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## Couples' time together: complementarities in production versus complementarities in consumption

Hani Mansour · Terra McKinnish

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**Abstract** Economists have previously suggested that gains from marriage can be generated by complementarities in production (gains from specialization and exchange) or by complementarities in consumption (gains from joint consumption of household public goods and joint time consumption). This paper uses the American Time Use Survey (ATUS) from 2003 to 2011 to test whether couples that engage in less specialization (are more similar in hours of market work) spend more time together. We find that among married couples without young children, those with a greater difference in weekly hours of work between husband and wife spend less time together on non-working weekend days. Importantly, we find that this relationship is quite symmetric between couples in which the husband works greater hours and couples in which the wife works greater hours. We do not find evidence of a relationship between specialization and couple time together among couples with young children.

**Keywords** Time use · Home production · Gains from marriage · Specialization

**JEL Classifications** J22 · J12 · J13

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## 1 Introduction

Economists have noted that technological changes and rising wages of women have reduced household specialization and gains from marriage based on complementarities in production. As a result, household specialization does not appear to be sufficient in many couples to be the primary source of marital surplus. Previous researchers have proposed that joint consumption of household public goods and leisure is another source of marital surplus (Lam 1988; Stevenson and Wolfers 2007; Lundberg 2012). Therefore, we might think of the stock of married couples as a mix of those who generate their marital surplus largely through complementarities in production and those who generate their marital surplus largely through complementarities in consumption.

To the extent that complementarities in consumption are an important source of marital surplus, one potential measure of interest is the joint time consumption of married couples. For instance, Fisher et al. (2007) analyze time diary data spanning more than 40 years and show that over time, married couples have increased the time spent together in various activities. Using data from the American Time Use Survey (ATUS) 2003–2011, this paper specifically tests whether couples that engage in less specialization (are more similar in hours of market work) spend more time together, which would be consistent with a model in which they generate more gains from joint consumption.

This paper specifically focuses on joint time consumed with spouse on non-working weekend days. Much of the existing literature on couple time use has focused on couple's synchronization of work hours on workdays and time use allocations between market work, household production, and leisure on a given day. Relatively little work has focused on the amount of time couples actually spend together, and what little there is has also tended to focus on workdays. In contrast, we specifically study days on which married individuals report no market work. This approach, we argue, allows us to analyze behavior more fundamentally related to preferences, rather than outcomes that reflect constraints imposed by different flexibilities in work hours for people with different labor market characteristics.

Our primary analysis focuses on dual-earner couples. Among married dual-earner couples, we find that couples with a greater difference in weekly hours of work between husband and wife spend less time together on non-working weekend days. Specifically, a couple in which one spouse works 20 h a week more than the other is predicted to spend 27.2 fewer minutes together on a non-working weekend day compared to spouses with equal work hours. This is about a 10 % of a standard deviation of couple time together and a 56 % of the effect of having a child on joint time. When the analysis is stratified by the age of the youngest child, we find no evidence of this relationship for couples whose youngest child is 12 or under, but that the relationship between specialization and joint time consumption does exist for couples with older children and for couples with no children living at home.

Importantly, we find that the relationship between specialization and couple time together is quite symmetric between couples in which the husband works greater hours and couples in which the wife works greater hours. Greater specialization is associated both with less joint time in household production and less joint time in

leisure. The magnitude of the relationship is weaker when non-working spouses are included in the sample.

The remainder of the paper is organized as follows: Section 2 reviews the literature and discusses the predicted relationship between specialization and couples' time together, Section 3 describes the ATUS data and our sample, Section 4 describes the empirical specifications, and Section 5 discusses the results.

## 2 Marital surplus and couples' time together

In a model of marriage in which marital surplus is generated by production complementarities and gains from specialization, there are larger gains to marriage when individuals with high relative returns to market work marry spouses with low relative returns to market work, in other words, negative assortative matching on market wages (Becker 1981). An alternative source of marital surplus is complementarities in consumption, which can result from risk pooling, joint consumption of household public goods (such as children), and the direct utility of time spent together. In the latter case, larger gains to marriage are generated when individuals match with spouses with similar preferences for consumption (Lam 1988; Lundberg 2012).

Couples who generate marital surplus through specialization and exchange do not necessarily need to like each other or enjoy spending time together in order for the utility in the married state to dominate utility in the unmarried state.<sup>1</sup> In contrast, couples that engage in relatively little specialization likely require compatibility of preferences and positive utility from joint consumption in order to generate sufficient marital surplus. Lundberg (2012) analyzes the effect of personality traits on selection into marriage using the German Socio-Economic Panel Study. She finds that among older cohorts, personality traits affect selection into marriage very differently for women and men, consistent with gender specialization in marriage. For example, agreeableness increases marriage for women but decreases it for men. This is consistent with selection into marriage of women who are nurturing and men with earnings power. In contrast, for younger cohorts, she finds no difference between men and women in how personality predicts marriage. This is consistent with marital surplus generated from joint consumption, rather than specialization.

In this paper, we test whether couples that are less specialized, as measured by differences in weekly hours of work, do in fact spend more time together. While surprisingly little research has used differences in hours of market work as a dependent or independent variable, Lundberg and Rose (1999) study changes in specialization, as measured by the differences in hours of work, following the birth of a child using

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<sup>1</sup> It should be noted, however, that while couples that specialize do not need to enjoy each other's company, they do need to trust each other's commitment to the marriage. For example, a wife who doubts whether her marriage will last will be much more reluctant to specialize in household production, lowering her potential earnings in the event of divorce. To the extent that couples that are less certain of their marital stability will specialize less, this will bias us *away* from finding that less-specialized couples spend more time together.

the Panel Study of Income Dynamics. They find that specialization increases with the birth of the first child, but less so for couples who eventually divorce.

