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The Great Recession and Unpaid Work Time in the United States: Does Poverty Matter?

by

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Abstract

Poverty status is an important factor influencing household production and the unpaid work time associated with it due to the role of household production as a coping strategy in mitigating the impact of economic downturns. In this paper, we examine the presence of poverty-based asymmetries in the unpaid work time changes of men and women during the Great Recession. Using the 2003–12 American Time Use Survey, we find that these changes indeed varied by poverty status. In particular, nonpoor women drove the reduction in unpaid work time among women. Among men, the lack of the change in unpaid work time masked the increase in poor men's time and the decrease in nonpoor men's time. Oaxaca-Blinder decompositions of the changes in the unpaid work time reveal that shifts in own and spousal employment status largely account for the gender-based differences in these changes, while shifts in the household structure partially explain the poverty-based differences. Nevertheless, sizable portions of the changes in time use remain unexplained by the shifting individual and household characteristics. The latter finding supports the hypothesis of poverty-based variation in the unpaid work time adjustments in that poor and nonpoor individuals appeared to have responded to the recession in different ways.

Keywords: Time Use; Household Production; Poverty; Gender; Great Recession
JEL Classifications: J22, D13, I32, J16

1. INTRODUCTION

The Great Recession resulted in significant reductions in jobs, paid work hours, and household income in the United States. In times of economic crises, the increase in household production, and in the unpaid work time associated with it, can serve as a major coping strategy through which the absorption and the alleviation of the impact of recessions on household welfare can take place. Evidence from the Great Recession has been supportive of the coping strategy hypothesis highlighted by the findings that the decline in the unpaid work-time observed during this period was the net outcome of the modest *cyclical increase* in the unpaid work-time outweighed by the long-term downward trend (Aguiar et al. 2013). This evidence also reveals the presence of gender asymmetries in cyclical unpaid work-time changes that stem from men having experienced disproportionately high job losses during the Great Recession (Albanesi and Şahin 2013), leading them to cyclically increase their unpaid work-time relative to women.

One of the central forces motivating unpaid work-time changes is poverty as the need to substitute market goods for household-produced goods can be an important impetus for unpaid work-time changes, especially during recessions. The recognition of this possibility has been evident in the growing body of literature analyzing distributional variation in unpaid work-time shifts (Folbre et al. 2013; Meyer and Sullivan 2008; Zacharias, Antonopoulos, and Masterson 2012). However, the question of the link between poverty status and unpaid work-time changes during the Great Recession has not yet received due attention.

In this paper, we address this gap and extend the studies analyzing the gender variation in unpaid work-time changes during the recession by incorporating the poverty dimension. Using the 2003 – 2012 American Time Use survey data, we separate the sample of men and women into poor and nonpoor segments and evaluate whether the changes in unpaid work-time vary by poverty status. Moreover, we take the analysis of the factors responsible for unpaid work-time changes during the Great Recession beyond the role of employment shifts analyzed in the literature (Berik and Kongar 2011). To that end, we conduct the Oaxaca-Blinder decomposition of the unpaid work-time changes of the four groups by considering, in addition to own employment status, other individual and household characteristics that are likely to affect unpaid work time. This enables us to gain a better understanding of the broader forces underlying the movements in the unpaid work time during the Great Recession. In order to

evaluate the changes along the business cycle, we conduct the decompositions between pre-recession and recession periods, and between recession and post-recession periods.

Our findings reveal that that the changes in the unpaid work time of men and women during the Great Recession indeed varied by poverty status. In particular, between the-precession and recession periods, the lack of a change in men's unpaid work time disguised the increase in poor men's unpaid work time and the decrease in nonpoor men's unpaid work time. This suggests that the market/household goods substitution may have indeed taken place among men, but dominated only among the poor. Neither group appears to have changed its unpaid work time between recession and post-recession periods, revealing that the poor/nonpoor gap among men persisted after the recession. The reduction in women's unpaid work appears to be driven by nonpoor women, as only they reduced their unpaid work during both time segments. Poor women did not exhibit the reductions during either of the two time segments, once again suggesting that poverty status did play a role in the way in which individuals shifted their unpaid work time. Our investigation of the reasons behind these developments reveals that, in addition to the changes in own employment status, shifts in spousal employment status played a considerable role in explaining gender differences in unpaid work-time changes. In turn, varied shifts in the household structure were important drivers of the differences in the unpaid work-time changes between poor and nonpoor households. Importantly, we find that the forces underlying the changes in unpaid work time are not limited to the changes in individual and household characteristics, as the portion of the unpaid work-time changes that is unexplained by these characteristics remains sizable. This finding supports the hypothesis of poverty-based variation in the unpaid work-time adjustments in that, even without shifts in the characteristics, poor and nonpoor individuals appear to have responded to the recession in different ways.

The rest of the paper is organized as follows. The literature and conceptual framework section reviews relevant previous works, placing this study in the context of the empirical studies on unpaid work and provides a conceptual framework for analyzing the relationship between unpaid work time and income shocks. In the data and methodology section, we review the data, breaking it down by gender and poverty status, and discuss the Oaxaca-Blinder decomposition approach used in the analysis. The results section describes our findings. It highlights the differences by poverty status in the unpaid work adjustments of men and women. Importantly, it elaborates on the forces responsible for the differences in the unpaid work adjustments. We discuss the implications of our study in the conclusions.

2. LITERATURE AND CONCEPTUAL FRAMEWORK

The analysis of household production in the economic literature has been in part motivated by its potential role in mitigating the welfare impact of output fluctuations (Gronau 1977; Benhabib, et al. 1991; Greenwood and Hercowitz 1991). In the context of household production models, income shocks can result in the substitution of household production for market production *increasing* the unpaid work time (*substitution effect*). On the other hand, the contraction in household income may result in the increase in work hours (e.g. added worker effect) in order to compensate for the income loss and in the corresponding *decrease* in the household production time (*income effect*). In cases in which the increase in work hours is not possible (e.g. due to weak labor market conditions), the substitution effect may dominate, resulting in an overall *increase* in *unpaid work time*. On the other hand, if individuals have an opportunity to increase their work hours, the *unpaid work time* may *decrease*.

In addition to income shocks per se, their causes are likely to be important to the final changes in the unpaid work time. If the income shock is experienced via own employment loss or work-hour reduction, household production time is likely to increase. On the other hand, if the income shock is experienced via spousal job loss, an individual's unpaid work time might contract if the spouse increases their unpaid work. Indeed, Solaz (2005) provides the evidence of the transfer of domestic chores in response to the spousal job loss among both men and women in France.

Beyond the causes of income shocks, their immediate consequences, too, may influence unpaid work allocation. For example, if income shocks result in changes in household composition, as happened when the average household size increased post-2008 after years of continuous decline (U.S. Census Bureau 2012), the unpaid work of individual household members may change, as well.

Feminist literature has emphasized the need to explicitly incorporate the presence of gender asymmetries into the analysis of household production behavior (Agarwal, 1997). The differences in the way the Great Recession has affected men and women make it possible to make preliminary gender predictions about the directions of the changes in their unpaid work time. To the extent that a greater proportion of men became unemployed during the Great Recession (Albanesi and Şahin 2013), their unpaid work was more likely to have increased compared to women, as unemployed individuals spend more time on unpaid work than

employed individuals. Furthermore, evidence indicates that men's ability to find a new job or increase their work hours in order to supplement the initial reduction in earnings has been undermined by the particularly weak state of the industries, in which men's employment is concentrated (Şahin, Song, and Hobijn 2010). As a result, the substitution of household-produced goods for market goods may have emerged as a more likely coping mechanism among men, increasing their unpaid work time. Furthermore, women may have experienced stronger downward pressure on their unpaid work compared to men as women were more likely to experience a spousal job loss, given that men's employment status took a stronger hit.

Empirical literature documenting time use patterns has revealed that between the 1960s and the onset of the Great Recession in 2008 working hours in the United States did not change while unpaid work time contracted and leisure time increased (Aguiar and Hurst 2007; Ramey and Francis 2009; Gelber and Mitchell 2008). These trends masked important gender differences. Whereas the leisure time of both men and women increased during that period, their working hours and unpaid work moved in opposite directions. In particular, women's working hours increased and their unpaid work decreased, and the opposite held for men. Hence, although women remain the primary providers of household production, the gender gap in the unpaid work time in the United States has contracted since the 1960s (Ramey and Francis 2009). Evidence from other industrialized countries reveals similar gender patterns in paid and unpaid work since the 1970s although the increase in the leisure time evident in the United States was not present in all countries (Gimenez-Nadal and Sevilla 2012). These trends are consistent with the feminist literature arguing that increases in women's labor force participation strengthened their bargaining power contributing to the reduction in women's household production activities (Agarwal 1997; Bittman et al. 2003).

The Great Recession brought with it a reduction in working hours in the United States accompanied by a decrease in the unpaid work time and an increase in leisure time. Aguiar et al. (2013) view these movements as the net effect of long-term trends and cyclical forces. They separate trends from cyclical shifts using state-level changes in time use. They find that the decrease in working hours observed during the Great Recession was associated with a modest 35% *cyclical increase* in unpaid work time, consistent with the view that household production rises during economic downturns. The evidence based on static variation in the economic environment appears to support the conjecture that cyclical worsening of the labor market environment raises household production. For example, Burda and Hamermesh (2010) find that

in the United States, the states experiencing higher increases in unemployment also exhibit higher levels of household production. In a related finding, Spanish regions with higher unemployment rates exhibit higher levels of household production among unemployed individuals (Gimenez Nadal et al. 2010).

Adding the gender dimension to the discussion of the empirical developments during the Great Recession once again reveals asymmetries. In particular, during this period, women's unpaid work time decreased whereas men's unpaid work time increased, albeit not statistically significantly. Separating the cyclical component from the long-term trend, Aguiar et al. (2013) find that cyclically men and women allocated a similar fraction of foregone market hours to increased unpaid work. Given the greater reduction in men's work hours compared to women's work hours, this implies that, cyclically, men increased their unpaid work time more than women. Focusing on married individuals only, Berik and Kongar (2013) find that women's unpaid work time cyclically contracted whereas men's unpaid work time did not change, potentially due to the presence of the added worker effect among married women during the recession (Şahin, Song, and Hobijn 2010).

