

Marriage: for love, for money...and for time?

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Abstract Married couples enjoy meaningful economies in time, often choosing to specialize where one spouse focuses on market work and the other on household production and childcare. Using data from the American Time Use Survey 2003–2008, I estimate significant marriage effects upon time use. Most married women gain 33–34 min of leisure each weekday when compared to single women. While marriage does not lead to more leisure for husbands, it allows them to allocate time away from home and towards market work. Lower-income couples work more at home and for pay, and spend less time in leisure than their single counterparts. The temporal and financial gains from marriage for most people are inconsistent with its declining prevalence.

Keywords Marriage · Time use · Household production · Allocation of time · Household composition

JEL Classification J10 · J12 · J22

1 Time use and marriage

Marriage conveys many tangible economic benefits. Spouses can take advantage of household economies of scale, reducing their per capita housing and energy costs by sharing common spaces and furnishing, lowering their transportation costs by sharing automobiles, and economizing on food costs by buying in bulk and by cooking more meals at home. Marriage is distinguished from other joint living arrangements by community property rights that extend equal ownership of all acquired assets to both spouses. Married couples end up pooling their incomes and

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savings, becoming more diversified against future shocks and earning higher expected returns due to their increased tolerance for risks.

Along with these financial benefits, married couples also enjoy economies in time when compared to their single counterparts. It takes roughly the same amount of time to cook a meal for two people as it does for one person, freeing the time of the spouse not doing the cooking. Housecleaning and childcare have comparably high economies of scale as well. When children are present, married couples often choose a highly specialized division of labor where one spouse allocates her time to childcare and home production while the other spouse allocates his time to the market. In fact, the institution of marriage evolved to shelter this particular outcome.

My interests are the economies in time arising in marriage and the distribution of these gains by gender and income. How much time, if any, do married couples save in household activities, and which of these activities (food preparation, housework, childcare or other chores) afford such economies? Are the resulting gains of leisure distributed equally among men and women? How do these economies in time differ for lower- and higher-income families? Some insights are available from the emerging time use literature, but no previous study focused on these questions in particular.

It is important to understand the relationship between family composition and the allocations of non-market time. If married couples spend less total time in work and gain more leisure, then the welfare of married households may be underestimated by the conventional expenditure-based equivalence scales as are often used for measuring the incidence of poverty. On the contrary, if married couples work more in total and enjoy less leisure than do singles, then their welfare may be lower than the traditional equivalence scales suggest. An analysis of household production may also help us better understand the time gains from marriage and losses from divorce. If marriage causes time saving in tedious tasks and permits more leisure, then we see gains from marriage of “quality time.” And, if these benefits are not shared equitably between spouses, this may help explain a rising share of single-adult households.¹

Using data on single and married adults from the American Time Use Survey 2003–08, I estimate married women in higher-income households work 33–34 min less in total at home and for pay each weekday than do single females of comparable income. Among lower-income households, the total work of married women with children is 15–34 min more each day than for single women, and women without children work 37–48 min more than do singles. Among each group (level of income, presence of children), married women work fewer hours in the market than single women, ranging from 18 min fewer per weekday for lower-income women without children to 3 h fewer for higher-income women with children. For men, the results are diametrically opposed. In lower-income households, married men work significantly more in the market than do single men, 83 min more per weekday without children and 110 min more with children. In higher-income households, the

¹ According to the Census Bureau, the proportion of married couples decreased from 84% in 1930 to 56% in 1990, and to under 50% in 2006.

marriage effect for men is less dramatic, 13 min more market work per weekday without children and 35 min more with children.

Interestingly, married couples do not spend less combined time in household production when compared to single adults, rather a combined 44–78 min more each weekday. As for the unpaid work, married women prepare the meals, and higher-income couples spend 12–21 min more, combined, in food preparation than do single adults of comparable income level. Married couples also spend significantly more time in housework than do single adults, from 16 weekday minutes for higher-income couples without children to 39 min for lower-income with children. The paper offers several explanations for why economies in household production are found to be either small or non-existent for married couples. Simple calculations using data from the Consumer Expenditure Survey illustrate that by spending extra time in household chores couples generate valuable quality services, and hence achieve a higher standard of living. Finally, in terms of leisure, lower-income married women tend to use their gain of leisure time for personal care while higher-income married women tend to use theirs for active leisure. Time gains from marriage, accompanied by meaningful improvements in legal protections for married women, make the declining incidence of marriage paradoxical from an economic viewpoint.

This paper is organized as follows: In Sect. 2, I review the recent literature on time use in marriage. In Sect. 3, I describe the dataset and the sample, and in Sect. 4 the regressions estimates from the data. In Sect. 5, I discuss the results in the context of gender equity, traditional roles and the declining incidence of marriage.

2 Literature review: what do we know about the allocation of time by married couples?

Several strands of literature examine economic behaviors of individuals and families. Classical utility-theoretic models measure household economies of scale in expenditures. Theories of household production focus on allocations of time between paid and unpaid work. Marriage theories shed light on patterns of specialization within families. The emerging empirical time use literature tests these hypotheses using detailed time allocation data from families of different sizes and compositions.

One century ago, Engel noticed per capita food expenditures decrease with household size. More recently, Lazear and Michael (1980) estimated the expenditures of two adults living together to be 31–35% lower than two single-adults, with the largest savings in food and housing and smaller savings in personal care. The main sources of these economies are believed to be sharing expenses on household public goods, better waste management and buying in bulk at lower prices. Deaton and Paxson (1998) showed larger households spend less per capita on food than smaller households. This observation was presented as a paradox because larger households are wealthier due to many forms of sharing and can afford to consume more food. Deaton and Paxson questioned the existence of economies of scale in time, arguing if time and ingredients are complementary inputs into food

production food would be relatively cheaper for larger households and food expenditures would not decrease.

These observed food shares are consistent with the household production model (Becker 1965) where time and purchased ingredients are substitutes in meal production. Several recent studies found evidence this type of substitution takes place. Crossley and Lu (2003) compared the food expenditures and preparation time of single adults with childless couples, and showed the couples substituted away from prepared foods and towards cooking from scratch. Aguiar and Hurst (2004) demonstrated the same amount of food can be produced with different combinations of time and purchased inputs. There, a 17% decline in expenditures at the time of retirement was matched by a 53% increase in time spent shopping and preparing food, and neither the quantity nor quality of food intake declined. Both of these studies showed the relative costs of time versus inputs to be an important factor in household time allocation.

Gronau and Hamermesh (2006) estimated the goods- and time-intensities of a basket of commodities comprising everything produced at home: sleep, lodging, appearance, eating, childcare, leisure, health, travel and all else as “miscellaneous.” Food, health and lodging were characterized by these authors as goods-intensive, but the monetary value of the time inputs for these commodities dwarfs the costs of the market-purchased ingredients. For example, in this study the average US married couple spends 145 h each month in meal production and consumption, including time spent buying food. This translates to 2.4 food hours per person per day, or roughly 15% of each person’s waking time (assuming 8 h of sleep each night). Using an hourly wage of \$15, the opportunity cost of preparing meals for a married couple exceeded \$500² per week, or 4 times their \$120 weekly average food expenditure.³ Since housework and childcare are at least as time-consuming as meals, adults should be interested in any opportunity to save time, including those afforded by marriage.

In a typical household production model, each person’s time allocation is determined by the relative prices of the purchased inputs, his exogenous wage, the marginal productivity of his time at home, and his preference for final goods as opposed to leisure. The optimization problem grows more complex with the addition of another person, either spouse or child. A married person’s decision is influenced by not only his own income but his spouse’s as well. Preferences can be altruistic, and there may be positive externalities from household production (Briant and Zick 2006 for a review of models of the household). Chiappori’s (1997) collective models specify a resource sharing rule within households. Game-theoretic models assume husband and a wife bargain over the allocation of final goods and leisure, where the spouse with more bargaining power in terms of income and options outside marriage gains more of the marital resources.