## 2.1 Prior research on married couple time use

In the literature on couples' time use, much of the previous work on couples' joint time use has focused on the synchronization of work activities, meaning whether couples adjust the timing of the work activities to increase the amount of time they are simultaneously away from work. Sullivan (1996), Hamermesh (2002), and Jenkins and Osberg (2005) find evidence that couples prefer to synchronize their work activities. Using data from the May Current Population Survey (CPS) Supplements, Hamermesh (2002) found that in the 1970s, the degree of work time synchronization was increased much more by an increase in the wife's wage than the husband's, but in the 1990 the effects were essentially equivalent. He also found that increases in the husband's or wife's hours of work produce equivalent reductions in the degree of synchronization. Hamermesh was only able to determine whether or not couples were at work at the same time. He could not determine whether or not the couples were spending their time together when they were not at work.

Hallberg (2003) specifically analyzes the amount of time couples spend together conditional on synchronization of activities. Using data from Sweden, he first calculates the total time that couples spend in synchronized non-work activities (i.e., they are both engaged in leisure at the same time or in household production at the same time, but not necessarily with each other).<sup>2</sup> He then calculates the fraction of synchronized time that the couple actually spends together. He analyzes how both synchronized time and the fraction of synchronized time that is joint time vary in husband's and wife's income and hourly wage rate using a sample of dual-earner couples reporting weekday time use. He theorizes that high income couples are able to spend more time together since they can afford to buy some services that, otherwise, they would have to do on their own (e.g., child care or house chores), but that high-income couples also may have more activities than low-income couples, increasing the trade-off cost between these activities and the time spent together with the spouse. Controlling for hours of market work on the same day, Hallberg (2003) finds no effect of either spouse's wages or income on hours of synchronized time. Conditional on synchronized time, but not hours of market work, the fraction that is jointly consumed increases with both husband's and wife's income.

In another study of couple time together, Morrill and Pabilonia (2012) estimate the effect of state unemployment rates on couple joint time. They find a U-shaped relationship in which increases in the unemployment rate initially decrease couple time together, but then the relationship reverses. They argue that initial declines

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<sup>2</sup>Because the observed timing of work can be an artifact of how a society is organized, Hallberg (2003) tested the leisure synchronization hypothesis by constructing artificial households of single men and women for whom only societal factors should impact their time synchronization. The results indicate that the hours couples spend in the market is significantly interdependent, even after differencing out synchronization behavior that stems out from the way a society is organized.

in economic conditions may be felt through changes in work schedules (shifts to evening and weekend work) that reduce couple time together, but at higher levels of unemployment job loss may increase couple time together.<sup>3</sup>

Using ATUS data, Connelly and Kimmel (2009) do not study couple time together, but they do study how one spouse's time use choices affect the choices of the other spouse. They analyze individual's time use in leisure, child care, and non-child care household production as a function of the relative wage with spouse, spouse's weekly hours, and spouse's time use on the same three non-market activities. They find little evidence that spouse's labor market characteristics or time use affects own time use, other than a positive complementarity for leisure.

## 2.2 Predictions for specialization and joint time use

This paper estimates the difference in joint time use across couples with different levels of specialization (in weekly hours of work). This approach assumes that joint time use is a useful proxy for a couple's gains from joint consumption. While it is unlikely that joint time with spouse is perfectly correlated with gains from joint consumption, it seems very reasonable that the correlation is positive. We argue that it is unlikely that couples that generate larger gains from joint consumption actually spend less time together than couples with smaller gains from joint consumption.

Starting with the simple case in which there are only two sources of marital surplus (gains from specialization and gains from joint consumption) and all couples have the same marital surplus, we can think of all couples as located on the same downward-sloping indifference curve, but generating their utility through different combinations of specialization and joint consumption. Given our assumption that joint time use measures gain from joint consumption, this would generate a negative relationship between joint time together and specialization.

It is important to note that the most likely violations of the simple conceptual model above would bias us *against* finding a negative relationship between specialization and joint time. If, for example, there is another source of marital surplus (e.g., insurance/risk pooling) that is the primary source of marital surplus for couples with less specialization, then it could be the case that couples who do and do not specialize are similar in joint consumption and joint time together. In this case, we should not observe a negative relationship between specialization and joint time.

If it is the case that couples with greater specialization on average have greater marital surplus than couples who do not specialize (so that specialized couples are on a higher indifference curve than couples who do not specialize), then it could be the case that specialized couples enjoy as much joint consumption and joint time as non-specialized couples. Once again, we should not observe a negative relationship between specialization and joint time.

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<sup>3</sup> Aguiar et al. (2013) find that the decline in market work from macroeconomic shocks results in much larger substitution into leisure than household production, but that among married couples with children there is substantial substitution into child care.

If, however, non-specialized couples have greater average marital surplus than specialized couples, this could cause us to overstate the negative relationship between specialization and joint time. We consider it unlikely that specialized couples on average generate less marital surplus than non-specialized couples.

### 3 Data

The data we use are drawn from the 2003–2011 waves of the American Time Use Survey (ATUS). Households in the ATUS are drawn randomly from the existing sample of the CPS. The ATUS is typically conducted 2–3 months after the final CPS survey, and the respondent is randomly chosen from the list of adult household members (age 15 or older). At the time of the survey, each respondent is asked to provide a 24-h diary of his or her activities in the previous day. Respondents describe their activities to the interviewers who then code them using three-digit codes. In addition to collecting information on the duration of each activity, respondents are asked to report where they were during the particular activity and with whom.<sup>4</sup> The U.S. Bureau of Labor Statistics aggregates the three-digit activity codes into 17 top-level categories, such as household activities, education, and socializing, relaxing, and leisure. Each of the 2004–2011 ATUS sampled about 13,000 respondents, while the 2003 survey includes a little over 20,000 respondents. More detailed information on the collection of the ATUS sample and on the different coding procedures can be found in Hamermesh et al. (2005).