To the extent that the use of unpaid work time to compensate for economic shocks is dependent on household income status, poverty status plays a central role in determining time use adjustments, although predictions about poverty status-based differences in unpaid work-time changes are less clear than gender-based predictions. On the one hand, if the dominant consequence of the income contraction is a stronger substitution of household goods for market goods among poorer households (e.g., the added worker effect cannot be translated into employment), the *increase* in poor individuals' unpaid work time is likely to be stronger. On the other hand, income contraction may induce a stronger added worker effect in poor households. If the presumed stronger added worker effect among poorer households is followed by subsequent employment, a greater *reduction* in the unpaid work time of poor individuals may take place. Hence, the final effect of income shocks on the adjustments in the unpaid work time of poor and nonpoor individuals is ambiguous and has to be assessed empirically. Although a growing body of empirical literature has evaluated the link between household production activities and income distribution, this question has not received its due attention in the context of the Great Recession (Folbre et al. 2013; Frazis and Stewart 2006; Gelber and Mitchell 2008; Meyer and Sullivan 2008; Zacharias, Antonopoulos, and Masterson 2012).

3. DATA AND METHODOLOGY

We use the American Time Use Survey (ATUS) for 2003 – 2012. The ATUS collects time use information from a nationally representative pool of residents of households who are at least 15 years of age, civilian and not-institutionalized. It draws from a subsample of households completing their final months of interviews in the Current Population Survey (CPS). After two to five months following the final CPS interview, one individual per household in this subsample is randomly selected and interviewed over the phone. This person is asked to recount their activities over the previous 24 hours. With the exception of 2003, when over 20,000 were collected, each year between 2003 and 2012 includes about 14,000 diaries. We exclude observations for the respondents who are younger than 18 and older than 65 years old and for the records for which interviewers reported the presence of data quality issues for reasons of ambiguous recall and deliberate misinformation. To enable the assignment of the household-level poverty status, observations without reported family income were dropped. In the end, 97,064 diaries remain in the final dataset. In all our estimations, observations are weighted by the ATUS sampling weights.

In order to identify the poverty status of individuals, we adopt the federal poverty guideline issued by the Department of Health and Human Services. The poverty guideline is adjusted for year, household size, and location (including the lower 48 states, Alaska and Hawaii).[2] Family income recorded at the time of the final CPS interview is used as the basis for poverty identification. Family income includes the monetary income from all members of the household who are 15 years of age or older (i.e., wage earnings, business income, farm or rent, social security and other pensions, capital income, and so on). The income information is available only as a categorical variable on an ascending scale of 1 through 16, and the income category in which the poverty guideline is nested is classified as poor. As an example, 130 percent of the poverty guideline for a one-person household in a lower-48 state in 2003 was $11,674, and it was nested in the family income bracket of $10,000 to $12,499 with the code value 4 in the ATUS. The cases with family income at or below 4 were classified as income poor. In this approach, the poverty rate may be overestimated to the extent that some nonpoor

[2] An alternative would be the poverty thresholds produced by the Census Bureau. The two sets of guidelines result in the poverty estimates, which are only marginally different.

individuals are classified as poor.[3] Table 1 shows that the poverty rate increased between 2003 and 2012, especially since the onset of the recession in 2008. The annual changes in the poverty rate at 130 percent of the guidelines are statistically significant at 10 percent starting in 2008. In the subsequent analysis, we use the 130% line as a representative criterion for determining the poverty status (in practice, a level between 100 and 200% of the guideline is typically used to determine the eligibility for various federal and state programs).

Table 1 Poverty Rates by Year.

Year	130 percent of federal poverty guidelines
2003	17.6
2004	19.2
2005	19.5
2006	19.4
2007	18.1
2008	18.7
2009	18.9
2010	20.9
2011	21.9
2012	22.5

Source: Author's calculations using federal poverty guidelines from the federal registry.
Note: Survey weights are applied.

We evaluate the changes in the unpaid work time along the business cycle by separating 2003 – 2012 into three periods: pre-recession (January 2003 – November 2007), recession (December 2007 – June 2009), and post-recession (July 2009 – December 2012), consistent with the NBER recession dating (NBER, 2010). We then evaluate the changes that take place between pre-recession and recession periods, and recession and post-recession periods, and split the sample into four groups: poor and nonpoor females and poor and nonpoor males.

The dependent variable is weekly minutes spent on unpaid work. Unpaid work activities are associated with household production for own consumption and include cooking, cleaning, shopping, household management, repair and lawn care, and caring for children and others.

[3] We assess the sensitivity of our results to this particular classification of poor and nonpoor individuals by assigning to the poor group only those individuals whose income lies below the income category that nests the poverty threshold. In this alternative classification, some poor individuals are classified as nonpoor. We find that our results are robust to the alternative classification.

These activities are classified as unpaid work based on the third-party principle and include activities that individuals are not paid for but could pay a third party to perform (Berik and Kongar 2013). In establishing the presence of the changes in unpaid work time by poverty and gender, we also consider a more detailed breakdown of unpaid work-time activities by evaluating routine tasks, maintenance tasks and care (see Appendix for exact definitions). Routine activities include cooking, cleaning, laundry, shopping and household management. Maintenance activities include repair of household structures, appliance, vehicle, toys, and lawn care. Care activities are defined as caring for and helping children and elderly with daily tasks as primary activities. We further separate care activities into childcare and care for other household members, taking into account that child care has been shown to follow patterns different from other household production activities, in part because childcare contains an investment component (Guryan et al. 2008; Kimmel and Connely 2007).

During 2003 – 2012, poor women spent 1,952 minutes (32.5 hours) and nonpoor women spent 1,787 minutes (29.8 hours) on unpaid work time per week. Poor men spent 1,080 minutes (18 hours) and nonpoor men spent 1,109 minutes (18.5 hours) on unpaid work time. The gender differences are statistically significant at 1% and confirm that women spend more than 50% more time on unpaid work than men do. The results also indicate that poor women in the United States spend more time on unpaid work time and this difference is statistically significant at 1%. Although poor men spend less time than their nonpoor counterparts, the difference is not statistically significant.

The explanatory variables in our estimation include the number of children in the household; the number of adults in the household; race, with white as the base; age of the respondent; education, indicating the highest level of schooling completed, with high school education or less as the base; own labor force status, with full-time wage worker status as the base; labor force status of the partner, with single respondent as the base; a dummy variable for weekends and holidays; and a dummy variable for the summer months. We account for macroeconomic variations using seasonally adjusted monthly state unemployment rates and regional indicators.

Table 2 reveals that during 2003 – 2012, demographic and socioeconomic characteristics of households experienced shifts observed in the data. Some of the most notable changes took place in the form of worsening labor force composition. In particular, the proportion of unemployed increased and the proportion of full-time wage workers decreased for all four

groups although for nonpoor women the proportion of full-time wage workers in fact increased between pre-recession and recession periods, before dropping after the recession. The proportion of unemployed among the poor increased more sharply than it did among the nonpoor, potentially due to the higher likelihood of the poor losing jobs or due to the nonpoor moving into poverty after losing a job. Shifts similar to the ones that occurred in the own labor force composition also took place in the labor force composition of spouses, as the proportion of employed spouses declined for all four groups, with the exception of poor males after the recession.

Important shifts also occurred in the household composition. In line with the long-term trend in the structure of U.S. households, the proportion of single individuals increased for all four groups between pre-recession and recession periods, but veered off the trend and decreased during the post-recession period (Vespa, Lewis, and Kreider 2013). Consistent with these changes, between pre-recession and recession periods, the proportion of households with three or more adults decreased in all groups but poor females; however during the post-recession period, we observe a considerable spike for all four groups. These post-recession shifts, likely induced by the recession, are also confirmed by the Census data (U.S. Census Bureau 2012), which documents an increase in the proportion of individuals more than 18 years old in US households after 2008. This finding has been attributed to adult children moving in with their parents and/or elderly parents moving in with their children. Taylor et al. (2011) report that, whereas the number of people living in multigenerational households increased by about 2% per year since 1980, between 2007 and 2009, this number jumped by over 16%. Furthermore, Elliott, et al. (2011) observe a rise in the complexity of the family structure during the Great Recession due to the growing incidence of members who are not a spouse or own children of the householder, possibly due to the mergers of different households with children. Consistent with Elliot et al. (2011), in our sample, this compositional change appears to be more substantial among poor households. We note that this finding could be attributed to the greater likelihood of poor households merging as well as to the merged households having a greater likelihood of being categorized as poor.

In line with long-term trends, the proportion of households with two or more children decreased throughout the three periods, but only in nonpoor households. In poor households, on the other hand, we observe an increase in this number between pre-recession and recession periods, followed by a drop between recession and post-recession periods, potentially revealing

the greater sensitivity of poor households to economic shocks. It is plausible that the temporary merging of multiple households due to economic reasons lies behind the initial increase. In turn, the post-recession decrease may signify the reversal of these nontraditional household arrangements. Other notable changes during 2003-2012 include population becoming older and more educated (Table 2). Finally, the mean state-level unemployment rates during pre-recession, recession, and post-recession periods were 5.24%, 6.81% and 8.97%, respectively (the decline that started in 2010 was not yet reflected in the post-recession average).

Table 2 Descriptive Statistics of Variables (Proportions).