² $34.5 \text{ h} * \$15 \text{ \$/h} = \$517.5$.

³ According to the Consumer Expenditure Survey 2006, an average two-person household spent over 12% of its total expenditures on food at home and away from home, not including alcohol. Average total annual expenditures was \$50,652, including \$6,203 on food whereas single adults spent on average \$3,249 on food. Source: <ftp://ftp.bls.gov/pub/special.requests/ce/standard/2006/cusize.txt>.

Several empirical studies found support for these models. Bloemen and Stancanelli (2009) studied married couples with children in France and showed a higher husband's wage decreases a wife's market work whereas a higher wife's wage increases childcare time and housework by husbands. They also showed parental time has a strong response to changes in own wages: higher wages increased market work and reduced housework and childcare both for mothers and for fathers. These results may be specific to France, as Connelly and Kimmel (2009) used the ATUS and found little effect of one's wages, employment hours and time use upon spouse's unpaid time use in the US when young children are present. Also in the US, Datta Gupta and Stratton (2009) noticed a spouse with higher relative earning power enjoys more leisure on weekdays. Hersch and Stratton (2002) and Hersch (2009) questioned the common assumption of exogeneity of hourly wages, showing wages decline with the amount of time spent doing housework, a finding with important implications for gender equity.

In addition to earning power, other spousal characteristics influence the allocation of time. Becker's theory of marriage (1973) and his theory of the gender division of labor within families (1991) predict individuals with certain patterns of similar and dissimilar traits will marry. Positive assortative mating, the matching of individuals with similar characteristics, is expected across age, education, race and religion. Negative assortative mating is expected for traits that permit higher gains from specialization, such as wages and hours worked. While gains from specialization create an incentive for higher wage men to marry lower wage women, the opposite can hold when there are complementarities and household goods are shared in the home (Lam 1988). Furthermore, prospective couples may match by characteristics that are difficult to observe, such as preferences over future children, attitudes towards traditional gender roles, love of animals, political views, etc. No matter how partners are matched, they tend to specialize after marriage. A transition from cohabitation to marriage is accompanied by increased specialization by men toward market work and by women toward home-based activities (El Lahga and Moreau 2007).

Factors outside the household also play a role in the bargaining between spouses that can determine the allocation of time by married couples. Among these are the outside options each spouse has in terms of divorce and remarriage, from the number of single men and women surrounding the household (Grossbard-Shechtman 1993) to the relevant religious customs and divorce laws (Grossbard-Shechtman and Neuman 1998). Spouses' time allocations may be related to a preference for joint leisure or to scheduling around childcare activities: couples may coordinate their decisions in order to enjoy leisure time together, but children reduce these opportunities (Hamermesh 2002). An exogenous income loss such as unemployment of one spouse may lead to a reallocation of domestic tasks among family members (Solaz 2005). Choices of leisure versus work are affected by weather: we do more work on rainy days in order to have more time for leisure on sunny days (Connolly 2008). Finally, social norms may play an important role in our choices of daily activities. Burda et al. (2007) found men and women, married and unmarried, do the same amount of total work (market plus home) on average. The authors speculated peer pressures mute market incentives and weaken the

impact of individual tastes, and the resulting time use becomes highly similar across individuals.

3 Data sample

3.1 Sample selection

The data are drawn from the American Time Use Survey (ATUS) 2003–08, a survey conducted by the Bureau of Labor Statistics.⁴ There, respondents fill out a retrospective time diary describing each activity over a 24-h day. Activities are coded into detailed categories. For most of the activities, both the location and who else was present are also available. The survey contains the household roster and the demographic and labor market information for the respondent and all other household members, including their age, education, employment, earnings, usual hours of work per week and the like.

One issue with the ATUS survey design is it collects only one diary from any household. Rather than having any paired observations from married couples, I proxy married couples as the mathematical union of the married men and the married women in the survey.

My sample includes adults aged 22–65, either single and living apart from any other adult or legally married and living with their spouse and no other adults. This paper is concerned with estimating the gains from a legal marriage where community property rights are respected. Since ATUS does not query respondents as to their legal ties with their roommates, I must exclude all roommates, including those who live in a “common law” marriage. Also, since same-sex marriage is not yet legal except in few circumstances, I end up excluding same-sex couples.⁵ I also exclude diaries entered on holidays or with more than 1 h of missing data. The final sample consists of 18,729 men and 23,625 women.

The total daily time of each respondent (1,440 min) is categorized as follows:

Work for pay

- working, commute, work-related activities, other income-generating activities

Household production

- food preparation—grocery shopping, preparing and serving meals
- housework—household maintenance, cleaning and repairs
- errands—shopping for non-food, care of adult household members and others, household management, buying household and government services, pet care

⁴ ATUS is an ongoing annual survey with over 85,000 interviews over 6 years. Its respondents are a subset of households which have finished their last rotation in the Current Population Survey. For a complete description of the survey see <http://www.bls.gov/tus/>. See Hamermesh et al. (2005) for an overview and discussion of ATUS.

⁵ Grossbard-Shechtman and Jepsen (2008) suggest that non-traditional households may require a separate analysis.

- primary childcare—physical care, reading, playing, arts and crafts, talking, listening, helping, teaching, organizing, planning, supervising, attending events, waiting, picking up or dropping off

Note: the term “total work” refers to the sum of work for pay time and household production time.

Active leisure

- television watching
- all other leisure—socializing, recreation, education, attending events, telephone conversations, volunteering, religious and civic activities, computer use, hobbies, relaxing, using personal services (medical, haircut)

Personal time

- sleep, personal care, eating at home and away from home

All times amounts include any related transportation time.

Each household production activity satisfies the “third party criteria”; namely, each can be outsourced to a third party or replaced with a perfect substitute in the market. Such outsourcing is not possible with the activities listed under leisure or personal time.

The assignments made here are occasionally discretionary, especially for activities that can be considered to have a leisurely component. Examples include gardening and business entertainment. As for meals, the preparation of meals falls within “work” while eating meals is within “personal care.”

With evidence that childcare is meaningfully distinct from both home production and leisure (Kimmel and Connelly 2006), I consider childcare to be a distinct activity in my regression analysis.

The other problematic issue with these data is that respondents are not asked if they own or rent their housing, nor do they provide the size of their housing in square feet. It is clear those who own their own home have a much higher incentive to work on repairs/home improvement projects than renters,⁶ and a larger home requires more of these tasks than a smaller one. Finally, there is the issue of multitasking, where the full duration of a multitasked activity is understated by the diary. This is especially true with childcare, as parents often combine childcare with other activities, and is more likely to affect the diaries from women, who do more of the work in the home. To account for this issue, I divided my sample into two distinct groups, namely those with and without children in the home.

3.2 Sample descriptive statistics

As seen in Table 1, 64% of female and 71% of male respondents are married. Approximately 70% of married adults live in households with children. Single parents account for 41% of single women and 12% of single men. Employment is the highest among married men, 90%, and lowest among married women, 69%.

⁶ A famous saying goes “Nobody ever washed a rental car.”