While the ATUS provides very detailed activity codes, we categorized all activities as market work, household production, leisure, or personal care. For each activity an individual records in their time diary, we know whether the activity was conducted with their spouse. The exception is personal care activities (sleeping, grooming, etc.), for which respondents are not asked who was with them during the activity. Because we do not have any information about how much of their personal care time was spent jointly with spouse, we ignore this category of time use when calculating couples' time together, focusing only on joint time in leisure and in household production.

We match the time use data to information from the CPS on the weekly hours of work and weekly earnings for the ATUS respondents and their spouses as well as information on the number and ages of children in the household.

The full analysis sample contains individuals who are (a) married, (b) both husband and wife are ages 20–55, (c) filled out the time diary on a weekend, and (d) did not perform any market work on their diary day.<sup>5</sup> Ideally, we would like a sample of days on which neither spouse works, but unfortunately, only one member of the household fills out a time diary, so we do not know whether the spouse works on the time diary day. For that reason, we limit our sample to weekend days, as we expect

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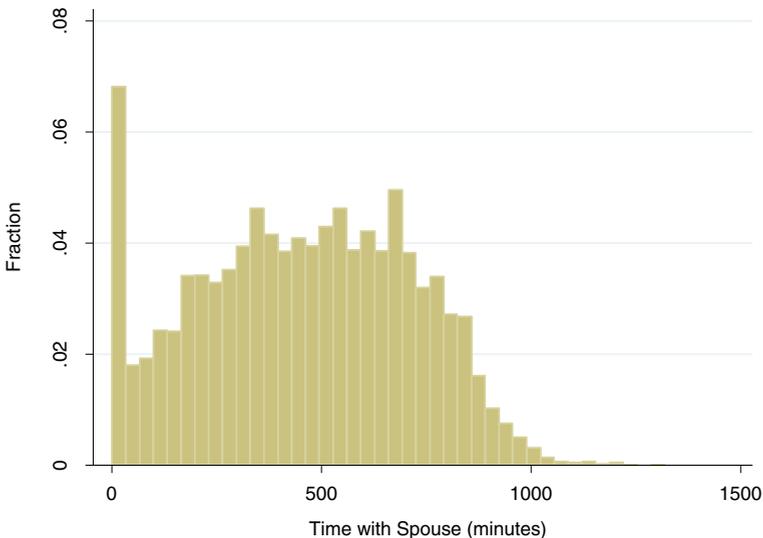
<sup>4</sup>The specific question asked is “who was with you?/who accompanied you?”

<sup>5</sup>For the purposes of determining the analysis sample, education-related activities are categorized as market work. An additional minor sample restriction to eliminate potential outliers is the exclusion of individuals who do not report at least 300 min of non-personal time on their time diary day.

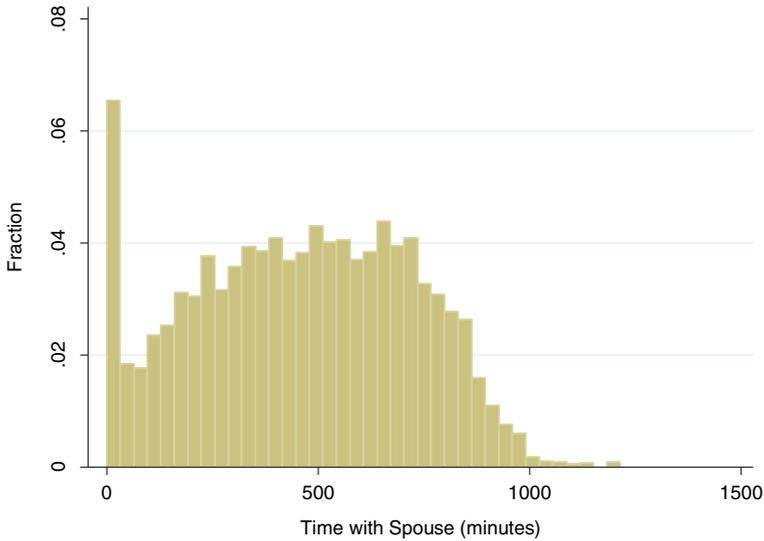
that it is much less likely that the spouse worked if it is a weekend day. Of ATUS respondents who meet sample selection criteria (a–c) above, 63.8 % of men and 75.7 % of women report no market work on their weekend time diary day, indicating that men are somewhat more likely to work on weekends. Therefore, the married women who fill out the time diary and qualify for our analysis sample are more likely to have a husband who works on the time diary day than the married men who fill out the time diary and qualify for our analysis sample.

Figure 1 is a histogram of total time with spouse (in minutes) on non-working weekend day for the full sample. Less than 7 % of the sample reports no time with spouse on their day off. In our analysis, we first focus on the subset of couples in our full sample who are dual-earner couples, defined as couples in which both the husband and wife report positive weekly hours of work. Figure 2 replicates the histogram in Fig. 1 using just the dual-earner sample. The distribution of time with spouse is very similar to that observed in Fig. 1.

Table 1 reports sample means for the full sample as well as the dual-earner sample in which both spouses report non-zero weekly hours of work. On average, respondents report a considerable 468 min of time with spouse on their non-working weekend day off, 138 spent together in household production, and 330 min was spent together in leisure. Because the average respondent spends a total of 326 min on household production and a total of 453 min on leisure, this indicates that married individuals specialize more with regards to household production and engage in joint consumption for a higher fraction of their leisure time. The dual-earner sample, as expected, has higher work hours, higher combined weekly earnings, higher education, and fewer children on average, but very similar mean time with spouse.