	Poor female			Nonpoor female			Poor male			Nonpoor male		
	Jan 03 – June 07	July 07 – Dec 09	Jan 10 – Dec 12	Jan 03 – june 07	July 07 – Dec 09	Jan 10 – Dec 12	Jan 03 – June 07	July 07 – Dec 09	Jan 10 – Dec 12	Jan 03 – June 07	July 07 – Dec 09	Jan 10 – Dec 12
Number of children												
0	0.365	0.39	0.387	0.555	0.563	0.588	0.486	0.461	0.525	0.586	0.609	0.616
1	0.203	0.174	0.197	0.197	0.198	0.189	0.158	0.142	0.147	0.181	0.164	0.172
2 or more	0.432	0.436	0.416	0.248	0.239	0.223	0.356	0.397	0.328	0.233	0.227	0.212
Number of adults												
1	0.282	0.285	0.26	0.134	0.146	0.141	0.166	0.192	0.188	0.13	0.142	0.137
2	0.466	0.423	0.427	0.612	0.604	0.576	0.523	0.511	0.45	0.582	0.594	0.545
3 or more	0.252	0.292	0.313	0.254	0.25	0.283	0.311	0.297	0.362	0.288	0.264	0.318
Age												
18-24	0.24	0.221	0.214	0.121	0.118	0.123	0.255	0.205	0.229	0.127	0.136	0.133
25-44	0.464	0.472	0.458	0.452	0.427	0.407	0.474	0.463	0.42	0.457	0.443	0.423
45-65	0.297	0.307	0.327	0.427	0.455	0.471	0.272	0.332	0.351	0.416	0.421	0.443
Non-white												
1	0.295	0.293	0.304	0.146	0.161	0.171	0.25	0.237	0.255	0.141	0.14	0.162
Work												
Full-time wage worker	0.274	0.261	0.227	0.533	0.541	0.522	0.485	0.44	0.387	0.703	0.693	0.652
Part-time wage worker	0.204	0.186	0.177	0.161	0.159	0.165	0.121	0.108	0.115	0.061	0.067	0.075
Full-time self-employed	0.014	0.015	0.02	0.033	0.034	0.03	0.054	0.074	0.053	0.085	0.084	0.078
Part-time self-employed	0.014	0.013	0.02	0.028	0.03	0.027	0.021	0.025	0.035	0.017	0.019	0.017
Unemployed	0.089	0.105	0.138	0.033	0.047	0.05	0.082	0.109	0.154	0.039	0.048	0.066
Not in the labor force	0.404	0.42	0.418	0.213	0.19	0.206	0.237	0.245	0.256	0.095	0.089	0.112
Spouse's employment status												
Not married	0.64	0.659	0.671	0.365	0.384	0.409	0.592	0.581	0.605	0.395	0.424	0.445
Spouse employed	0.255	0.226	0.207	0.546	0.524	0.483	0.158	0.133	0.148	0.424	0.404	0.38
Spouse not-employed	0.105	0.115	0.121	0.089	0.092	0.108	0.25	0.286	0.247	0.182	0.173	0.174
Highest education												
HS or less	0.683	0.661	0.637	0.346	0.314	0.303	0.708	0.713	0.684	0.397	0.376	0.378
Some college	0.248	0.251	0.267	0.306	0.308	0.307	0.208	0.218	0.218	0.277	0.275	0.274
College degree	0.054	0.071	0.075	0.232	0.254	0.252	0.067	0.045	0.071	0.211	0.22	0.226
Post-graduate education	0.015	0.017	0.022	0.116	0.125	0.138	0.017	0.023	0.027	0.116	0.129	0.121
Region												
Northeast	0.13	0.129	0.146	0.181	0.177	0.182	0.13	0.119	0.131	0.182	0.192	0.193
Midwest	0.219	0.208	0.224	0.254	0.256	0.236	0.206	0.2	0.219	0.258	0.231	0.238
South	0.425	0.447	0.412	0.336	0.342	0.352	0.393	0.405	0.421	0.327	0.342	0.341
West	0.227	0.216	0.219	0.229	0.225	0.23	0.271	0.277	0.229	0.233	0.235	0.228
Offday												
1	0.293	0.315	0.292	0.301	0.301	0.3	0.306	0.294	0.314	0.296	0.308	0.294
Summer												
1	0.255	0.251	0.266	0.257	0.219	0.261	0.254	0.213	0.25	0.242	0.211	0.273

Notes: weighted proportions.

We decompose the unpaid work time of poor and nonpoor men and women separately using the Oaxaca-Blinder decomposition (Oaxaca 1973; Blinder 1973). We use the Ordinary Least Square (OLS) method, shown in this case to be a preferred approach over limited dependent variable methods, such as Tobit (Stewart 2009).

Let $Y_{g,t}$ represent the unpaid work time of group *g* at point *t*, where $g \in$ (poor females, nonpoor females, poor males, nonpoor males). Using the OLS specification, we estimate a linear model $Y_{g,t} = X'_{g,t}\beta_{g,t} + \varepsilon_{g,t}$, where $X_{g,t}$ is the vector of explanatory variables, $\beta_{g,t}$ is the vector of coefficients and $\varepsilon_{g,t}$ is the error term, such that $E(\varepsilon_{g,t}) = 0$.

The change in the mean values of the unpaid work time between points *t* and *t+1*, $E(Y_{g,t})$ and $E(Y_{g,t+1})$, can be expressed as:

$$R = E(Y_{g,t+1}) - E(Y_{g,t}) = E(X_{g,t+1})'\beta_{g,t+1} - E(X_{g,t})'\beta_{g,t},$$

since $E(Y_{g,t}) = E(X'_{g,t}\beta_{g,t} + \varepsilon_{g,t}) = E(X'_{g,t}\beta_{g,t}) + E(\varepsilon_{g,t}) = E(X_{g,t})'\beta_{g,t}$.

The two-fold decomposition of this difference can then be expressed as:

$$R = [E(X_{g,t+1}) - E(X_{g,t})]'\beta^* + [E(X_{g,t+1})'(\beta_{g,t+1} - \beta^*) + E(X_{g,t})'(\beta^* - \beta_{g,t})],$$

where β^* is commonly referred to as the nondiscriminatory coefficients vector. In our case, β^* represents the coefficient vector from a pooled regression with the time dummy for period t+1. In this decomposition, the first component, $[E(X_{g,t+1}) - E(X_{g,t})]'\beta^*$, represents the portion of the total difference due to the changes in the explanatory variables and is commonly referred to as the explained component. The second component, $[E(X_{g,t+1})'(\beta_{g,t+1} - \beta^*) + E(X_{g,t})'(\beta^* - \beta_{g,t})]$, represents the portion of the total difference due to the changes in the coefficients and is commonly referred to as the unexplained component.

4. RESULTS

4.1 Changes in the Unpaid Work Time over the Business Cycle

Before conducting the decompositions, we first establish the presence of the changes in the unpaid work time of men and women that took place between pre-recession and recession periods, and between recession and post-recession periods. Table 3 indicates that the unpaid work time of *women* in our sample decreased between the pre-recession and recession periods, a finding which is consistent with other studies (Berik and Kongar 2013). Furthermore, the decrease in their unpaid time use continued after the recession into 2012.[4] For men, we do not observe statistically significant changes during the two time segments.

A fuller picture comes into focus once we break down the sample by poverty status. Doing so reveals that the pre-recession/recession and recession/post-recession contractions in women's unpaid work time were driven by nonpoor women because poor women's unpaid work did not change statistically significantly. On the other hand, the lack of a change in men' s unpaid work between the pre-recession and recession periods masked the decrease in nonpoor men's unpaid work and the increase in poor men's unpaid work. These findings demonstrate that the changes in unpaid work time indeed depend on the poverty status, motivating our investigation of the forces that underlie them.

Evaluating these changes in the context of the activities in which they took place, we find that between pre-recession and recession periods, the reduction in nonpoor women and men's unpaid work took place primarily in maintenance activities whereas the increase in poor men's unpaid work occurred primarily in routine activities and childcare (in *other care,* poor men decreased their time use), in line with findings from other studies (Morrill and Pabilonia 2012; Hartmann et al. 2010). Hence, poor men increased their time spent on activities needed on a daily basis, whereas the reductions appear to have taken place in the maintenance activities which may be viewed as less urgent. After the recession, the drop in nonpoor women's unpaid work continued, however this time in routine and childcare activities. This may indicate that as labor market conditions continued deteriorating, nonpoor women tapped into their routine activities and even childcare to make the necessary time use adjustments. It is also notable that after the recession poor men reduced their time spent on childcare activities, echoing findings

[4] Using a sample of married women only (which also excludes self-employed individuals), Berik and Kongar (2013) report an upward reversal in women's unpaid work time by 2010. Employing their sample restrictions and updating the data to 2012, we find that the reductions in married women's unpaid work time continued although they were not statistically significant.

from other studies (Berik and Kongar 2013). However, this decrease was not enough to lower their total unpaid work, at least in part because they also increased their time use on other care.

Table 3 Changes in Unpaid Work Time, 2003 - 2012 (in Weekly Minutes).