Table 1 Sample means and standard deviations, ATUS 2003–08

Sample size:	Men		Women	
	Single 5,363 Mean (SD)	Married 13,366 Mean (SD)	Single 8,454 Mean (SD)	Married 15,171 Mean (SD)
Employed	0.80 (.4)	0.90 (.3)	0.76 (.43)	0.69 (.46)
Hourly wage, employed	21.3 (13.7)	24.7 (15.9)	18.3 (13.2)	19.6 (15.3)
Hours of work, employed	44.2 (12.1)	46.5 (11.8)	40.2 (11.2)	36.4 (12.9)
Spouse employed		0.67 (.5)		0.87 (.3)
Age	44.0 (11.27)	42.9 (10.3)	43.9 (11.9)	41.5 (10.6)
No high school diploma	0.08 (.28)	0.07 (.26)	0.10 (.3)	0.07 (.25)
High school diploma	0.56 (.49)	0.51 (.47)	0.57 (.48)	0.53 (.49)
College degree	0.23 (.42)	0.25 (.43)	0.21 (.41)	0.27 (.44)
Advanced degree	0.12 (.33)	0.16 (.37)	0.12 (.33)	0.13 (.34)
African American	0.18 (.38)	0.07 (.25)	0.24 (.43)	0.06 (.24)
Asian	0.02 (.15)	0.03 (.18)	0.02 (.14)	0.04 (.2)
Other race	0.02 (.14)	0.02 (.14)	0.03 (.16)	0.02 (.13)
Hispanic	0.11 (.31)	0.11 (.31)	0.10 (.3)	0.11 (.32)
Northeast	0.18 (.39)	0.18 (.39)	0.18 (.39)	0.17 (.38)
Midwest	0.26 (.44)	0.27 (.44)	0.26 (.44)	0.27 (.44)
West	0.22 (.41)	0.22 (.41)	0.19 (.39)	0.22 (.41)
Weekend day	0.51 (.5)	0.50 (.5)	0.52 (.5)	0.51 (.5)
Metropolitan residence	0.95 (.21)	0.93 (.25)	0.95 (.21)	0.93 (.26)
Children present	0.12 (.33)	0.70 (.46)	0.41 (.49)	0.68 (.47)
Number of children, if present	1.48 (.7)	2.00 (.93)	1.77 (.97)	1.99 (.93)
Year 2004	0.14 (.35)	0.18 (.38)	0.15 (.36)	0.17 (.38)
Year 2005	0.15 (.35)	0.16 (.36)	0.16 (.36)	0.16 (.36)
Year 2006	0.16 (.37)	0.14 (.35)	0.16 (.37)	0.15 (.36)
Year 2007	0.15 (.36)	0.13 (.34)	0.15 (.36)	0.14 (.34)
Year 2008	0.18 (.39)	0.14 (.35)	0.16 (.36)	0.14 (.34)
Household annual income	40922 (34908)	70423 (47772)	31972 (28826)	68348 (46646)
Low income	0.32 (.47)	0.24 (.43)	0.45 (.5)	0.25 (.43)
Total daily work, hours, low income group	5.3 (4.5)	7.8 (4.4)	6.9 (4.3)	7.9 (3.9)
Total daily work, hours, high income group	7.6 (4.3)	8.4 (4.3)	7.9 (4.1)	8.3 (3.8)

Sample design: single and married men and women ages 22–64 with and without children, non-disabled, non-missing information on time use, no other adults present in the household

Average hourly wages among employed adults range \$18 for single women to \$24 for married men.⁷ Employed men work an average 44–46 h per week, and employed women work 36–40 h per week. Married adults in this sample are more educated than single adults. African Americans are overrepresented among single adults. One-half of the diaries in the sample represent weekend days, as intended by the survey design. The racial, geographic and educational composition of the study sample is highly representative of the US population.

For each adult in the sample, their total household income was imputed from their reported weekly earnings and weeks worked per year for all in their household, and was then checked against the mid-point of the ATUS income bracket; the higher of the two numbers was chosen to be the household's annual income. The sample was then divided into two groups based on income. Respondents with a household income below twice the poverty threshold⁸ were placed in the so-called "lower-income" group, and the rest were placed in the "higher-income" group. The average household incomes were \$12,487 and \$77,290, respectively, for the lower- and higher-income groups. The term "higher-income" is a bit misleading, as fully two-thirds of the sample, and of the US population at large, are "higher-income" by this definition.

Married men and women were less likely to be in the lower-income group. Only one-quarter of married adults live in lower-income households, while among single adults 32% of men and 45% of women are lower-income.

Higher-income men and women spend more time working at home and away from home than do lower-income men and women. In both income groups, married adults work in total more hours than their single counterparts do, and women work more in total than men do.

Figure 1 illustrates the average time use on weekdays and weekends for single and married adults in our sample. One important observation is married couples spend more time in household production and less time in leisure and personal care than single adults do. For example, on a typical weekday, an average married man devotes 2.5 h to unpaid work, and an average single man spends 2 h in the same activities. An average married woman spends over 5 h in household production compared to 3.3 h for a single woman. On weekends, married adults spend at least 1 h more in housework than do their single counterparts. By adding the married man and married woman's average hours of work at home and comparing it to the sum of the average single man and single woman's same hours, I infer married couples spend 4.4 h more in housework on weekdays and 2.3 h more weekends. Total work for pay decreases slightly with marriage, as married women reduce their paid hours by 1.3 h on weekdays and 0.5 h on weekends while husbands add 1.1 h to paid work weekdays and reduce weekend work by 0.1 h. On average, the total work time of a married person exceeds the total work of his or her single counterpart. These averages are computed over important underlying differences between the groups, in particular the fact married couples are more likely to have children and thus more housework and more childcare tasks to perform.

⁷ Wages, earnings and incomes are converted to 2008 dollars using the CPI from www.bls.gov.

⁸ Poverty thresholds can be found at <http://www.census.gov/hhes/www/poverty/threshld.html>.

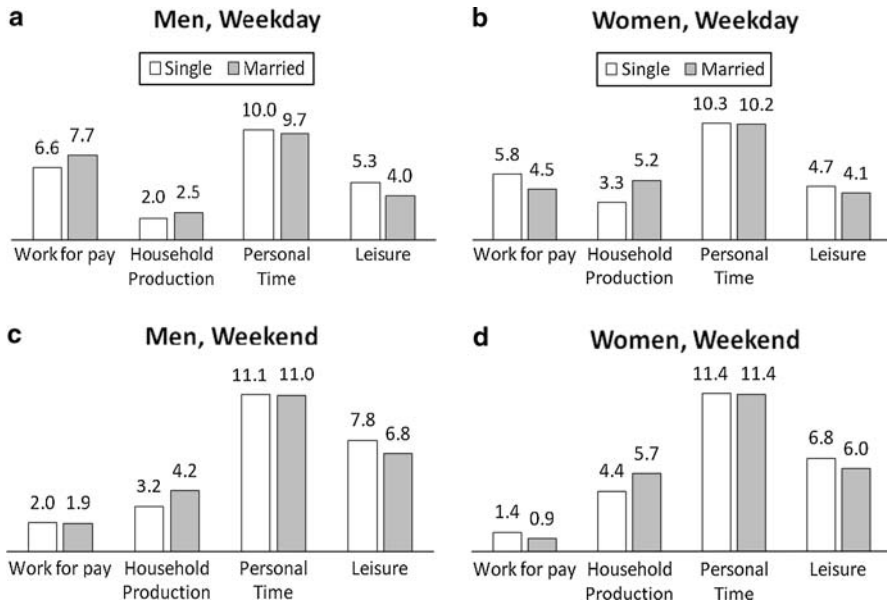


Fig. 1 Time use of single and married adults. Sample average hours per day

Figure 2 offers a more detailed view of household production and leisure illustrating average daily duration, in minutes, of four household production activities: preparing food, housework, errands, and childcare, and two leisure categories: watching TV and other leisure. Here, the sample is split into families with and without children and pooled over days of the week. BLS-provided weights ensure that the sample reflects the US population on a representative day of the week.