**Fig. 1** Distribution of time with spouse on weekend day off, full sample



**Fig. 2** Distribution of time with spouse on weekend day off, dual-earner sample

#### 4 Methods

The primary regression specification is

$$\begin{aligned}
 \text{SpouseTime}_{ijt} = & \beta_0 + \beta_1 |\text{HusbHours}_i - \text{WifeHours}_j| + \beta_2 |\text{HusbWage}_i - \text{WifeWage}_j| \\
 & + \beta_4 \text{WifeHours}_j + \beta_5 \text{WifeWage}_j + \beta_3 \log(\text{HusbWeeklyEarn}_i \\
 & + \text{WifeWeeklyEarn}_j) + X_{ij}\beta_7 + \text{Year}\gamma_t + \varepsilon_{ijt}
 \end{aligned}
 \tag{1}$$

where SpouseTime is total minutes spent by husband *i* with wife *j* on non-working weekend day in year *t*. HusbHours is the husband’s weekly hours of work, and WifeHours is wife’s weekly hours of work. HusbWage and WifeWage are calculated hourly wages, and HusbWeeklyEarn and WifeWeeklyEarn are weekly earnings of the husband and wife. *X* contains controls for female (whether it is the husband’s or wife’s time diary report), husband’s and wife’s education (indicators for high school degree, college degree, and advanced degree), age and age-squared, indicators for the number of children (up to four or more), indicators for age of the youngest child (six 3-year age categories), husband’s and wife’s race and ethnicity (indicators for non-Hispanic black, non-Hispanic Asian, non-Hispanic other, and Hispanic), and indicator for Sunday (vs Saturday). Year is a vector of year indicators for survey years 2003–2011. All regressions are weighted using the ATUS personal sampling weights.

Following Lundberg and Rose (1999), we use the difference in husband’s and wife’s hours of market work as our measure of specialization. Figure 3 is a histogram of our key independent variable for the dual-earner sample, the absolute value of the

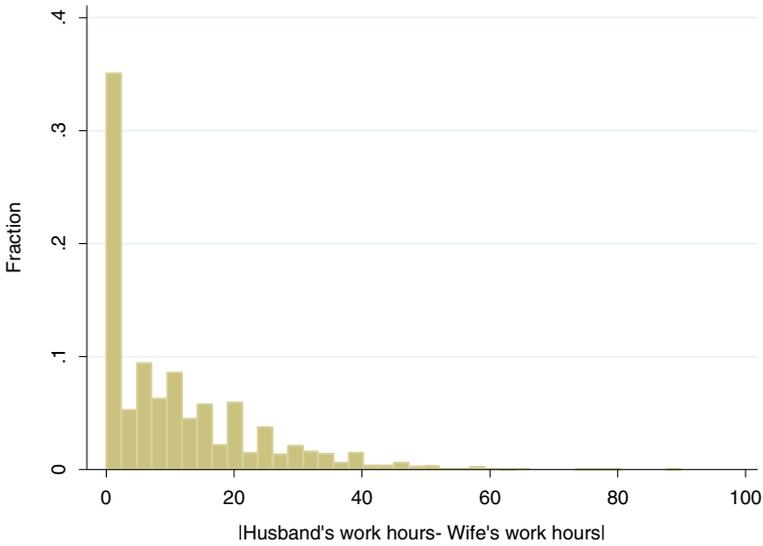
**Table 1** Husband's and wife's characteristics

	Full sample	Dual-earner sample
Time with spouse (min)	467.9(260.8)	466.7(261.2)
In household production	137.6(154.7)	137.5(155.7)
In leisure	330.3(218.7)	329.2(218.1)
Husband's weekly hours of work	38.4(16.5)	42.6(10.1)
Wife's weekly hours of work	23.3(19.4)	36.0(10.9)
Combined weekly earnings of husband and wife	1, 441.8(899.5)	1, 719.3(894.0)
Husband's hourly earnings		28.6(77.9)
Wife's hourly earnings		22.8(47.9)
Husband's age	40.3(8.6)	40.7(8.4)
Wife's age	38.6(8.7)	39.1(8.5)
Husband with high school degree (%)	88.1	92.3
Husband with college degree (%)	34.1	34.8
Wife with high school degree (%)	89.8	93.8
Wife with college degree (%)	35.0	38.3
Husband (non-Hispanic white) (%)	70.0	74.9
Husband (non-Hispanic black) (%)	7.0	7.5
Husband (Hispanic) (%)	17.7	13.1
Wife (non-Hispanic white) (%)	69.9	74.8
Wife (non-Hispanic black) (%)	6.4	7.0
Wife (Hispanic) (%)	17.7	12.9
Number of children	1.33(1.16)	1.17(1.10)
With child under 6 (%)	34.6	27.5
<i>N</i>	11, 735	6, 447

Full sample is ATUS 2003–2011 respondents who are (a) married, (b) both husband and wife are ages 20–55, (c) filled out the time diary on a weekend, and (d) did not perform any market work on their diary day. Dual-earner sample is restricted to couples in which both husband and wife report positive weekly hours of work. Sample means are weighted with ATUS personal sampling weights

differences in husband's and wife's hours. Not surprisingly, there is a big spike at zero for couples who work the same hours, mostly couples in which both spouses work 40 h per week. The remaining sample is spread out between 0 and 80 h, providing a substantial variation for estimating the relationship.