VARIABLES	Unpaid work w/o trend	Routine	Maintenance	Childcare	Other care
	(1)	(2)	(3)	(4)	(5)
FEMALE					
Recession/pre-recession	-57.50**	-21.52	-21.44***	-6.077	-8.465
	(25.19)	(19.37)	(5.546)	(9.651)	(8.690)
Post-recession/recession	-84.11***	-49.74**	3.392	-23.96**	-13.80
	(26.31)	(20.22)	(5.858)	(10.09)	(8.999)
Constant	1,886***	1,289***	102.4***	319.9***	175.1***
	(11.61)	(8.845)	(2.919)	(4.624)	(3.920)
Observations	53,969	53,969	53,969	53,969	53,969
POOR FEMALE					
Recession/pre-recession	-73.21	-41.57	-7.887	6.322	-30.08
	(59.47)	(43.82)	(13.48)	(25.29)	(19.59)
Post-recession/recession	-6.466	17.54	4.122	-11.38	-16.76
	(60.95)	(45.37)	(14.64)	(25.99)	(18.49)
Constant	1,996***	1,327***	71.35***	396.8***	201.0***
	(27.27)	(20.07)	(5.315)	(11.47)	(10.99)
Observations	11,984	11,984	11,984	11,984	11,984
NONPOOR FEMALE					
Recession/pre-recession	-54.21*	-16.53	-24.77***	-9.934	-2.971
	(27.68)	(21.58)	(6.039)	(10.15)	(9.697)
Post-recession/recession	-110.4***	-70.36***	3.769	-30.72***	-13.07
	(29.01)	(22.55)	(6.315)	(10.62)	(10.29)
Constant	1,858***	1,279***	110.4***	300.2***	168.5***
	(12.78)	(9.849)	(3.402)	(4.990)	(4.032)
Observations	41,985	41,985	41,985	41,985	41,985
MALE					
Recession/pre-recession	-18.14	-1.273	-22.31*	21.24**	-15.80**
	(23.09)	(14.40)	(12.54)	(8.633)	(6.964)
Post-recession/recession	-24.27	11.61	-16.84	-18.29**	-0.758
	(23.85)	(15.11)	(12.66)	(9.022)	(7.087)
Constant	1,123***	611.3***	249.8***	136.4***	125.2***
	(10.63)	(6.962)	(6.060)	(2.975)	(3.937)
Observations	43,095	43,095	43,095	43,095	43,095
POOR MEN					
Recession/pre-recession	123.0*	71.46*	-4.759	102.1***	-45.74***
	(69.57)	(41.62)	(25.18)	(36.77)	(15.97)
Post-recession/recession	-42.81	-11.63	3.930	-69.90*	34.79**
	(70.99)	(42.75)	(25.43)	(37.92)	(15.82)
Constant	1,029***	565.0***	190.2***	133.9***	139.6***
	(25.45)	(16.91)	(12.49)	(7.956)	(11.20)
Observations	7,250	7,250	7,250	7,250	7,250
NONPOOR MEN					
Recession/pre-recession	-47.22**	-16.25	-26.06*	4.739	-9.643
	(23.86)	(15.09)	(14.19)	(7.013)	(7.720)
Post-recession/recession	-21.62	16.23	-20.22	-8.822	-8.807
	(24.73)	(15.94)	(14.35)	(7.374)	(7.866)
Constant	1,142***	620.9***	262.2***	136.9***	122.3***
	(11.69)	(7.633)	(6.832)	(3.191)	(4.147)
Observations	35,845	35,845	35,845	35,845	35,845

Notes: Standard errors in parenthesis; *** p<0.01, ** p<0.05, * p<0.1.

4.2 Regression Results

Next, we report the regression results, setting the stage for the interpretation of the Oaxaca-Blinder decompositions. Our estimations shed light on the relationship between explanatory variables and the unpaid work time. In the remainder of this section, we report the results for poor and nonpoor men and women estimated over 2003 – 2012 (Table 4).

Although the magnitudes vary, coefficient signs are shared by men and women but in some cases vary by poverty status. Own labor force status is a major determinant of unpaid work time. Predictably, part-time wage workers spend considerably more time on unpaid work than their full-time counterparts, with part-time women spending almost twice as much time relative to their full-time counterparts as part-time men do. A similar picture emerges among self-employed workers. These findings appear to indicate that working part-time is associated with greater obligation to take care of household responsibilities among women than among men. We observe that unemployed and inactive individuals behave very differently when it comes to their unpaid work. Whereas both spend more time on unpaid household activities than full-time wage workers, unemployed workers spend significantly more time on them than inactive workers for all groups except for nonpoor women, for whom the difference is not statistically significant.

Having more kids raises the amount of time spent on unpaid work and does so more for women than for men. Having an additional adult in the household, on the contrary, reduces the amount of time on unpaid work an individual spends, likely because of scale economies, although the effect for poor men is statistically insignificant. Older individuals spend more time on unpaid work, with each additional year raising the amount of time spent on unpaid work by 7-10 minutes. Educational attainment matters to the unpaid work of only nonpoor individuals, increasing with it. It is noteworthy that the dividing line appears to be high school education or less, with the differences above some college education being statistically insignificant. Nonwhite individuals spend less time on unpaid work than white individuals. Notably, for poor individuals, the racial gap in unpaid work is much higher among women than it is among men. For nonpoor individuals, on the other hand, the racial gap is similar among men and women. Marital status plays a key role as married individuals spend more time on household activities than unmarried individuals, with the marital gap in unpaid work being much wider for women than men (with poor women spending as many as 10 weekly hours more than their single

counterparts). It is also the case that married individuals with employed spouses spend more time on unpaid work than married individuals with not-employed[5] spouses.

Table 4 Regression Results, 2003 – 2012.

	Male		Female	
	Poor	Nonpoor	Poor	Nonpoor
No of kids	125.3***	147.5***	301.4***	344.6***
	(18.60)	(8.055)	(14.41)	(8.696)
No of adults	-34.30	-70.40***	-125.0***	-85.86***
	(21.55)	(11.25)	(17.98)	(12.22)
Age	6.696***	7.078***	7.820***	9.652***
	(1.435)	(0.753)	(1.422)	(0.706)
Non-white	-121.1***	-113.1***	-297.9***	-142.2***
	(40.73)	(20.69)	(37.28)	(21.30)
Day off	212.0***	506.1***	-183.5***	288.8***
	(34.66)	(15.74)	(30.68)	(15.65)
Summer	-56.76	27.44	-124.2***	10.91
	(39.42)	(17.90)	(39.50)	(18.12)
UR	10.48	5.182	-17.97	1.774
	(12.07)	(5.240)	(11.22)	(5.401)
Part-time wage worker[a]	154.3***	96.37**	294.9***	321.0***
	(57.72)	(37.90)	(48.23)	(22.71)
Full-time self-employed	11.73	-139.3***	142.5	-78.91*
	(76.13)	(28.92)	(107.7)	(44.55)
Part-time self-employed	314.0***	329.7***	528.9***	612.1***
	(84.67)	(70.56)	(103.3)	(52.41)
Unemployed	727.5***	665.6***	941.0***	882.3***
	(74.60)	(47.13)	(58.63)	(53.52)
Inactive	278.5***	465.6***	700.1***	952.9***
	(45.94)	(33.80)	(42.20)	(22.86)
Some college[b]	-6.211	69.39***	23.68	23.66
	(42.12)	(20.85)	(38.89)	(21.18)
College degree	21.84	97.93***	28.78	86.94***
	(58.77)	(20.30)	(65.98)	(21.56)
Post graduate education	-39.01	61.82***	179.8*	77.95***
	(80.19)	(23.07)	(105.1)	(25.60)
Employed spouse[c]	343.4***	243.9***	640.7***	448.0***
	(61.07)	(20.33)	(45.96)	(18.83)
Not-employed spouse	135.8***	126.7***	367.5***	201.4***
	(47.21)	(25.02)	(61.43)	(32.11)
Midwest[d]	194.8***	74.43***	-35.02	-41.61*
	(60.84)	(23.32)	(56.38)	(24.20)
South	81.93	-26.81	-15.19	-55.07**
	(53.58)	(22.01)	(51.09)	(23.07)
West	90.02	11.03	38.21	-39.61
	(60.87)	(24.03)	(57.63)	(25.14)
Recession[e]	74.77	-54.08**	-41.35	-37.61
	(70.45)	(24.32)	(55.60)	(25.65)
Post-recession	-20.88	-89.54***	-18.60	-141.2***
	(56.18)	(25.58)	(55.60)	(26.01)
Constant	310.0***	474.4***	1,163***	736.3***
	(105.7)	(51.57)	(108.5)	(57.19)
Observations	19,125	76,866	19,083	77,028
R-squared	0.083	0.104	0.210	0.226

Notes: [a] full-time wage worker is the base; [b] high school education or less is the base; [c] single is the base; [d] Northeast is the base; [e] pre-recession is the base.

[5] "Not employed" includes both unemployed persons, as well as those who are inactive (not looking for work).

4.3 Decomposition

In this section, we present the main results of the paper. The decompositions highlight the importance of the shifts in individual and household characteristics and of the adjustments in unpaid work time—conditional on these characteristics—in explaining the changes in the unpaid work time of individuals by gender and poverty status.

Men

Between pre-recession and recession periods, *poor* men increased their unpaid work time by almost 2.5 hours a week (146 minutes), as shown in Table 5. The worsening of the employment situation raised their unpaid work time by 22 minutes, as the proportion of unemployed increased relative to full-time wage workers. This finding confirms that the weakening of the employment composition was indeed associated with unpaid work-time changes between these two periods (Berik and Kongar 2011). In addition to these changes, however, additional upward pressure on poor men's unpaid work time was placed by the shifts in household composition and by their aging. In particular, the increase in the average number of children in the household added 22 minutes to poor men's unpaid work, and becoming older contributed another 13 minutes. Hence, these three compositional changes jointly contributed 57 minutes to the increase in poor men's unpaid work time.

A look at the unexplained portion of the gap sheds light on the adjustments made by different categories of poor men. For example, part-time self-employed poor men increased their unpaid work relative to full-time wage workers by 16 minutes, possibly due to the greater flexibility afforded by their status. Furthermore, poor men with not-employed spouses increased their unpaid work relative to single poor men by 67 minutes during the recession, possibly due to the stronger financial pressure to substitute household goods for market goods. This finding also underscores that the ultimate increase in the unpaid work of poor men was led by married men.

In contrast to the poor men's increase, *nonpoor* men's unpaid work between pre-recession and recession periods contracted by 47 minutes per week. We note that, similar to poor men, the worsening of nonpoor men's employment situation placed upward pressure on their unpaid work time although at 7 minutes, the increase was of a smaller magnitude. However, other compositional changes negated this increase. In particular, the decrease in the average

number of children observed in nonpoor households resulted in the reduction of about 7 minutes in nonpoor men's unpaid work. Furthermore, a decrease in the proportion of nonpoor men with employed spouses resulted in a moderate 4-minute reduction in nonpoor men's unpaid work time because nonpoor men with employed spouses do more unpaid work than their single counterparts. Taken together, the compositional changes only minimally explain the reduction in the unpaid work time of nonpoor men.

