. For this regression, women's baseline for unpaid work is 12.5 hours and men's is 8.6. Full regression results are detailed in Table 9. These results follow the same pattern as the model that considers the interaction between the presence of a spouse and the spouse's employment status. Overall, the increase in unpaid work associated with a change in household characteristics is much larger for women than it is for men.

Table 9: Predicted Hours of Unpaid Work, Including Number of Children

Variables	(Male) unpaid_weeklyhrs	(Female) unpaid_weeklyhrs
age	0.102***	0.171***
	(0.00806)	(0.00927)
race	-0.00232	-0.0248***
	(0.00737)	(0.00694)
hh_numkids	1.046***	4.093***
	(0.211)	(0.211)
spouse	2.169***	3.562***
	(0.268)	(0.299)
0b.hh_numkids#co.spouse	0 (0)	0 (0)
1.hh_numkid#c.spouse	4.008***	6.262***
	(0.385)	(0.429)
2.hh_numkids#c.spouse	4.851***	6.810***
	(0.513)	(0.553)
3.hh_numkids#c.spouse	4.115***	5.919***
	(0.755)	(0.857)
4.hh_numkids#c.spouse	3.017***	1.494
	(1.145)	(1.608)
5.hh_numkids#c.spouse	3.503*	-0.153
	(1.873)	(2.969)
6.hh_numkids#c.spouse	17.30**	-3.438
	(7.543)	(5.723)
7.hh_numkids#c.spouse	-0.577	5.196
	(4.047)	(8.79)
8.hh_numkids#c.spouse	1.206	-24.99**
	(8.003)	(10.31)
9.hh_numkids#c.spouse	53.84***	0 (0)
	(7.947)	
10.hh_numkids#c.spouse	25.79***	0 (0)
	(2.103)	
earnweek_cps8	-1.28e-05***	2.81e-05***
	(3.22e-06)	(4.95e-06)
Constant	8.597***	12.47***
	(0.853)	(0.926)
Observations	55173	57103
R-squared	0.045	0.114

Note: Standard errors in parentheses: ***p<0.001, **p<0.05, *p<0.1

This finding is consistent with other studies that find that the amount of time women spend on unpaid work is more responsive to changes in household structure than men's (Blau and Kahn, 2017; Fang and McDaniel, 2017). While men take on some additional unpaid work as the amount of work required for the household to function increases, they take on comparatively less work than women. Based on the limited impact of household characteristics in the Oaxaca-Blinder decomposition, this difference is due to unexplained factors. These unexplained factors may include either unmeasured variables or the more general presence of "discrimination" in unpaid work expectations. Because of the significant role that gender bias plays in determining how time is allocated within the home, gender bias is likely the cause of much of this

6 Conclusion

Over time, the portion of the gender pay gap that is explained by education, experience, and labor force participation has fallen significantly. The line between the personal and professional is often blurry, but it is especially blurry in conversations about the relationship between women's unpaid work and labor market outcomes. The way women spend their time within the home is closely related to women's decisions to enter and exit the job market, but also to the decisions they make about industry, occupation, and number of hours worked. The influence of time allocation within the home does not stop after women decide to enter the job market. Unpaid work and other responsibilities within the home influence women's labor market outcomes throughout their careers.

Two Oaxaca-Blinder decompositions highlight the underlying causes of the gender gap in unpaid work: one that accounts for household and demographic characteristics and one that accounts for household, demographic, and employment characteristics. These decompositions find that a small but statistically significant portion of the unpaid work gap is explained by the variation in household and demographic characteristics between women and men, but that a larger portion of the gap is explained by employment characteristics (employment status, earnings, and hours worked). The significant portion of the gender gap in unpaid work that is unexplained indicates that there are unaccounted for variables that play a much larger role in determining how men and women spend their time within the home. Based on existing economic and sociological research, it is likely that this unexplained portion of the difference in unpaid work is driven by social expectations, power dynamics in intimate relationships, and other factors that together are best characterized as gender bias.

The three main regression models illustrate how the relationship between unpaid work and household characteristics to understand how changes in unpaid work vary for people who are employed. The presence of children in the household is associated with more of an increase in unpaid work for women than for men. Similarly, the presence of a spouse and a spouse's employment status are associated with a larger change in women's unpaid work than in men's unpaid work. This is consistent with the Oaxaca-Blinder decomposition, which finds that changes in unpaid work are not explained by household characteristics alone. This is also consistent with existing research that finds that women take on a disproportionate burden when the quantity of household work changes (Fang and McDaniel, 2017). This disproportionate burden-sharing is also

reflected in the model that includes the impact of children and the interaction between the presence of a spouse and the number of children.

Future research should focus on exploring other potential variables that can decrease the unexplained portion of the Oaxaca-Blinder decompositions. The links between unpaid work and industry-specific labor market factors, like the ability to work flexible hours, could be an important step to understanding why the remaining gender pay and unpaid work gaps exist. Especially because industry and occupation account for much of the remaining pay gap, a careful analysis of women's unpaid work across industries and occupations may explain more of the unpaid work gap than household characteristics. Industries that have more equal distributions of unpaid work can serve as a starting place for designing workforce and welfare policies that facilitate more equal distributions of work within the household. Accounting for unpaid work burdens should be a focus of policies designed to address the gender pay gap, and research that explores the nuances of the gender pay gap is an important step toward designing suitable policy interventions.

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