Equation 1 estimates the effect of the absolute value of the difference in hours between husband and wife controlling for wife's hours. One concern is that the raw difference in hours between husband and wife is largely positive and that the more appropriate interpretation of  $\beta_1$  is the effect of higher husband's hours of work rather than an effect of being a more specialized couple. Figure 4 is a histogram of the raw difference between husband's and wife's hours for the dual-earner sample. It shows that while husband's hours exceed wife's hours for the sizeable majority of couples,



**Fig. 3** Distribution of absolute value of difference between husband’s and wife’s work hours, dual-earner sample

there does appear to be sufficient mass below zero to estimate the effect separately for the case in which wife’s hours exceeds husband’s hours.

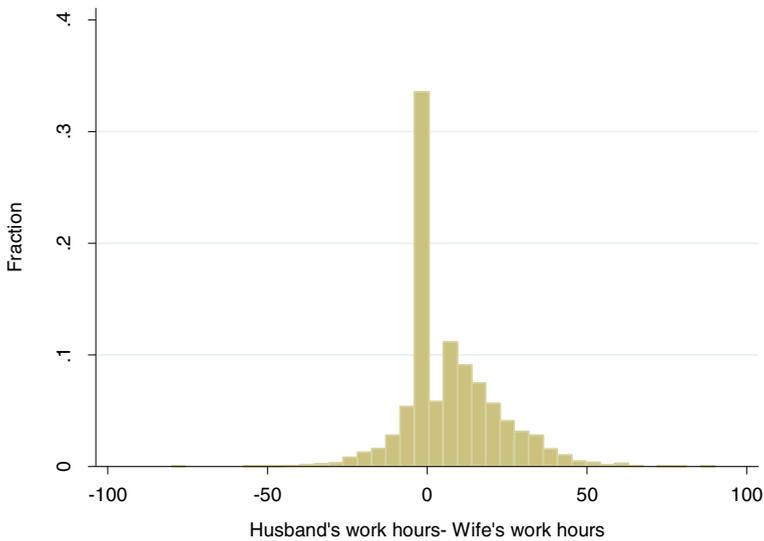
Therefore, in Eq. 2, we interact the absolute value of the difference in husband’s and wife’s hours with indicator variables for whether the husband’s hours exceeds the wife’s or the wife’s exceeds the husband’s. This allows us to estimate separate effects depending on whether it is the husband or wife who is more specialized in market work.

$$\begin{aligned}
 \text{SpouseTime}_{ijt} = & \beta_0 + \beta_1 |\text{HusbHours}_i - \text{WifeHours}_j| * I(\text{HusbHours}_i > \text{WifeHours}_j) \\
 & + \beta_2 |\text{HusbHours}_i - \text{WifeHours}_j| * I(\text{HusbHours}_i \leq \text{WifeHours}_j) \\
 & + \beta_3 |\text{HusbWage}_i - \text{WifeWage}_j| + \beta_4 \text{WifeHours}_j + \beta_5 \text{WifeWage}_j \\
 & + \beta_3 \log(\text{HusbWeeklyEarn}_i + \text{WifeWeeklyEarn}_j) \\
 & + X_{ij} \beta_6 + \text{Year} \gamma_t + \varepsilon_{ijt}
 \end{aligned}
 \tag{2}$$

## 5 Results

### 5.1 Dual-earner couples

Column 1 of Table 2 reports the results from estimating Eq. 1 on the dual-earner sample. The coefficient on difference in husband’s and wife’s hours of work is -1.36 and is statistically significant. This indicates that a couple in which one spouse works 20 h a week more than the other is predicted to spend 27.2 fewer minutes together on a non-working weekend day compared to spouses with equal work hours. Comparing



**Fig. 4** Distribution of husband's work hours minus wife's work hours, dual-earner sample

the magnitude of this effect to the coefficient on the single child indicator reported in the same column, this is about 56 % of the effect of having a child on couple time together. These results are consistent with a model in which couples that engage in greater specialization spend less time together.

What is additionally striking about the results in column 1 is how few of the other variables in the model have a statistically significant effect on time spent with spouse. Couples in which the wife works more hours do spend less time together. The coefficient on female is large and highly significant. This is due to the fact, as discussed earlier, that men are more likely to work on the weekend than women. Therefore, the married women who fill out the time diary and qualify for our analysis sample are more likely to have a husband who works on the time diary day than the married men who fill out the time diary and qualify for our analysis sample.

Having children reduces the time couples spend together, with couples with one child spending about 49 fewer minutes together than those with no children. Interestingly, while there is a big difference between couples who have children and those who do not, the effect of additional children is much smaller. While additional children further decrease the amount of time the couple spends together, the coefficients on indicators for a number of children are not statistically different from each other. Additionally, conditional on a number of children, the effect of age of the youngest child is statistically insignificant except for youngest child ages 6–8.

Other variables that we might think important—the wage difference between husband and wife, couple's weekly earnings, the wife's wage, husband's and wife's age and education—are largely insignificant. A doubling of husband's and wife's weekly earnings is associated with a mere 1-min increase in time spent together. While other research suggests that couple time together on work days is higher for higher earning