Most of the change in the unpaid work time of nonpoor men between pre-recession and recession periods remains unexplained. In fact, the unexplained portion contributes 58 minutes to the 47-minute reduction in nonpoor men's unpaid work-time change, suggesting adjustments in the behavior were the primary reason behind the changes in nonpoor men's unpaid work time. The differences in the adjustments that several categories of nonpoor men made illuminate some of the hidden forces behind them. For example, we find that nonpoor men with above-college education increased their unpaid work time relative to their counterparts with high school education or less by 14 minutes. It could hence be argued that it was the less educated who were behind the reductions in the unpaid work time of nonpoor men. Moreover, unemployed nonpoor men reduced their unpaid work time relative to full-time wage workers by 12 minutes, suggesting that, although they still spend more time on unpaid work time than full-time wage workers, the distance between the two groups contracted. Ultimately, however, it was nonpoor men's reallocation of time during the week and throughout the year that contributed the most to the contraction in their unpaid work time between the pre-recession and recession periods. More specifically, during the recession nonpoor men reduced the unpaid work time on their days off relative to their working days by 33 minutes. They also made seasonal adjustments to their time use, reducing their summer unpaid activities by 21 minutes compared to the rest of the year. Hence, it appears that the bulk of the change in nonpoor men's unpaid work time was caused by the reductions in maintenance activities during the off-days and summer months.

Between recession and post-recession periods, changes in the unpaid work-time of both poor and nonpoor men were not statistically significant although this did not mean that no changes took place, only that different forces counteracted each other (Table 5). For both groups, the unemployment situation continued worsening as the proportion of unemployed increased relative to full-time wage workers, resulting in a 33-minute increase for poor men and an 11-minute increase for nonpoor men. In addition, in the case of nonpoor men, the increase in the proportion of inactive individuals contributed another 11 minutes to the increase in their unpaid

work. Hence, after the recession, poor labor market environment continued placing upward pressure on men's unpaid work time.

These increases were counteracted by shifts in other characteristics. In the case of poor men, these shifts entailed the reduction in the average number of children in poor households in the reversal of the pre-recession/recession changes, which contracted their unpaid work-time by 31 minutes. In the case of nonpoor men, the counteracting force took the form of the post-recession increase in the number of adults, which reduced nonpoor men's unpaid work-time by 6 minutes. In addition, the continued reduction in the proportion of nonpoor men with employed spouses pushed down their unpaid work time by another 6 minutes.

Once again, additional insights can be gained by evaluating the unexplained portion of the changes in the unpaid work time, especially of poor men. In their case, part-time wage workers increased their unpaid work time by 32 minutes, whereas part-time self-employed workers reduced it by 19 minutes, both relative to full-time wage male workers. This finding highlights that poor men's adjustments were sensitive to their employment status. Moreover, for each additional adult, poor men spend 438 minutes less post-recession period compared to the recession period. Among nonpoor men, there is no evidence of substantial shifts in the adjustments of different categories between recession and post-recession periods.

Table 5 Oaxaca-Blinder Decomposition for Men.

	Pre-recession / Recession				Recession / Post-recession			
	Poor		nonpoor		Poor		nonpoor	
	E	U	E	U	E	U	E	U
No of kids	21.52*	48.08	-7.116**	8.544	-30.58**	-34.70	-2.547	-1.785
	(12.18)	(80.74)	(2.880)	(16.75)	(13.41)	(80.82)	(3.107)	(17.22)
No of adults	-0.316	312.2	2.480	47.97	-5.990	-437.9*	-6.325***	-53.99
	(2.165)	(236.2)	(1.706)	(72.43)	(5.483)	(239.2)	(2.198)	(70.42)
Age	12.50**	-248.0	0.524	84.91	2.365	90.90	3.488	-100.4
	(5.798)	(169.4)	(2.280)	(88.60)	(3.262)	(173.3)	(2.406)	(90.80)
Non-white	1.498	23.26	0.247	0.242	-1.639	-8.866	-2.850**	-6.742
	(3.014)	(31.16)	(0.682)	(8.440)	(2.202)	(31.77)	(1.159)	(8.871)
Day off	-1.684	-28.60	6.622	-33.31**	2.373	-13.45	-6.693*	0.310
	(4.990)	(34.44)	(4.555)	(13.90)	(3.128)	(35.45)	(4.068)	(14.30)
Summer	3.473	-9.076	-1.266	-20.71*	-2.083	16.23	-0.364	7.545
	(2.645)	(26.42)	(0.780)	(11.15)	(2.335)	(27.17)	(1.468)	(11.75)
UR	-15.83	-58.56	10.96	-33.03	28.42	320.4	7.864	-6.483
	(26.14)	(211.9)	(11.43)	(88.48)	(31.99)	(228.1)	(13.95)	(97.85)
PT wage worker[a]	-1.344	-27.05	0.844	-11.25	0.767	32.18*	0.281	3.311
	(2.141)	(19.66)	(0.853)	(7.456)	(2.280)	(19.42)	(0.426)	(7.424)
FT self-employed	0.480	1.665	0.193	-0.312	0.102	-3.057	0.774	2.574
	(2.296)	(14.32)	(0.907)	(6.308)	(2.507)	(14.97)	(0.847)	(6.231)
PT self-employed	1.516	16.03**	0.769	1.102	3.443	-18.66**	-0.746	0.473
	(2.665)	(7.518)	(0.866)	(3.943)	(2.587)	(8.529)	(1.095)	(4.279)
Unemployed	21.84*	-11.95	6.768**	-12.05*	33.22**	11.08	10.88***	2.322
	(12.50)	(24.91)	(3.413)	(6.602)	(13.28)	(27.78)	(3.282)	(7.157)
Inactive	2.465	7.478	-3.017	-7.007	2.171	0.901	10.68***	8.583
	(5.144)	(36.43)	(2.847)	(9.574)	(5.610)	(38.16)	(3.313)	(10.23)
Some college[b]	0.0759	24.76	-0.0627	18.10	-0.00227	-30.32	-0.228	-22.97
	(0.570)	(30.58)	(0.790)	(17.01)	(0.0729)	(31.40)	(0.748)	(17.45)
College	0.217	1.673	0.853	-9.590	1.345	2.603	0.616	6.821
	(1.433)	(8.642)	(0.832)	(12.13)	(2.193)	(9.374)	(0.787)	(12.85)
Post-grad	0.441	3.266	0.431	14.34*	-0.307	-8.903	-0.487	-5.452
	(0.839)	(5.770)	(0.391)	(8.706)	(0.759)	(6.358)	(0.679)	(9.206)
Employed spouse[c]	-7.895	40.87	-4.361*	11.74	5.832	-24.83	-6.330**	13.23
	(5.686)	(31.50)	(2.366)	(23.95)	(7.003)	(31.98)	(3.013)	(24.09)
Not-employed spouse	2.514	66.78*	-1.281	-19.09	-9.098	-6.829	0.150	9.520
	(2.618)	(40.12)	(1.068)	(12.30)	(5.924)	(41.88)	(0.736)	(12.48)
Midwest[d]	-2.037	32.21	-1.161	1.002	4.068	-56.29	0.507	16.22
	(5.123)	(37.10)	(0.866)	(16.98)	(3.890)	(38.51)	(0.936)	(17.09)
South	1.278	17.40	-0.848	-9.526	0.742	-74.58	-0.00366	34.65
	(3.483)	(64.32)	(0.723)	(21.79)	(1.700)	(67.52)	(0.0689)	(22.51)
West	1.177	40.47	-0.0159	23.09	-4.695	-56.59	-0.413	-1.206
	(2.856)	(53.47)	(0.143)	(17.50)	(5.268)	(53.29)	(0.598)	(18.18)
Total	41.89	104.3	11.56	-58.43**	30.45	-92.20	8.257	-26.69
	(31.81)	(69.68)	(14.70)	(25.59)	(39.14)	(66.61)	(16.90)	(26.91)
Prediction_bef	1,169***		1,087***		1,107***		1,069***	
	(61.67)		(21.38)		(29.03)		(13.68)	
Prediction_aft	1,023***		1,134***		1,169***		1,087***	
	(25.24)		(12.03)		(61.67)		(21.38)	
Difference	146.2**		-46.87*		-61.74		-18.43	
	(66.64)		(24.53)		(68.16)		(25.38)	
Constant		-148.5		-113.6		208.5		66.73
		(339.4)		(154.5)		(349.9)		(160.8)
Observations	4,383	4,383	23,681	23,681	3,852	3,852	17,433	17,433

Notes: [a] full-time wage worker is the base; [b] high school education or less is the base; [c] single is the base; [d] Northeast is the base.

Women

Between pre-recession and recession periods, poor women's unpaid work did not change statistically significantly. It is noteworthy that, despite the worsening of their labor force composition, poor women's unpaid work time did not change, as was the case for poor men. The deterioration of their spousal employment picture, on the other hand, was associated with the reduction of 15 weekly minutes in their unpaid work time, possibly due to the greater sharing of household responsibilities. We can glimpse at other contributing factors by evaluating the unexplained portion of the change in poor women's unpaid work time. For example, part-time poor female wage workers increased their unpaid work time by 44 minutes relative to their full-time counterparts, possibly due to stronger financial pressure. Also, poor women with some college education increased their unpaid work by 72 minutes relative to their counterparts with high school education or less. Finally, relative to poor women in Northeast, Midwestern poor women increased their unpaid work time by 79 minutes, revealing the presence of regional variation in the adjustments. Despite these developments, the unpaid work time of poor women remained statistically unchanged between pre-recession and recession periods.

Nonpoor women, on the other hand, unequivocally reduced their unpaid work between pre-recession and recession periods, contracting it by 60 minutes. In contrast to poor women, nonpoor women's unpaid work time did change due to their worsening labor force characteristics. On the one hand, the increase in the proportion of nonpoor unemployed women relative to full-time wage worker counterparts increased their unpaid work by 13 minutes. On the other hand, a parallel decrease in the proportion of inactive nonpoor women resulted in the decrease in unpaid work of 26 minutes. Hence, the effect of the decrease in inactivity outweighed the effect of the increase in unemployment and resulted in the decrease in nonpoor women's unpaid time use. This finding lies in contrast to the more typical case, in which the worsening of own employment situation places upward pressure on the unpaid work time, as was observed in the case of men. Pushing nonpoor women's unpaid work time further down by about 10 minutes was the deterioration of the spousal employment situation, a finding shared by nonpoor and poor women. Finally, the decrease in the average number of children experienced by nonpoor households throughout 2003 – 2012 reduced nonpoor women's unpaid work by additional 11 minutes. The latter drop dominated the increase of 6 minutes due to the aging of the nonpoor female population during this period.