As seen in these bar charts, married men and women spend more time in each subcategory of household production than their single counterparts, with the exception of food preparation time by men. Not surprisingly, childcare is the most time consuming responsibility for parents. Married mothers spend more than 2 h per day in primary childcare, 30 min more than the time single mothers spend and more than double the time all fathers spend with their children. The presence of children increases the specialization of work within married couples. Following the birth of a child, married men reduce their unpaid work and replace it with childcare, and married women increase their housework and reduce their errands. Single fathers spend more time in unpaid work than married fathers, and single mothers spend less time in unpaid work than married mothers. Married couples, especially parents, spend less time in leisure, both TV and non-TV, when compared to their single counterparts.

Figure 3 is a series of graphs illustrating the pattern of activities during typical weekdays. Between study groups, namely the interaction of marital status and the presence of children, the largest differences are in work with smaller differences in leisure and in personal care. Married fathers are more likely to be working at each

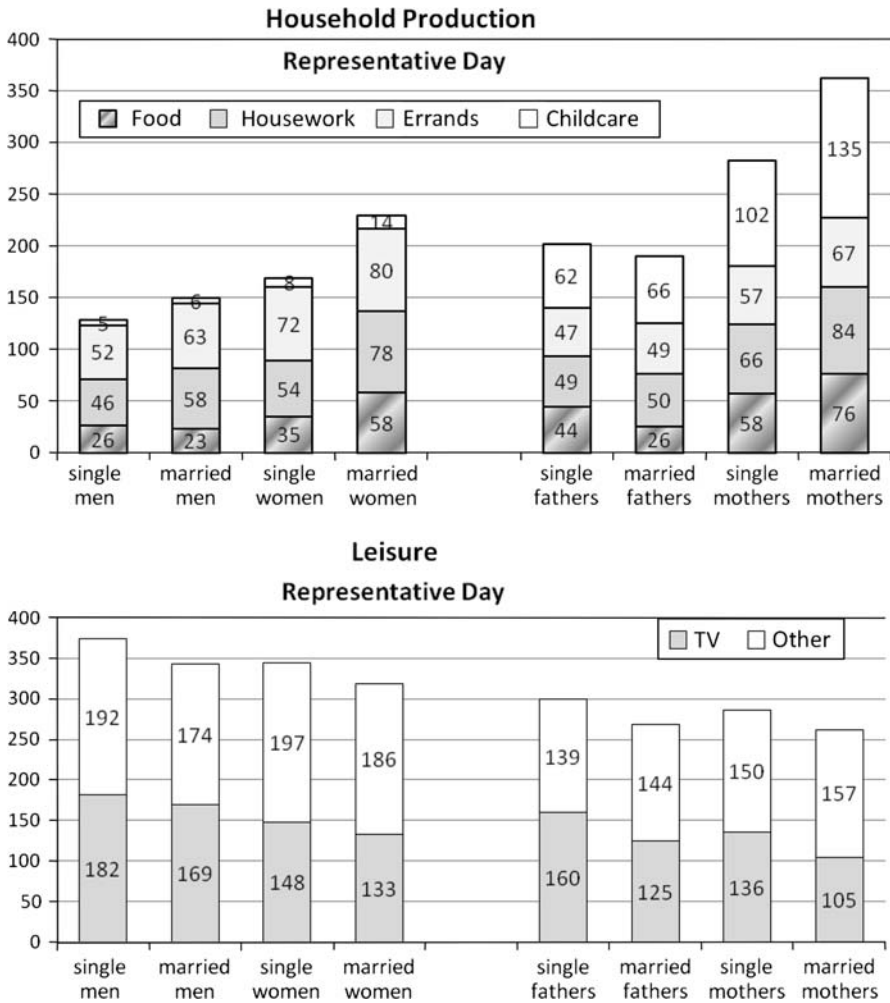


Fig. 2 Household production and leisure activities on a representative day. Weighted means, minutes per day

hours of the day, including evenings, than other men. Single men with no children are less likely to be at work at each hour than married men and men who have children. Among women, the opposite holds. Single women are more likely to be working for pay each hour of the day than married women, and married mothers work less for pay than any other group of women. Household production peaks in the early evening, between 5 and 7 p.m., and leisure peaks from 8 to 10 p.m. The leisure graphs illustrate the negative effect of children on parental leisure; this effect is particularly strong for married fathers.

Figure 4 illustrates the average time use for the lower- and higher-income subsamples. The largest differences are in work for pay and in leisure. Lower-income men work less in total, namely for pay plus at home, than higher-income

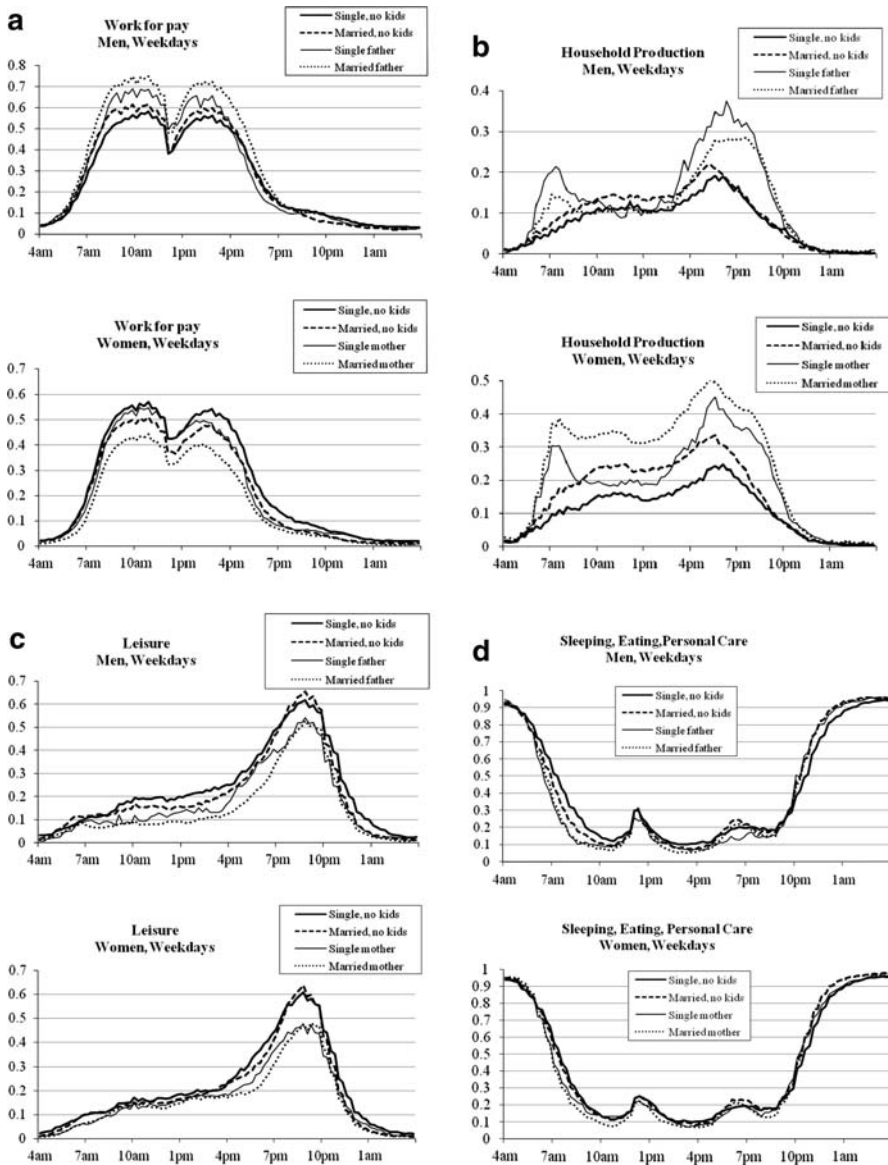


Fig. 3 **a** Work for pay on weekdays. All graphs in this picture shares of respondents who perform at least 5 min of the activity during every 15 min interval throughout the day. **b** Household production on weekdays. **c** Leisure on weekdays. **d** Personal time on weekdays

men. For example, among unmarried adults, a lower-income man spends only 3.5 h at work for pay and 2.1 h in household production each weekday, compared to 6 h for pay and 2.3 h of housework for a higher-income man. Lower-income women also work less for pay when compared to higher-income women, but they devote