**Table 2** Time with spouse, dual-earner sample

	Total time with spouse		Time with spouse	
	1	2	3	4
Husband's hours - Wife's hours	-1.36 (0.375)***			
Husband's hours - Wife's hours  × Female		-1.09 (0.443)*	-0.453 (0.260) <sup>+</sup>	-0.638 (0.362) <sup>+</sup>
Husband's hours - Wife's hours  × Male		-1.68 (0.519)***	-0.553 (0.281)*	-1.13 (0.447)*
(Husband's wage - Wife's wage)	-0.078 (0.049)	-0.074 (0.049)	-0.068 (0.024)**	-0.006 (0.045)
Log (combined weekly earnings)	1.05 (10.19)	1.07 (10.17)	2.07 (5.79)	-1.00 (8.59)
Wife's hours	-1.27 (0.431)**	-1.26 (0.428)**	0.315 (0.225)	-0.944 (0.360)**
Wife's wage	0.042 (0.083)	0.035 (0.083)	0.032 (0.033)	0.003 (0.071)
Female	-39.7 (7.6)***	-45.8 (9.9)***	4.73 (6.25)	-50.5 (8.5)***
Husband's age	-2.27 (6.86)	-2.18 (6.86)	5.15 (3.96)	-7.33 (5.75)
Husband's age squared	-0.000 (0.083)	-0.001 (0.083)	-0.058 (0.048)	0.057 (0.070)
Wife's age	0.954 (6.67)	0.864 (6.67)	0.851 (4.03)	0.013 (5.5)
Wife's age squared	-0.050 (0.084)	-0.049 (0.084)	-0.028 (0.050)	-0.021 (0.069)
Husband high school degree	-2.48 (18.20)	-2.90 (18.18)	-5.76 (10.9)	-8.66 (15.5)
Husband college degree	-11.4 (20.6)	-12.0 (20.6)	3.42 (12.0)	-15.4 (17.3)
Husband advanced degree	16.3 (15.3)	-4.32 (22.8)	-2.45 (13.0)	-1.87 (19.3)
Wife high school degree	12.3 (12.7)	5.89 (19.5)	-6.90 (12.8)	12.8 (16.7)
Wife college degree	29.5 (14.4)	29.8 (21.5)	-0.302 (13.9)	30.1 (18.2) <sup>+</sup>
Wife advanced degree	34.3 (23.3)	34.7 (23.3)	-0.005 (15.0)	34.7 (20.0) <sup>+</sup>
1 child	-48.8 (15.7)**	-48.6 (15.7)**	-23.2 (8.8)**	-25.4 (13.2) <sup>+</sup>
2 children	-54.1 (17.4)**	-53.9 (17.4)**	-22.0 (9.9)*	-31.9 (14.9)*
3 children	-41.3 (20.6)*	-40.9 (20.6)*	-21.7 (12.3) <sup>+</sup>	-19.3 (17.4)*
4 or more children	-76.0 (28.1)**	-76.0 (28.1)**	-47.7 (14.3)***	-28.3 (23.0)
Youngest child aged < 3	-14.3 (17.8)	-14.4 (17.8)	50.2 (10.4)***	-64.6 (15.0)***
Youngest child aged 3-5	-24.8 (18.0)	-25.0 (18.0)	27.7 (10.3)***	-52.7 (15.0)***
Youngest child aged 6-8	-39.0 (17.6)*	-39.0 (17.6)*	7.21 (9.93)	-46.3 (14.9)**
Youngest child aged 9-11	-9.55 (17.8)	-9.94 (17.6)	1.15 (9.65)	-11.1 (15.1)
Youngest child aged 12-14	4.15 (17.4)	4.02 (17.4)	11.8 (9.8)	-7.8 (14.6)
Sunday	-3.24 (7.57)	-3.26 (7.56)	8.76 (4.56)	-12.0 (6.4) <sup>+</sup>
Controls for husband's and wife's race/ethnicity	Y	Y	Y	Y

**Table 2** (continued)

	Total time with spouse		Time with spouse	
	1	2	In HH production 3	In leisure 4
Year (fixed effects)	Y	Y	Y	Y
N	6,447	6,447	6,447	6,447

Sample is dual-earner sample described in notes of Table 1. Table reports estimates from Eq. 1. All regressions are weighted with ATUS personal sampling weights. Robust standard errors are in parentheses  
<sup>+</sup> $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

couples, due in part to their greater ability to coordinate work schedules, the same does not appear to be the case for couples on non-working weekend days.

One concern with the ATUS data is that we only receive one spouse's report of time use and, therefore, joint time with spouse. If we could observe both spouses' reports, the two reports of joint time with spouse could differ. If there is classical measurement error in our dependent variable, this does not generate any bias in our estimates. Previous research has shown that husbands and wives provide differing reports of husband's time in household production, but not differing reports of wife's time (Kamo 2000; Lee and Waite 2005). It is possible that men and women systematically differ in their reports of joint time with spouse. To check whether this affects our estimates, in column 2 of Table 2, we interact the hours differential with indicators for whether the time diary report is from the male or female spouse. The two coefficients are fairly similar in magnitude and are not statistically different. Our findings are very similar regardless of whether the time diary was reported by the husband or by the wife.

Columns 3 and 4 report versions of the specification in column 2 in which joint time with spouse is separated into joint time in household production and joint time in leisure. For both categories of time use, joint time is lower for couples with less specialization, though the effects on joint leisure are somewhat larger. There are some differential effects between joint time in household production and leisure for some of the control variables. A larger wage differential between husband and wife does lower joint time in household production, but not in leisure. Higher weekly hours of work for the wife reduce joint time in leisure, but not in household production. There is some evidence that wife's education increases joint leisure time. Finally, while age of the youngest child has little effect on total joint time together, younger children do shift the composition of joint time use from leisure to household production.