We single out several components of the unexplained portion of the change in the unpaid work time of nonpoor women. The amount of time full-time self-employed nonpoor women spent on unpaid activities relative to full-time wage worker women increased by 8 minutes. In addition, a 204-minute reduction was due to the slow-down in the age-related increases in the unpaid work time during this period. This implies that older nonpoor women, while still more involved in unpaid work than their younger counterparts, reduced their involvement in relative terms compared to the pre-recession times. Moreover, nonpoor women with above college education increased their unpaid time relative to their counterparts with high school education or less, in their case by a sizable 26 minutes. Hence, similar to nonpoor men, the decrease in nonpoor women's unpaid work time was likely driven by less educated individuals. Also similar to nonpoor men, nonpoor women reallocated their time throughout the year by reducing their unpaid work time during the summer months relative to the rest of the year, leading to a 23-minute drop. The latter finding shared by nonpoor men and women is also consistent with the initial finding that the reductions in their unpaid work time between pre-recession and recession periods took place in maintenance activities.

Between the recession and post-recession periods, poor women's unpaid work as a whole remained once again unchanged (Table 6). However, this time, the continued worsening of the individual employment picture manifested itself in a spike in their unpaid work time: the increase in the proportion of unemployed poor women relative to full-time wage worker counterparts was associated with a 31-minute increase in unpaid work time. Counteracting this increase, the continued rise in state-level unemployment rates was associated with a 48-minute reduction in the unpaid work of poor women, possibly due to the pressure to work more hours. We note, however, that this finding runs contrary to the finding of a positive association between unemployment rates and unpaid work time in the literature (Gimenez Nadal et al. 2010). Several shifts identifiable in the unexplained portion of the change in poor women's unpaid work time are noteworthy. Full-time self-employed poor women reduced their unpaid work time by 11 minutes, whereas part-time self-employed poor women increased it by 10 minutes, both relative to full-time wage worker counterparts. The dependence of unpaid work-time adjustments on the employment status highlights the complexity of the relationship between poverty and employment status, as we observed in the case of poor men, as well. In addition to own employment status, spousal employment status, too, played a role in the adjustments of poor women, as poor women with employed spouses increased their unpaid work time by 53

minutes, relative to their single counterparts, possibly because of the greater time pressure due to having a working spouse. Finally, poor women with some college education decreased their unpaid work time by 75 minutes relative to poor women with high school education or less, in reversal of their pre-recession/recession adjustments.

Nonpoor women's unpaid work time, on the other hand, continued contracting after the recession, shrinking by about 109 minutes. This reduction took place despite the now upward pressure placed by the continued worsening of the employment situation, as their inactivity rates increased (in contrast to the pre-recession decrease) raising their unpaid work time by 16 minutes. The changes in the characteristics that outweighed this increase were the same as during the pre-recession/recession shift, but their magnitude was larger. In particular, the post-recession reduction in the number of children lowered the unpaid work time of nonpoor women by 14 minutes and the continued reduction in the proportion of women with employed spouses decreased it by 18 minutes. Jointly, however, the explained portion of the change in nonpoor women's unpaid work time between recession and post-recession periods is minimal and almost 90% of the change is due to the adjustments that they made rather than the changes in their characteristics (97 minutes out of the observed decrease of 109 minutes).

It is noteworthy that many of the compositional changes that nonpoor women experienced between pre-recession and recession, and recession and post-recession periods were shared. On the other hand, the adjustments that nonpoor women made between recession and post-recession periods, identifiable in the unexplained part, were the opposite of their pre-recession/ recession adjustments. For example, nonpoor women increased their unpaid work during summers relative to non-summer months by 28 minutes and essentially canceling out the 23-minute decrease that took place between pre-recession and recession periods. Moreover, whereas more educated women increased their unpaid work-time relative to less educated women during the pre-recession/recession period, after the recession this change reversed as more educated nonpoor women reduced their unpaid work time relative to their counterparts with high school education or less—by 45 minutes in the case of women with some college education, 37 minutes in the case of women with completed college education and 31 minutes in the case of women with above college education. Hence, after the recession, the contraction was likely driven by the more educated women. We hypothesize that some of these shifts are linked to the types of unpaid work activities, as the initial findings indicated that the post-recession decrease of nonpoor women took place mostly in routine and childcare activities. Finally,

although still spending more time on unpaid work, inactive nonpoor women reduced their unpaid work time by 28 minutes relative to their full-time wage worker females.

Table 6 Oaxaca-Blinder Decomposition for Women.

	Pre-recession / Recession				Recesiion / Post-recession			
	poor		nonpoor		poor		nonpoor	
	E	U	E	U	E	U	E	U
No of kids	-3.156	25.00	-10.69*	-21.33	-6.971	-35.38	-13.86**	18.45
	(18.02)	(66.36)	(6.467)	(19.92)	(18.30)	(66.81)	(6.701)	(20.46)
No of adults	-11.03	76.27	1.433	38.76	-6.597	-45.74	-4.910**	-42.79
	(7.802)	(133.7)	(1.724)	(91.41)	(7.272)	(132.2)	(2.131)	(95.78)
Age	1.842	57.77	5.790*	-203.6**	6.481	142.7	3.600	77.95
	(3.002)	(153.4)	(2.973)	(88.19)	(5.453)	(158.4)	(2.494)	(91.75)
Non-white	1.085	-3.372	-2.328**	-13.49	-3.202	13.15	-1.249	7.797
	(5.330)	(33.38)	(1.060)	(10.32)	(5.163)	(34.21)	(1.242)	(10.93)
Day off	-3.915	23.89	0.378	9.318	4.136	-27.38	-0.674	-12.81
	(2.823)	(28.08)	(2.295)	(14.32)	(2.994)	(29.07)	(2.397)	(15.04)
Summer	0.227	23.27	0.290	-22.68*	-1.301	-27.08	0.277	28.03**
	(1.829)	(32.88)	(0.862)	(12.50)	(2.135)	(33.82)	(1.104)	(13.15)
UR	-24.83	-239.6	-2.288	-97.87	-48.43*	167.7	-1.243	100.3
	(23.96)	(179.7)	(11.12)	(85.22)	(28.49)	(201.5)	(14.43)	(99.65)
PT wage worker[a]	-3.992	43.87*	-0.712	5.210	-4.396	-6.506	1.873	-8.865
	(4.097)	(26.47)	(2.506)	(11.23)	(6.407)	(26.38)	(2.596)	(11.82)
FT self-employed	0.370	4.803	-0.0293	7.935*	0.419	-10.39*	0.0147	-3.948
	(1.140)	(5.411)	(0.344)	(4.562)	(0.759)	(5.963)	(0.188)	(4.787)
PT self-employed	-0.406	-4.542	0.391	-3.778	4.917*	10.96**	-1.279	3.678
	(1.026)	(4.002)	(1.836)	(4.528)	(2.870)	(4.816)	(1.902)	(4.835)
Unemployed	15.15	7.235	12.96***	12.10	31.08**	-7.587	2.834	-10.44
	(11.53)	(20.29)	(4.446)	(7.466)	(12.71)	(22.52)	(4.914)	(8.530)
Inactive	11.17	4.331	-25.86***	-10.77	-0.635	-67.54	15.67**	-26.03*
	(14.76)	(53.72)	(7.671)	(13.75)	(12.93)	(56.72)	(7.007)	(14.31)
Some college[b]	0.321	72.30**	0.223	19.00	0.867	-74.95**	-0.00137	-45.37**
	(0.940)	(31.48)	(0.559)	(20.22)	(1.243)	(32.59)	(0.0314)	(21.56)
College	1.644	-5.079	2.504**	16.27	-0.232	-9.959	-0.0771	-36.75**
	(1.823)	(13.31)	(1.137)	(15.69)	(0.630)	(13.62)	(0.598)	(17.03)
Post-grad	0.227	5.239	1.074	25.78**	1.097	-2.778	1.121	-31.41***
	(0.593)	(5.688)	(0.724)	(10.34)	(1.366)	(6.261)	(0.743)	(11.22)
Employed spouse[c]	-15.81*	-3.497	-9.768**	-34.92	-13.77	52.58*	-18.07***	51.95*
	(9.147)	(32.79)	(4.316)	(30.21)	(11.68)	(31.75)	(4.912)	(30.83)
Not-employed spouse	2.653	4.612	0.599	3.799	3.033	21.19	3.582**	1.421
	(3.814)	(23.26)	(1.024)	(9.521)	(6.159)	(24.29)	(1.556)	(10.14)
Midwest[d]	0.903	78.97**	-0.131	-13.68	1.107	-30.05	0.822	21.22
	(1.615)	(36.59)	(0.491)	(19.83)	(1.649)	(37.43)	(0.808)	(20.22)
South	-1.540	95.51	-0.436	-5.913	-2.246	-12.27	-0.389	29.85
	(1.986)	(67.87)	(0.800)	(25.25)	(2.702)	(68.44)	(0.511)	(26.62)
West	-0.434	51.61	0.207	1.420	0.265	-42.55	-0.0961	10.87
	(1.027)	(37.09)	(0.506)	(18.08)	(1.208)	(37.88)	(0.253)	(19.22)
Total	-29.53	-48.25	-26.39	-33.70	-34.38	31.49	-12.06	-96.87***
	(36.65)	(57.38)	(17.60)	(26.43)	(40.54)	(62.05)	(19.95)	(29.17)
Prediction_bef	1,908***		1,793***		1,905***		1,684***	
	(52.39)		(24.44)		(30.38)		(15.34)	
Prediction_aft	1,985***		1,853***		1,908***		1,793***	
	(27.30)		(12.64)		(52.39)		(24.44)	
Difference	-77.78		-60.08**		-2.896		-108.9***	
	(59.08)		(27.52)		(60.56)		(28.85)	
Constant		-366.8		254.8		23.31		-229.9
		(346.5)		(169.9)		(363.0)		(180.4)
Observations	7,560	7,560	28,047	28,047	6,105	6,105	19,970	19,970

Notes: [a] full-time wage worker is the base; [b] high school education or less is the base; [c] single is the base; [d] Northeast is the base.