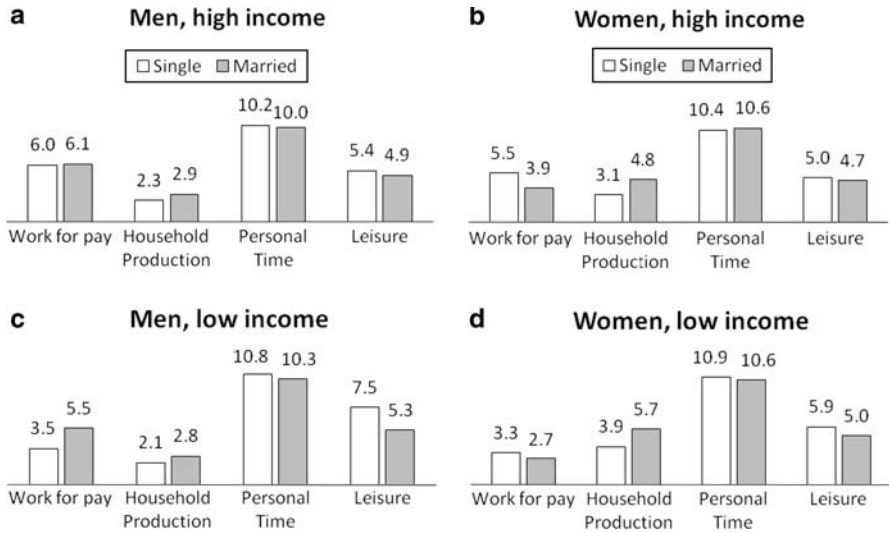


Fig. 4 Average time use on a representative day by income group, weighted means, hours per day

more time to unpaid work. An average lower-income woman spends 3.3 h on work for pay and 3.9 h on housework each weekday, and average higher-income woman spends 5.5 and 3.1 h, respectively. Marriage increases the work of lower-income men by 2 h of work for pay and one-half hour of housework. Higher-income men work an additional 0.1 h for pay and 0.6 h at home. Each group of women increase nonmarket work and comparably reduce market work after marriage, with total work the same as for singles of 8.6 h each weekday for higher incomes and 7.4 h for lower incomes. Married couples from each income group spend more combined time on housework than if two singles.

4 Marriage, work and leisure

4.1 Regression model

According to the theory of household production, an individual's allocation of time to various activities depends upon the opportunity cost of time, preferences for goods versus leisure, relative prices of purchased goods, and any unearned income. Empirically, the time allocated to an activity k , T_k , is expressed as a function of observable characteristics X of the individual, where X includes wages and income, demographic factors, and exogenous variables specified below. The data used here do not contain precise measures of total household income, rather income brackets and weekly wages and weeks worked of the single respondent alone. Instead of household income, I use my classification of lower-/higher-income based on the income bracket corresponding to twice the federal poverty level. A dummy variable for presence of a *Spouse* is the marriage effect of interest.

Each respondent has 24 h to allocate to market work, housework, childcare (for parents only), leisure and personal care. In the regressions “personal care” is omitted as the collinear variable. The equations are estimated as a system of Seemingly Unrelated Regressions Tobit models,⁹ accounting for correlations of error terms across the differing time uses on any given day and for the non-negativity of the observed outcome.

$$T_k^* = \alpha \text{Spouse} + \beta X + \varepsilon \quad k = \text{total work, household production, childcare, leisure}$$

$$T_k \text{ is observed if } T_k^* > 0$$

$$T_k = 0 \text{ if } T_k^* < 0$$

These sets of equations are estimated separately for men and for women, and further split by income level, by the presence of children, and by weekday/weekend diary entry.

Vector X includes: *age*, *age-squared*, *race* (African American, Hispanic, Asian, Other Race), *geographical area* (Northeast, Midwest, West), *non-rural residence*, *day of the week* (Friday in weekday, Sunday in weekend), *summer*, *calendar year*, and *the log of the hourly wage* of the respondent. Regressions for families with children also include *the presence of a child age 5 or younger* and *the ratio of children to adults* in the household. In order to avoid correlation of actual wages with unexplained time usage, wages are predicted via a Heckman two-stage method.¹⁰ Neither education nor spousal characteristics are included explicitly in the regressions.

Because the ATUS collects only a single diary for each household, I will interpret the sum of the regression coefficients on *Spouse* in time use for men and women to reflect the marriage effect when compared to two single adults living apart. If marriage allows men or women to reduce their household production or market work in favor of leisure, the regression coefficients on *Spouse* will be negative in the *Household Production/Total Work* equations and positive in the *Leisure* equation.

Estimates of the effects of a *Spouse* should be interpreted with care because this exercise assumes the marital status is exogenously determined. In reality, marital status may be correlated with preferences for market work versus household production. If men and women who enjoy housework are more likely to marry, then

⁹ A similar technique, with variations, is used by Kalenkoski et al. (2005), Kimmel and Connelly (2006), Bloemen and Stancanelli (2009).

¹⁰ The Heckman participation and log wage equations are estimated over all employed individuals from the CPS-ATUS sample, which is a much larger sample that includes observations on over 160,000 individuals over 7 survey years. Log wage and participation regressions include the following controls: age, age-squared, indicators for black, Hispanic, 4 education dummies, married and never married status, indicators for a non-US citizen, a naturalized citizen (to account for difference in English language skills that might impact employment and wages), metropolitan residence, region dummies, year of the survey dummies, local monthly unemployment rate. The employment participation equation is identified by the inclusion of the presence and number of children by age groups, and the student status. According to these estimates, married men are 32% more likely to be employed, with marriage wage premium of 10%. Marriage decreases women's probability to be employed by 23%, but women's marriage wage premium is also positive, 6%.

the coefficient on *Spouse* will overstate the true marriage effect because of the selection bias of marriage. If, instead, men and women who believe in traditional gender roles are more likely to marry, then the marriage coefficient for husbands in the household production regression will show a larger decrease than without the selection bias. The coefficients on *Spouse* are likely to reflect unspecified factors correlated with marital status. For example, married adults may be wealthier and able to afford more household services than single adults, but differences in assets other than household annual income are unobserved, and therefore the *Spouse* coefficient may capture this wealth effect.

4.2 Childless adults: does living together save time?

Table 2 reports the estimates of the unconditional marginal effects on the variables of interest, for men and women and from families with and without children. Among lower-income childless adults, the coefficients on *Spouse* are highly significant and positive in the *Total work* regression. Here, men work 79 min more each weekday and 37 min more each weekend day, and women work 48 min more each weekday and 37 min more each weekend day. These marriage effects sum to more than 2 h total of additional work each weekday. Married men spend this time on paid work and women reduce their paid work and devote the remainder to housework. The work increases at the expense of leisure: lower-income childless married men spend 52–73 min less in leisure each day compared to their single counterparts, and lower-income childless married women spend 33–47 min less each day.