Table 3 reports estimates from Eq. 2 in which we differentiate between couples in which the husband is more specialized in market work and those in which the wife is more specialized in market work. The effects of the difference in work hours are quite symmetric between the two types of couples. When joint time is split into household

**Table 3** Symmetry by primary worker, dual-earner sample

	Total time with spouse 1	Time with spouse in HHP 2	Time with spouse in leisure 3
Husband's hours - Wife's hours  × 1(Husband's hours greater)	-1.22** (0.439)	-0.499* (0.246)	-0.726* (0.361)
Husband's hours - Wife's hours  × 1(Wife's hours greater)	-1.75* (0.799)	-0.499 (0.419)	-1.25 <sup>+</sup> (0.669)
(Husband's wage - Wife's wage)	-0.065 (0.054)	-0.069* (0.027)	0.004 (0.048)
Log (combined weekly earnings)	0.003 (10.3)	2.06 (5.95)	-2.06 (8.61)
Wife's hours	-1.07* (0.530)	-0.317 (0.300)	-0.757 <sup>+</sup> (0.440)
Wife's wage	0.036 (0.084)	0.033 (0.033)	0.004 (0.072)
N	6,447	6,447	6,447

Sample is dual-earner sample described in notes of Table 1. Table reports estimates from Eq. 2. Regressions include all control variables included in Table 2 and are weighted using ATUS personal sampling weights. Robust standard errors are in parentheses

<sup>+</sup> $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$

production and leisure in columns 2 and 3, the two coefficients are essentially identical for household production. For leisure time, the hours differential for couples in which the wife works more hours appears to have a larger effect than the differential for couples in which the husband works more hours, but the difference between the two coefficients is not statistically significant.

Table 4 estimates Eq. 1 separately for couples whose youngest child is a pre-teen, those whose youngest child is a teenager, and those who do not have children under 18 at home.<sup>6</sup> The results in column 1 suggest that there is no relationship between couple specialization and couple time together for couples with pre-teen children. In column 2, the coefficient on the hours differential for couples whose youngest child is a teenager is statistically significant and similar in magnitude to the estimates in Table 2. In columns 3 and 4, we report estimates for couples without children under 18 living at home, dividing the sample into two separate groups. Column 3 uses only those couples without children in which the wife is 36 years old or younger. This sample should disproportionately contain couples that have not yet had children. In column 4, the sample is couples without children at home in which the wife is age 37 or older. This sample should disproportionately contain couples who have had children, but no longer have children under 18 years old. For both samples, the coefficient on the hours differential is negative, statistically significant, and larger in

<sup>6</sup>Because we are already splitting the sample into considerably smaller subsamples, it is problematic to further estimate a separate coefficient for couples in which the wife works greater hours.

**Table 4** Time with spouse by age of youngest child, dual-earner sample

	Youngest child's age <13 1	Youngest child's age 13–17 2	No children under 18 and wife's age ≤36 3	No children under 18 and wife's age ≥37 4
Husband's hours - Wife's hours	0.248 (0.468)	-1.78* (0.730)	-4.82*** (1.46)	-2.53** (0.927)
(Husband's wage - Wife's wage)	-0.214* (0.102)	-0.014 (0.061)	-0.379*** (0.085)	0.024 (0.062)
Log (combined weekly earnings)	-6.12 (11.7)	-2.32 (22.6)	34.5 (50.2)	5.39 (25.0)
Wife's hours	-0.198 (0.529)	-0.959 (0.858)	-4.41* (1.82)	-0.965 (1.04)
Wife's wage	0.193 (0.128)	-0.104 (0.084)	-0.779 (1.81)	0.172 (0.308)
N	4,122	887	454	984

Sample is dual-earner sample described in notes of Table 1. Table reports estimates from Eq. 1 separately by the presence of young children. Regressions include all control variables included in Table 2 and are weighted with ATUS personal sampling weights. Robust standard errors are in parentheses  
\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

magnitude than estimates for couples with children under 18. The coefficient of -4.82 for couples without children and a wife age 36 or younger indicates that a couple in which one spouse works 20 h a week more than the other is predicted to spend 96.4 fewer minutes together than spouses with equal work hours. The coefficient of -2.53 for couples without children and a wife age 37 or older indicates that a couple in which one spouse works 20 h a week more than the other is predicted to spend 50.6 fewer minutes together than spouses with equal work hours. One possible interpretation of the results in Table 4 is that for couples with younger children, time with spouse is constrained in ways that reduce the influence of other factors.

These results in columns 3 and 4 of Table 4 are informative for another reason. One weakness of our data is that our sample is a select cross section of surviving couples, and we do not know how long a couple has been married. We can reasonably assume, however, that column 3 disproportionately contains recently married couples that have not yet had children and that column 4 disproportionately contains couples that have a much longer duration of marriage compared to those in column 3. The fact that we find a sizeable negative coefficient on the hours differential in both samples provides some evidence that our results would be robust to a control for duration of marriage.<sup>7</sup>

<sup>7</sup>One possibility is to use the age of the oldest child as a proxy for duration of marriage. We only, however, observe age of children for those living at home, so this approach is only feasible for families with children at home. The estimates in columns 1 and 2 of Table 4 are robust to controls for the age of the oldest child at home and its square.

**Table 5** Time with spouse, full sample

	Time with spouse 1	Time with spouse in HH production 2	Time with spouse in leisure 3
Husband's hours - Wife's hours  × 1(Husband's hours greater)	-0.606* (0.252)	-0.252 <sup>+</sup> (0.136)	-0.354 <sup>+</sup> (0.209)
Husband's hours - Wife's hours  × 1(Wife's hours greater)	-0.691* (0.319)	-0.228 (0.181)	-0.463 <sup>+</sup> (0.265)
Log (combined weekly earnings)	3.83 (5.80)	7.16* (3.30)	-3.32 (5.03)
Wife's hours	-0.557 (0.381)	-0.051 (0.207)	-0.506 (0.321)
Wife's hours = 0	9.67 (12.54)	5.79 (7.15)	3.88 (10.69)
N	11,735	11,735	6,447

Sample is full sample described in notes of Table 1. Regressions include all control variables included in Table 2 (other than those for wife's wage) and are weighted with ATUS personal sampling weights. Robust standard errors are in parentheses

<sup>+</sup> $p < 0.10$ ; \* $p < 0.05$

## 5.2 Full sample

Table 5 reports estimates from Eq. 2 for the full sample. Because non-working spouses are now included in the sample, wife's wage and the wage differential are no longer included in the model. An indicator for whether the wife does not work is added in addition to the linear control for wife's hours. This allows for the possibility that joint time use for couples with a stay-at-home wife may differ from that of couples with a working wife in ways not fully captured by a linear control for working hours. In column 1, the estimates on the hours differential for total time with spouse are negative, statistically significant, and symmetric between couples in which the wife works more hours and couples in which the husband works more hours. The magnitude is about half that estimated using the dual-earner sample.