Interpretation of the Decomposition Results

The decomposition results reveal that the changes in the unpaid work time of poor and nonpoor individuals during 2003-2012 were in part driven by the changing individual and household characteristics. Consistent with other evidence (Aguiar et al. 2013; Berik and Kongar 2011), the worsening of the employment situation had a powerful effect on the unpaid work time of men and women, but in most cases by raising it. As such, it played a considerable role in explaining the rise in poor men's unpaid work time between pre-recession and recession periods and in reducing the magnitude of the contractions in the unpaid work of nonpoor men and women observed between pre-recession and recession periods. One exception is nonpoor women between the pre-recession and recession periods, for whom the worsening of the employment situation manifested itself in the drop in their inactivity rate that lowered (rather than increased) their unpaid work time, possibly due to the female added worker effect (Şahin et al. 2010). Even in that case, however, the rise in the inactivity rate alone was insufficient to explain the 60-minute reduction in their unpaid work time, pointing at the role of other factors. Furthermore, the role of the worsening employment conditions in lifting the unpaid work time of men and women appears to have been stronger among poor individuals than among nonpoor individuals. These findings underscore the gender- and poverty-based asymmetries in the way in which labor market outcomes influenced unpaid work time.

A channel through which the weakening of the labor market conditions placed an unequivocally downward pressure on the unpaid work time of both men and women was spousal labor force status. As the proportion of employed spouses contracted for both men and women, so did their unpaid work time, pointing at the evidence of the sharing of household responsibilities (Solaz 2005). Contributing to the gender differences in the movements of the unpaid work, this contraction was more pronounced among women than among men, likely for two reasons. First of all, the reduction in the proportion of employed spouses was slightly higher for women because job losses among male spouses were proportionately higher (Table 2). Second of all, relative to their single counterparts, married women with employed spouses spend more time on unpaid work than married men with employed spouses (Table 4). As a result, women's unpaid work time contracted more than men's. Taken together, gender differences in the employment conditions via own and spousal employment status pulled up men's unpaid work time and pushed down women's unpaid work time.

Besides the changes in the labor market conditions, however, the shifts in the household composition that took place during the Great Recession, too, were linked to the unpaid work time changes. But their role was pronounced in explaining the poverty- (rather than gender-) based variation in these changes. For example, the increase in the average household size between the pre-recession and post-recession periods that was driven by the increase in the proportion of households with 3 or more adults was higher for poor households (Elliott et al. 2011). Even so, its impact on the reduction in the unpaid work played out statistically significantly only among the nonpoor individuals, suggesting that nonpoor households are more likely to take advantage of the scale economies afforded by having more adults in the household. This finding suggests that members of nonpoor households more equally spread household responsibilities. In addition, further highlighting poverty-based differences, the average number of children in poor and nonpoor households decreased throughout this period, with the key exception of the poor households between the pre-recession and recession periods. In nonpoor households, the decrease in the average number of children was mirrored by the reduction in the unpaid work time of men and women. In poor households, on the other hand, the pre-recession/recession increase in the average number of children was paralleled by the rise in poor men's unpaid work time. After the recession, the drop in the average number of children in poor households, potentially representing the falling back into the long-term trend, contributed to the post-recession reduction in poor men's unpaid work time (although other shifts counteracted this decrease, resulting in no statistically significant change in their unpaid work time). In sum, the shifts in the employment conditions were especially important in explaining the gender differences in the unpaid work-time changes and the shifts in household characteristics —in explaining the poverty-based differences.

Complementing these findings, our analysis of the unexplained portion of the gap reveals that the unexplained portion is insignificant in all cases except for nonpoor men between pre-recession and recession periods and for nonpoor women between recession and post-recession periods. A more careful investigation of the drivers of the adjustments in the latter two cases reveals that in the case of nonpoor men seasonal and weekly changes were the primary factors between pre-recession and recession periods, with nonpoor men reducing their work time particularly during the summer months and their days off. This picture is consistent with the initial finding that the contraction in nonpoor men's unpaid work time took place in maintenance activities. In the case of nonpoor women, the main driver of the adjustments

between recession and post-recession periods was the particularly strong reduction in the unpaid work time of women with some college education or higher. This could be an indication of their greater ability to purchase market substitutes for household-produced goods. Combined with the evidence that the recession/post-recession reductions in nonpoor women's unpaid work time took place primarily in routine activities and childcare, this could suggest that nonpoor women chose to purchase these services from the market. In addition, however, as the regression results reveal (Table 4), more educated women tend to spend more time on unpaid work time than less educated women. Hence, it is possible that the more educated women reduced the time spent on these activities, such as enrichment activities with children, without substituting them by purchasing market alternatives. The analysis of the unexplained portion of the gap so far has indicated that nonpoor individuals made strong downward adjustments in their unpaid work time (perhaps because to begin with they were spending more time on unpaid work than poor).

We argue that a similar analysis can be helpful in assessing the adjustments that were made by poor and nonpoor households even in the cases in which the total unexplained portion of the gap was insignificant. In particular, in the case of poor men's adjustments between pre-recession and recession periods, the total unexplained portion of the gap is statistically insignificant. However, unlike the cases of nonpoor men between pre-recession and recession periods and poor and nonpoor men between recession and post-recession periods, the sign of the unexplained portion is positive, providing tentative support to the argument that the adjustments to the unpaid work time that poor men made were upward. Furthermore, a detailed analysis of the relative adjustments of different subgroups reveals that part-time self-employed poor men especially increased their unpaid work time relative to full-time wage workers. Even more tellingly, poor men with not-employed spouses increased their unpaid work time, potentially due to greater financial pressures. Hence, although the evidence is tentative, it is nevertheless suggestive of the presence of the substitution effect among poor men between pre-recession and recession periods. Taken together, the analysis of the unexplained portion of the changes is supportive of the assertion that poverty status matters to the adjustments in the unpaid work time.

4.4 Robustness Analysis

We conduct additional estimations in order to place our results in a broader context and to assess their robustness.

Separating the trend from the cycle and accounting for the trend in the Oaxaca-Blinder decomposition: In these additional estimations, we aim at isolating the changes in the unpaid work time likely induced by the business cycle and at decomposing the resulting cyclical component of these changes. Our ability to accurately separate the trend effect from the cyclical effect is limited by the short time span of the data, which prevents us from using standard detrending approaches in time-series data analyses. Aguiar et al. (2013) deal with this limitation by taking advantage of the state-level variation in the changes of market and non-market time uses to isolate the trend effect from the cyclical effect. They find that their results are close to the estimates based on the linear trend from 2003 – 2007. Berik and Kongar (2013) use the linear trend from 2003 – 2007 and project it to 2008 – 2010 to demonstrate the presence of a cyclical behavior in the time use of men and women. As both studies emphasize, the validity of the linear trend approach is supported by the fact that the estimated trends from this relatively short period are consistent with the long-term trends documented in the previous literature (Bianchi et al. 2006). In line with this approach, we fit a linear trend for Jan 2003 through Nov 2007 for men and women separately and then estimate a constrained model with the unpaid work time as the dependent variable and the constrained trend and the cyclical dummy variables representing the recession and post-recession periods (with the pre-recession period being the base) as the explanatory variables (Appendix, Table B.1). We find that the evidence of a statistically significant cyclical component in the increase in poor men's unpaid work between pre-recession and recession periods and in the decline in nonpoor women's unpaid work after the recession.

We then evaluate the robustness of the Oaxaca Blinder decomposition in the context of the de-trended model using the 2003 – 2007 specification of the trend. Introducing the linear trend moves the portion of the change in the unpaid work from the unexplained to explained (by the trend) component. However it does not sizably affect the contributions of explained or unexplained components of the control variables.

Sample selection bias: A potential issue that may arise in the context of this model is the possibility of sample selection bias due the selection into poor and nonpoor groups. If unobservable factors determining poverty status also influence unpaid work time, the

coefficients on the explanatory variables in the unpaid work equation may be biased. For example, the health of an individual may influence her poverty status and also have an independent effect on her unpaid time if, for example, she is unable to perform certain household tasks, biasing the coefficient estimates in the unpaid work-time equation.

We evaluate the possibility of the sample selection bias by estimating the Heckman sample selection model (Heckman 1979). Even though the Heckman approach does not in principle require the inclusion of an additional variable in the selection equation, in order to ensure identification we consider several instruments. Data limitations prevent us from using some potentially strong instruments, such as detailed location variables (e.g. the ATUS detailed location data are not available after 2010). Given this constraint, we attempt to establish proper identification with property ownership (ownership versus renting) and age squared as identifying variables in the selection equation (Table 7). We exclude days off and summer from the selection equation because the poverty status does not depend on whether the interview was conducted on a day off or during a summer month because it is based on annual income status. Our results yield no evidence of the sample selection bias among poor men and women, although the corrected model does not converge for poor men between pre-recession and recession periods, potentially because our instruments do not introduce enough variation to ensure the concavity of the log pseudolikelihood function. For nonpoor men and women, we do observe the evidence of the sample selection bias. However the implications with respect to the mean movements in the unpaid work time are unchanged. In particular, as Table 7 shows, similarly to the unadjusted specification, between pre-recession and recession periods, nonpoor men's adjusted mean of their unpaid work time decreased. Also, similarly to the unadjusted picture, between recession and post-recession periods, the adjusted mean of the unpaid work time of nonpoor men did not change. For nonpoor women, the decreases in unpaid work between pre-recession and recession periods, as well as between recession and post-recession periods, remained after the sample selection correction. Hence, while acknowledging the limitations of this correction procedure, our sample selection estimations appear to support the robustness of our results.

Table 7 Sample-selection-corrected Decomposition Results.