In contrast, higher-income couples save time in total work and enjoy more leisure after marriage. Men spend as much time in total work as single men, whereas women work 33 min less per weekday than single women. Women reduce their work for pay by almost one and one-half hours each weekday and over 30 min each weekend day, adding 33–51 min more to housework when compared to single women. Higher-income married men add 18 min to household production each weekend day, with no change in weekday in housework when compared with singles. The regression coefficients suggest married women spend their extra 33 min each weekday in personal care. Interestingly, higher income childless men as a group of adults who experience the smallest changes in time use as a result of marriage; their total work time and leisure time are virtually unchanged.

4.3 Married versus single parents: does living together save time?

In the top-right panel of Table 2, lower-income married parents work more in total and enjoy less leisure than single lower-income parents. These parents work 34–39 min more each weekend day, with mothers devoting extra time to housework and childcare and fathers to paid work. Lower-income parents may increase their total work by 15–27 min on weekdays as well, but the regression coefficients are not statistically significant. The household production regressions reflect higher degrees of specialization among couples with children when compared to childless couples. A lower-income married father spends 21–43 min less each weekday in housework

Table 2 Estimated marginal effects of the presence of a spouse on time use

	No children			Children present		
	Men	Women	Sum	Men	Women	Sum
Low income						
Total work						
Weekdays	78.8***	47.9***	126.7	26.8	14.9	41.7
Weekends	36.7*	36.6***	73.3	48.7*	33.5***	82.2
Household production						
Weekdays	-4.5	66.2***	61.7	-42.9**	97.5***	54.6
Weekends	11.8	34.2***	46	-20.8	42.5***	21.7
Childcare						
Weekdays			0	-40.7***	21.9***	-18.8
Weekends			0	-0.6	20.3**	19.7
Leisure						
Weekdays	-73.2***	-47.2***	-120.4	-31.9	8.3	-23.6
Weekends	-52.3***	-33.2**	-85.5	-19.3	-10.4	-29.7
<i>N</i> obs						
Weekdays	1,146	1,372		1,269	2,259	
Weekends	1,075	1,390		1,336	2,462	
High income						
Total work						
Weekdays	6	-33.1***	-27.1	7.5	-33.7***	-26.2
Weekends	7.6	-0.9	6.7	-7.4	13.1	5.7
Household production						
Weekdays	-7	51.2***	44.2	-10.7	88.8***	78.1
Weekends	17.6**	32.7***	50.3	-36.6**	17.9**	-18.7
Childcare						
Weekdays			0	-19.3**	56.4***	37.1
Weekends			0	-0.4	18.8***	18.4
Leisure						
Weekdays	-4.9	3.5	-1.4	-13.1	33.8***	20.7
Weekends	-8.1	-11.2	-19.3	3.2	-7.7	-4.5
<i>N</i> obs						
Weekdays	3,342	3,614		3,647	4,433	
Weekends	3,270	3,630		3,643	4,464	

Correlated Tobit regressions—dependent variables: minutes of time use

Other controls not shown: predicted wage of the respondent, age, age-squared, indicators for race, region, year of the survey, Friday or Sunday dummy, presence of child age 5 or younger, ratio of children to adults, summer, metropolitan residence

Total work includes market work, household production, and childcare

Household production does not include childcare

* Significant at 10%; ** significant at 5%; *** significant at 1%

and 41 min less in childcare than a similar single father does. In turn, lower-income married mothers work 1.5 h more in household production weekdays and 43 min more weekend days compared to single mothers. These mothers also spend 20 min more each day in childcare compared to single mothers. Childcare tasks performed by mothers save couples 19 min each weekday, based upon the sum of the regression coefficients for men and women. Men reduce work at home and leisure to spend more time in paid work, and women sacrifice sleep for domestic tasks.

As for higher-income households with children, married couples save time in total work and enjoy more leisure than as single parents. Married mothers work 34 min less in total each weekday and choose to spend this saved time in leisure. Married mothers spend less time in work for pay and instead spend an extra 1.5 h in household production weekdays and 18 min weekend days, and also spend almost 1 h more in childcare each weekday compared to single mothers. There are no significant differences in the amount of total work or of leisure between married and single fathers, although the composition of total work of fathers is affected by the presence of a spouse. Marriage allows fathers to specialize in market work and to spend 19–37 min less in unpaid housework and childcare, compared with single fathers.¹¹ Combined, married parents save 19 min in household production on weekend days when compared to two single adults, using this saved time for childcare.

In contrast to childless couples who spend more time in housework and childcare than two single adults apart, marriage allows parents to save time in either childcare (lower-income couples) or household production (higher-income couples). This suggests that parents gain more from marriage than do adults with no children.

4.4 Other exogenous factors

In addition to the marriage effect, gender and income level, other demographic/exogenous variables were included as controls. Hourly wages are positively related to men and women's total work, with one exception of weekend hours of total work by higher-income adults. In families with no children, wages increase the housework of lower-income men, increase the weekend housework of lower-income women and higher-income men, and reduce the weekday housework of higher-income men and women. In families with children, wages reduce household production time, except for lower-income men who are unaffected. Childcare strongly increases with wages for mothers and fathers. Wages are negatively related to leisure on weekdays for all men and women.

African-American men and women report less work, household production and childcare time than white men and women. Hispanic men with no children work more for pay and spend less time in leisure than white men. Hispanic mothers from lower-income families spend more time in household production compared to white mothers. Hispanic mothers and fathers spend less time in primary childcare and leisure than their white counterparts. Asian men spent less in household production,

¹¹ This result is consistent with Kalenkoski et al. (2005), who find single fathers spend more time in primary childcare than married fathers.

childcare and leisure than did white men. Lower-income childless men from “Other Race” spent less time in work and household production, and more time in leisure, when compared to white men.

The presence of preschool children increases the time spent in household production of mothers, the time spent in childcare and total work of both parents, and reduces leisure for both parents, with the exception of lower-income fathers whose time spent was unaffected. Replacing the children controls with a child–adult ratio did not materially change the estimates of parental allocation of time.

In the South, higher-income parents and both lower-income childless women and higher-income childless men report less household production than their counterparts in other parts of the country. In urban areas, lower-income men with no children and higher-income mothers report less total work and more leisure than their rural counterparts. Higher-income urban parents spend more time with their children than do non-urban parents, all else equal.

Weekday and calendar effects are as expected. Higher-income childless adults and all parents work less for pay on Fridays and spend more time in leisure and household production. Mothers spend less time in primary childcare Fridays. The childcare time of fathers does not vary by day of the week. All adults work an average 1 h more Saturdays when compared to Sundays, with women more likely to spend this extra time on household production and men on paid work. By season, all parents spend less time in primary childcare in the summer, and as a result mothers spend less time in total work and more time in leisure during the summer.

4.5 Details on household production and on leisure

In order to understand the non-market-work changes associated with marriage, I examine sub-categories of household production (food preparation, housework, errands) and leisure (watching TV, all other leisure). Table 3 presents the marginal effects from the Tobit regressions of these categories on the same set of controls. The food regression shows married men overwhelmingly outsource cooking to wives. Married men spend 14–52 min less between food shopping and cooking weekdays and 4–23 min less weekend days when compared to single men, the largest change among lower-income fathers. Women not only pick up these differences, they contribute further to shopping and cooking and the couple together spends more time in food preparation than two single adults, with the only exception of lower-income parents who save 2 min on food-related tasks.