Columns 2 and 3 of Table 5 split time with spouse into household production and leisure. As was the case in Table 2, the hours differential estimates are negative for both categories of time use, but larger in magnitude for leisure.

Table 6 replicates the analysis by age of the youngest child from Table 4 for the full sample. The primary difference between the results in Table 6 and those using the dual-earner sample in Table 4 is the smaller effect for couples whose youngest child is a teenager. It should be noted that the loss of statistical significance for couples with a teenage youngest child compared to the full sample results more from the loss of sample size and increase in standard error than the reduced magnitude of the coefficient. The estimate for couples with a teenage youngest child is roughly two thirds that for the full sample.

**Table 6** Time with spouse by age of youngest child, full sample

	Youngest child aged <13 1	Youngest child aged 13–17 2	No children under 18 and wife's age ≤36 3	No children under 18 and wife's age ≥37 4
Husband's hours - Wife's hours	-0.308 (0.236)	-0.406 (0.550)	-2.14** (0.813)	-1.44** (0.502)
Log (combined weekly earnings)	12.0 <sup>+</sup> (6.3)	-15.86 (13.85)	9.27 (22.79)	-7.60 (14.84)
Wife's hours	-0.467 (0.377)	0.079 (0.876)	-2.81 <sup>+</sup> (1.51)	-0.091 (0.878)
Wife's hours = 0	-3.42 (13.70)	9.90 (32.44)	-45.1 (61.6)	78.22* (35.6)
N	8,111	1,361	638	1,625

Sample is full sample described in notes of Table 1. Table reports estimates from Eq. 1 separately by the presence of young children. Regressions include all control variables included in Table 2 (other than those for wife's wage) and are weighted with ATUS personal sampling weights. Robust standard errors in parentheses

<sup>+</sup> $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$

## 6 Conclusions

The source of marital surplus is important as it generates predictions regarding how individuals will sort and match in the marriage market and what sort of shocks will reduce the surplus and destabilize the marriage. This paper makes a modest step in understanding the source of marital surplus by confirming that couples who are less specialized in hours of work spend more joint time together. This is consistent with a model in which some couples generate marital surplus through gains from joint consumption rather than gains from specialization and trade.

We do not find any evidence of a negative relationship between specialization and joint time consumption for married couples with children ages 12 and under. It is not clear why this would be the case. Perhaps having young children places greater constraints on couple time together. It should be noted that joint consumption of a public good (such as children) also generates marital surplus, so it could be that couples with young children who specialize less on average make greater investments in their children and derive their marital surplus from joint consumption of this public good.

It is also important to recognize that our analysis is conducted on a cross section of surviving marriages. Our analysis can only be interpreted as a comparison across couples that are currently married, in which case, the sample is positively selected on marital surplus, with marriages with smaller surplus having disproportionately dissolved. While there is evidence that less specialized couples are more likely to divorce (Lundberg and Rose 1999), our data do not allow us to consider whether joint time consumption is related to the long-term stability of a marriage. Therefore, while we know our sample is positively selected on marital surplus, we do not know if it is

selected on a particular source of marital surplus, but our results do suggest that joint time consumption may be a source of marital surplus, warranting further analysis.

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## References

- Aguiar M, Hurst E, Karabarbounis L (2013) Time use during the great recession. *Am Econ Rev* 103:1664–1696
- Becker GS (1981) *A treatise on the family*. Harvard University Press, Cambridge
- Connelly R, Kimmel J (2009) Spousal influences on parents' non-market time choices. *Rev Econ House* 7:361–394
- Fisher K, Egerton M, Gershuny JJ, Robinson JP (2007) Gender convergence in the American heritage time-use study. *Soc Indi Res* 82:1–33
- Hallberg D (2003) Synchronous leisure, jointness and household labor supply. *Lab Econ* 10:185–203
- Hamermesh DS (2002) Timing, togetherness and time windfalls. *J Popul Econ* 15:601–623
- Hamermesh DS, Frazis H, Stewart J (2005) Data watch: the American time use survey. *J Econ Persp* 19:221–232
- Jenkins S, Osberg L (2005) Nobody to play with? The implications of leisure coordination. In: Hamermesh DS, Pfann G (eds) *The economics of time use*. Elsevier, Amsterdam, pp 113–145
- Kamo Y (2000) "He said, she said": assessing discrepancies in husbands' and wives' reports on the division of household labor. *Soc Scien Res* 29:459–476
- Lam D (1988) Marriage markets and assortative mating with household public goods: theoretical results and empirical implications. *J Human Resour* 23:462–487
- Lee YS, Waite LJ (2005) Husbands' and wife's time spent on housework: a comparison of measures. *J Marr Fam* 67:328–336
- Lundberg S (2012) Personality and marital surplus. *IZA J Lab Econ* 1:3
- Lundberg S, Rose E (1999) *The determinants of specialization within marriage*. University of Washington Mimeograph
- Morrill MS, Pabilonia S (2012) What effects do macroeconomic conditions have on families' time together? Discussion Paper 6529, IZA
- Stevenson B, Wolfers J (2007) Marriage and divorce: changes and their driving forces. *J Econ Persp* 21:27–52
- Sullivan O (1996) Time co-ordination, the domestic division of labour and affect relations: time-use and the enjoyment of activities within couples. *Sociology* 30:97–100