	Nonpoor men				Nonpoor women			
	Pre-recession/Recession		Recession/Post-recession		Pre-recession/Recession		Recession/Post-recession	
	uncorrected	corrected	uncorrected	corrected	uncorrected	corrected	uncorrected	corrected
Prediction_aft	1,087***	1,114***	1,069***	1,108***	1,793***	1,821***	1,684***	1,711***
	(21.38)	(24.76)	(13.68)	(15.89)	(24.44)	(28.63)	(15.34)	(18.53)
Prediction_bef	1,134***	1,171***	1,087***	1,114***	1,853***	1,890***	1,793***	1,821***
	(12.03)	(13.70)	(21.38)	(24.76)	(12.64)	(15.22)	(24.44)	(28.63)
Difference	-46.87*	-56.89**	-18.43	-6.618	-60.08**	-68.49**	-108.9***	-110.4***
	(24.53)	(28.29)	(25.38)	(29.42)	(27.52)	(32.42)	(28.85)	(34.11)
Explained	11.56	11.71	8.257	8.257	-26.39	-26.30	-12.06	-12.06
	(14.70)	(14.70)	(16.90)	(16.90)	(17.60)	(17.61)	(19.95)	(19.95)
Unexplained	-58.43**	-68.60**	-26.69	-14.87	-33.70	-42.19	-96.87***	-98.32***
	(25.59)	(29.02)	(26.91)	(30.92)	(26.43)	(31.44)	(29.17)	(34.36)
Observations	23,681	28,064	17,433	21,285	28,047	35,607	19,970	26,075

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

5. CONCLUSIONS

Poverty influences the welfare of households in a multitude of ways. In this paper, we use the ATUS data to examine links between poverty and unpaid work-time changes of men and women in the United States and evaluate them along the stages of the most recent business cycle during 2003–2012. We establish that the changes in unpaid work time during this period varied by poverty status and gender. In particular, between pre-recession and recession periods the unpaid work time of poor men increased, in contrast to the decrease in nonpoor men's unpaid work time. Furthermore, nonpoor women decreased their unpaid work time throughout the business cycle, whereas no change is observed among poor women.

We conduct the Oaxaca-Blinder decomposition of the unpaid work-time changes between pre-recession and recession periods and recession and post-recession periods for each of the four groups. The decomposition allows us to evaluate the extent to which the changes in the unpaid work time were due to the compositional shifts in individual and household characteristics, and the extent to which they could be attributed to the adjustments in unpaid work time due to being poor and nonpoor.

We find that the shifts in the characteristics did in fact play a considerable role in explaining the changes in the unpaid work time. In particular, the worsening of employment conditions was influential in determining the changes in the unpaid work over time, in line with earlier results in the literature. Unlike men and poor women, in the case of nonpoor women, it was associated with a decrease in the unpaid work time due to their lower inactivity rates between pre-recession and recession periods. In addition, however, the worsening of the spousal employment situation placed downward pressure on the unpaid work time of all four groups, with women being affected more than men. These two employment-related factors contributed to the gender differences in the unpaid work-time changes.

On the other hand, shifts in the household composition played a role in poverty variation. The average number of children and adults increased among the poor, in part due to the rise in the proportion of multigenerational poor households during the recession. Nonpoor households, on the other hand, observed a decrease in the average number of children, a part of the long-term trend in the US that continued in their case during the recession. These patterns were mirrored in the corresponding time use changes of poor and nonpoor individuals. In the case of poor men, in

particular, the increase in the number of children between pre-recession and recession periods contributed to the rise in their unpaid work time. In turn, the post-recession decrease in the number of children was especially strong in explaining the reduction in nonpoor women's unpaid work time.

Although the shifting characteristics were instrumental in influencing the poverty-based variation in unpaid work-time changes, in some cases more than two-thirds of the total change remains unexplained. The analysis of the unexplained portion is indicative of upward adjustments in the unpaid work time of poor men. On the other hand, nonpoor individuals made unequivocally downward adjustments in their unpaid work time.

These findings corroborate the possibility that the substitution effect may have played a role in the increase in poor men's unpaid work time, driven by the worsening of their employment situation and the increase in the number of children between pre-recession and recession, as well as by the adjustments that they made to their unpaid work time due to being poor. Among nonpoor men, the reduction in the unpaid work time between pre-recession and recession periods is not likely to be attributed to the dominance of the labor-market-related income effect, as the worsening employment situation placed upward pressure on their unpaid work time, as well. In their case, the worsening of the spousal employment situation played a contributing role, although the primary factor appears to be the sharp contractions during the summer months and days off.

Among nonpoor women, we once again cannot argue that the income effect dominated, as the worsening of their employment picture, too, placed upward pressure on their unpaid work time between recession and post-recession periods. Furthermore, the drop in unpaid work time due to the decreased inactivity rate between pre-recession and recession can hardly be seen as an indicator of the dominant income effect. The more likely explanation for the reduction in their unpaid work time lies in the downward push due to the worsening spousal situation and the decreased number of children. Even with these compositional changes, however, the unexplained reduction in nonpoor women's unpaid work time was the main factor. This downward adjustment could be attributed to the opposite of the conventional substitution effect if nonpoor women were substituting market goods for household goods. Support for this possibility is provided by the finding that, whereas all nonpoor women reduced their unpaid time use, the reductions were substantially stronger among the more educated nonpoor women, who

presumably could afford to substitute them. In addition, combined with the findings from the more detailed breakdown of activities, this result could be attributed to nonpoor women reducing the amount of time they spent on child-enriching activities, on which they spent significantly more time than poor women before the recession.

In conclusion, our results provide initial evidence of the poverty-based variation in the unpaid work-time changes that can be attributed both to the differences in the way poor and nonpoor groups' characteristics change and to the adjustments that individuals make due to being poor and nonpoor, setting the stage for a deeper investigation of the ways in which poverty matters in unpaid work-time changes. Exploring the contribution of the forces behind the shifts in the characteristics of the poor and nonpoor provides one possible venue for such an investigation as these shifts likely represent a combined effect of the shifts in the characteristics conditional on the poverty status and those resulting from the transition of some individuals between the two statuses. As an example, the greater increase in the proportion of unemployed individuals among the poor could be due to the poor having a greater likelihood of becoming unemployed and/or of the formerly nonpoor losing a job, joining the pool of the poor and introducing their characteristics into this pool. Similarly, the finding that the proportion of households with 2 or more children increased only among poor households between pre-recession and recession periods may be indicative of the poor households being more likely to merge. But it can also be due to the possibility that the merged households, which may have been nonpoor before, are more likely to be classified as poor as a result of the merger. Differentiating between these reasons can be an important step in disentangling the complex links between poverty and unpaid work-time changes. The fundamental reason underlying the complexity of these links lies in the multidimensional nature of poverty that extends beyond financial constraints and household considerations. Exploring these dimensions will be essential to the understanding of the causes of the different adjustments in the unpaid work time that poor and nonpoor individuals make.

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Appendix

A. American Time Use Survey (ATUS)

Unpaid work includes *three subsets of activities: routine, maintenance, and care:*

Maintenance tasks include *Interior and Exterior maintenance, repair, and decoration; Lawn, Garden, and Houseplants; Vehicles; Appliances, Tools, and Toys; and Travel related to such activities.*

Routine tasks include *Housework; Food and Drink preparation, presentation, and clean-ups; Animals and pets; Household management and other activities; Consumer purchase; Professional and Personal care services, Household services; Government services and Civic obligations; Telephone calls related to such activities; Travel related to such activities.*

Care includes *Caring for and Helping Household members and Non-household members; Telephone calls to and from paid child or adult care providers; Travel related to such activities.*

B. Tables

Table B.1. Changes in the Unpaid Work Time, 2003 - 2012 (in Weekly Minutes), with and without Trend.

VARIABLES	Unpaid work w/o trend (1)	Unpaid work with trend (2)
FEMALE		
Recession/pre-recession	-57.50**	13.98
	(25.19)	(25.18)
Post-recession/recession	-84.11***	-29.75
	(26.31)	(26.30)
trend		-21.78
		(0)
Constant	1,886***	1,951***
	(11.61)	(11.59)
Observations	53,969	53,969
R-squared	0.002	
POOR FEMALE		
Recession/pre-recession	-73.21	-1.706
	(59.47)	(59.42)
Post-recession/recession	-6.466	48.96
	(60.95)	(60.91)
Trend		-21.78
		(0)
Constant	1,996***	2,061***
	(27.27)	(27.23)
Observations	11,984	11,984
R-squared	0.001	
NONPOOR FEMALE		
Recession/pre-recession	-54.21*	17.27
	(27.68)	(27.67)
Post-recession/recession	-110.4***	-56.36*
	(29.01)	(29.01)
trend		-21.78
		(0)
Constant	1,858***	1,923***
	(12.78)	(12.76)
Observations	41,985	41,985
R-squared	0.003	
MALE		
Recession/pre-recession	-18.14	-0.425
	(23.09)	(23.09)
Post-recession/recession	-24.27	-10.84
	(23.85)	(23.85)
trend		-5.400
		(0)
Constant	1,123***	1,139***
	(10.63)	(10.63)

Observations	43,095	43,095
R-squared	0.000	
POOR MEN		
Recession/pre-recession	123.0*	140.8**
	(69.57)	(69.56)
Post-recession/recession	-42.81	-29.21
	(70.99)	(70.98)
trend		-5.400
		(0)
Constant	1,029***	1,045***
	(25.45)	(25.45)
Observations	7,250	7,250
R-squared	0.002	0.002
NONPOOR MEN		
Recession/pre-recession	-47.22**	-29.52
	(23.86)	(23.85)
Post-recession/recession	-21.62	-8.241
	(24.73)	(24.73)
trend		-5.400
		(0)
Constant	1,142***	1,158***
	(11.69)	(11.69)
Observations	35,845	35,845

Notes: Standard errors in parenthesis; *** p<0.01, ** p<0.05, * p<0.1; column 2 corresponds to the constrained regression with the trend defined over Jan 2003 – Nov 2007 for men and women separately; in that regression, the trend is statistically significant for women and statistically insignificant for men.