Married women spend 19–42 min more weekdays in house cleaning and up to 14 min more on weekend days compared to single women, while men’s contribution to cleaning and repairs remains unchanged. In childless families, the total time spent shopping, paying bills and running errands is unchanged by the presence of a spouse. But, married mothers spend 8–11 min more in these activities weekdays and higher-income married fathers spend 20 min less, when compared to their single counterparts. Together, higher-income married parents save 27 min in errands on weekend days compared to single parents.

Leisure activities change in marriage. Among lower-income adults with no children, marriage reduces TV-watching and other leisure, both for men and for

Table 3 Estimated marginal effects of the presence of a spouse on time use (Tobit regressions)

	No children			Children present		
	Men	Women	Sum	Men	Women	Sum
Low income						
Household production						
Food						
Weekdays	-31.7***	36.0***	4.3	-52.0***	49.8***	-2.2
Weekends	-3.7	19.2***	15.5	-22.5***	27.8***	5.3
Housework						
Weekdays	8.4	27.5***	35.9	-2.9	41.6***	38.7
Weekends	4.5	13.6**	18.1	5.9	10.0*	15.9
Errands						
Weekdays	-2.3	0.8	-1.5	-7.5	7.9**	0.4
Weekends	-1.6	-5.7	-7.3	-4.9	2.8	-2.1
Active leisure						
Watching TV						
Weekdays	-4.8	-18.0**	-22.8	-28.8**	-1.8	-30.6
Weekends	-20.1	-12.4	-32.5	-48.2**	-26.0***	-74.2
Other leisure						
Weekdays	-50.5***	-23.7**	-74.2	3.2	10.1	13.3
Weekends	-40.0**	-10.9	-50.9	39.6**	19.8**	59.4
High income						
Household production						
Food						
Weekdays	-13.8***	34.9***	21.1	-29.1***	41.0***	11.9
Weekends	-3.9**	14.3***	10.4	-19.8***	20.8***	1
Housework						
Weekdays	-2.5	18.5***	16	-0.3	31.0***	30.7
Weekends	7.3	11.0***	18.3	-1.3	-2.1	-3.4
Errands						
Weekdays	1.4	0.6	2	-0.5	11.4***	10.9
Weekends	3.7	-0.1	3.6	-19.6**	-7.5	-27.1
Active leisure						
Watching TV						
Weekdays	9.2*	6.1	15.3	-1.6	5	3.4
Weekends	-2.1	-7.7	-9.8	3.4	-17.1***	-13.7
Other leisure						
Weekdays	-12.0**	-3.5	-15.5	-5	27.0***	22
Weekends	-4.6	0.7	-3.9	-5.6	11.3	5.7

women. Men's social activities and hobbies decrease by 40–50 min weekdays, and TV-watching decreases by 20 min each weekend day. Women's weekday social activities decrease by 24 min and watching TV by 18 min. Higher-income men

reduce their social leisure by 12 min and spend 9 min more in front of the TV after marriage, and wives' leisure composition does not change with marriage. Lower-income married fathers spend 29–48 min less watching TV daily and 40 min more in more active leisure on weekends compared to single fathers. Low income married mothers also reduce TV-watching by 26 min and increase active leisure by 20 min on weekends, compared to single mothers. Among higher income parents, marriage does not change fathers' leisure composition, whereas mothers reduce TV time by 17 min on weekends and increase other leisure by 27 min on weekdays.

4.6 Who benefits more from economies in time, men or women?

Specialization according to traditional gender roles changes the composition of total work between paid and unpaid tasks for men and women in marriage. The division of labor further increases with children, so that married mothers bear the largest burden of household tasks and married fathers work the longest hours for pay. At the same time, marriage leads to a more equal distribution of total work among men and women. Unmarried women work more than men do: in my sample, low- and high-income single women spend on average 6.9 and 7.9 h in total work per day, respectively, compared to 5.3 and 7.6 h for single men. In marriage, low-income men see a larger increase in total work than do low-income women; and higher income wives reduce total work while their husbands do not. Even though more equitable distribution of work and leisure should be celebrated, the impact of specialization may be ambiguous in the long run. On the one hand, specialization according to comparative advantage is efficient; both spouses gain more goods and services than two single adults apart. On the other hand, specialization of women in domestic tasks may arise as a outcome of household bargaining in which men have an advantage due to their higher incomes. Men's higher incomes allow them to purchase more home production services of women (Grossbard-Shechtman 1984). In the long run, specialization in household production hurts women's career prospects, reduces their wages, creates dependence on husband's income and even prolongs unhappy marriages.

4.7 Why do couples spend more time in household production than single adults?

Across household types, there is far less saving of time in other household production tasks as there is for childcare. One possible explanation is married couples choose to substitute household production for commercial services, taking advantage of a lower per capita cost of time and/or a scale effect in the numbers of workers present. If this were true, a comparison of the expenditure patterns of single and married adults would reveal lower per capita spending by married couples on goods and services for which homemade substitutes are available. To test this, I compiled annual expenditure data from NBER Consumer Expenditure Survey

¹² These data and description are available at: http://www.nber.org/data/ces_cbo.html Sample characteristics and methodology are described in "Appendix".

Family-Level Extracts 2002–03¹² to show the average married couple spent \$1,371 less on food, \$5,848 less on housing, furniture and maintenance, \$643 less on transportation, and \$1,588 less elsewhere when compared to two single adults living apart. Most of these items are either household public goods (furniture) or goods that do not have close homemade substitutes (housing and transportation), which means a large portion of the couple's monetary savings is due to shared expenses rather than substitution towards household production.

Food, though, is a private non-sharable good for which a homemade substitute is available. Therefore, the amount of money a couple saves on food can be used to estimate the marginal value of household production time. Suppose one-half of the couple's annual savings on food (\$685) was from buying in bulk and better managing waste, and one-half the result of eating fewer restaurant meals. In Table 3, an average higher-income married couple spends extra 11.9–21.1 min each day cooking on weekdays and 1–10.4 min on weekends, or 53.3–109.5 h per year. The savings of \$685 corresponds to a marginal productivity of \$6.26–\$12.85 per hour, or above minimum wage at the time of the survey and around the prevailing market wage for household help. The actual productivity of home food preparation time is higher if the economies from lower unit prices and waste management are smaller than assumed or if food consumption increases with marriage.

The other explanation for why a married couple spends more total time in household production than their two single counterparts would be the married couple lives in a bigger residence with a bigger yard. Married adults are more likely to own their homes as opposed to renting them, increasing their incentives for housework and repairs. Unfortunately, ATUS does not collect information about the residence size or ownership status. Another issue is the data tell us nothing about the pace of work. Singles may do their housework quickly in order to leave the house to socialize, and couples may instead do their housework at a more relaxed pace, socializing instead with the people they have chosen to live with. It is even possible married couples enjoy doing any activities together and view home improvements as leisure.

5 Discussion

The most important result here is the estimate of an increase in leisure time for women in marriage of 33–34 min with controls in place for the presence of children. Cohabitation enables economies in housework, meal preparation and childcare, and community property rights enable a highly specialized outcome where one spouse stays home while the other works for pay. This increase in leisure time is unambiguously welfare-improving and compounds the financial benefits of marriage (e.g., savings in housing, energy and food costs) to increase economic benefits of marriage for women. When combined with many advances in women's rights under family law, from better alimony awards to improved collection of child support payments, the economic benefits of marriage for women would appear, at first glance, to be increasing. Instead, the prevalence of marriage is in a prolonged decline. This trend is not due to divorce; in the US, the divorce rate peaked in 1981 and has declined substantially since (Stevenson and Wolfers 2007). Rather, fewer

adults are getting married and if they do, they marry later in life. Why are fewer people getting married today? As our society has liberalized, many social morays serving to coerce women into marriage have faded. So-called “arranged,” “honor” and “shotgun” marriages are almost extinct. Gay men and women no longer must marry in order to have children or even to adopt. Women’s rights have reduced the rate of unhappy marriage and decreased the need for divorce. An increase in the professional opportunities for highly educated “career women” has resulted in an increasing number of women for whom the opportunity costs of marriage and children, namely a suspension of their careers, is very high. If women are simply waiting longer before marrying, then this effect alone could cause the incidence of marriage to decline in cross-sectional data. The issue of timing of marriage highlights the difficulty with relying solely on cross-sectional data to measure effects of choices being made with significant life-cycle implications. It remains for longitudinal data to clarify the rationale behind the choices being made by women.

Marital gains of leisure and the benefits of specialization are foregone in divorce. Following a divorce, a low-income man and woman will work less at home and spend more time in leisure, including watching TV. The man will work less for pay, whereas his former wife will work longer hours outside home. A richer couple would face a different work/leisure tradeoff: Back to being single, the man will do more work around the house and the woman will work more for pay with less time left for leisure. These potential lifestyle changes make divorce unattractive for higher income women who value leisure, higher income men who dislike housework, and for all couples who value tangible benefits of specialization. Couples with children, especially preschool children, would also face dramatic lifestyle changes in divorce. A married mother who becomes a single mother would reduce work around the house by an hour and a half per weekday, and instead work more for pay, while her former husband who becomes a single childless man would experience no change in housework and a small decrease in market work. A married father who becomes a single father would spend up to an hour and a half more per day in childcare and housework, while his former spouse would substitute unpaid for paid work. To the extent that these potential changes are undesirable, they discourage divorce.

As new rounds of the American Time Use Survey become available, the larger sample size and longer time frame will permit an improved analysis of many important questions. We will be able to extend our samples to include cohabiting couples, same-sex partners, and immigrant families. It will be interesting to compare the time gains from marriage in the US with estimates from other countries, in order to examine how they might be affected by public policies such as welfare benefits, unemployment compensation and subsidies for childcare. Finally, the longer time frame will allow us to see how the gains of leisure in marriage change over time and vary with the business cycle.

Table 4 Sample means and OLS estimates of the expenditure equations

	Mean	Food		Housing		Transp		Total	
Mean dependent var, \$:		2427		6920		1817		16462	
Number of observations:		6640		6640		6640		6640	
		Coef.	<i>t</i> -Stat.	Coef.	<i>t</i> -Stat.	Coef.	<i>t</i> -Stat.	Coef.	<i>t</i> -Stat.
Intercept		-350.4	-1.36	-4221.5	-5.17	31.5	0.11	-1614.7	-0.81
Single male	0.16	861.8	15.70	2811.7	16.10	522.3	8.53	5443.9	12.85
Single female	0.20	509.6	10.31	3035.9	19.32	120.9	2.19	4005.6	10.50
Children present	0.42	376.5	5.27	772.0	3.39	310.2	3.89	2340.7	4.24
Number of children	0.83	324.3	11.36	279.0	3.07	11.0	0.35	909.5	4.13
Child age 13–17 present	0.15	180.8	2.70	120.9	0.57	174.5	2.34	842.1	1.63
Child age <5 present	0.19	-424.3	-6.54	-210.0	-1.02	-126.9	-1.75	-1420.3	-2.84
Non-employed hh head	0.36	-444.3	-8.82	-941.4	-5.87	-318.3	-5.66	-2227.9	-5.73
Black household head	0.13	-345.2	-6.34	-576.0	-3.32	-367.1	-6.04	-2249.7	-5.35
Other non-white, head	0.06	-253.1	-3.35	-366.6	-1.53	-185.1	-2.20	-1722.9	-2.95
No high school, head	0.11	-129.1	-2.19	-968.9	-5.17	-391.3	-5.95	-2949.1	-6.48
College degree, head	0.20	495.7	10.76	2140.3	14.60	432.2	8.41	5182.8	14.57
Masters and above, head	0.10	703.3	11.33	3224.4	16.33	772.5	11.16	8076.4	16.86
Student, head	0.08	-283.8	-4.23	-488.0	-2.29	-102.8	-1.38	-1052.6	-2.03
Income per adult (log)	21265	80.0	14.64	237.4	13.66	79.4	13.03	688.9	16.33
Receive food stamps	0.05	-213.5	-2.37	-1323.8	-4.62	-478.4	-4.76	-3549.8	-5.11
Own house w/ mortgage	0.40	791.0	6.40	6523.0	16.58	980.9	7.11	10626	11.13
Own house, no mortgage	0.13	637.7	4.96	4765.8	11.65	593.1	4.14	6703.2	6.75
Rent housing	0.44	217.5	1.84	2170.9	5.77	295.8	2.24	2609.2	2.86
Age, head	39.11	41.9	3.19	103.1	2.47	13.1	0.89	34.6	0.34
Age-squared		-25.3	-1.55	-26.6	-0.51	-0.3	-0.01	144.6	1.15
<i>R</i> -squared		0.32		0.40		0.22		0.36	
Sum of coefficients on single male and single female		1371		5848		643		9450	

NBER extracts from the Consumer Expenditure Surveys 2002–03

Note: Dependent variables are per adult expenditure

Appendix: Calculations based on NBER Consumer Expenditure Survey Family-Level Extracts 2002–03

NBER Consumer Expenditure Survey Family-Level Extracts are annual household-level data derived by linking the four quarterly interviews for each Consumer Expenditure Survey respondent family. The extract contains information on annual expenditures, incomes, household composition and demographics. I select one and two adult families with and without children, so that the final sample contains 6640 households. Mean values are listed in Appendix Table 4. Single headed households account for 36% of the sample. Children live in 42% of the households. Overall the racial and educational composition of the sample is similar to the one found in the time use data and is representative of the US population.

Total expenditure includes food, nonfood, clothing, personal care, shelter, recreation, education, personal insurance, transportation, charity. I also separately examine three major expenditure categories—food, shelter and transportation—in order to compare relative economies in these items. Food expenditure includes food eaten at home and away from home, excluding alcohol. Shelter includes rent or value of owner occupied housing, utilities, household help and 10% of the value of purchased furnishings and appliances. Transportation includes 10% of the cost of new vehicles, gasoline, vehicle maintenance, auto insurance, public and other transportation. While these measurements of expenditures are far from being perfect, for example, they do not include service value of durable goods purchased in previous years, they will still give us a rough idea on how much money an average couple saves by living together.

The following relationship between per adult household expenditure and family composition is estimated:

$$\text{Per Adult Expenditure} = \alpha\text{SingleMan} + \beta\text{SingleWoman} + \gamma\mathbf{X} + \varepsilon.$$

Vector X includes presence and number of children, employment status of the household head, race, education and age of the household head, annual income per adult, and, to refine the income variable further, indicators for low income food stamp recipients and housing ownership status.

The sum of the coefficients on SingleMan and SingleWoman shows how much more a single man and a single woman living apart spend compared to an otherwise similar married couple.

References

- Aguiar, M., & Hurst, E. (2004). Consumption vs. expenditure. NBER Working Paper No. 10307.
- Becker, G. (1965). A theory of the allocation of time. *Economic Journal*, 75, 493–517.
- Becker, G. (1973). A theory of marriage: Part I. *Journal of Political Economy*, 81, 813–846.
- Becker, G. S. (1991). *Treatise on the family*. Cambridge: Harvard University Press. (1981, Enlarged edition).
- Bloemen, H., & Stancanelli, E. (2009). How do parents allocate time? The effects of wages and income, IZA DP No. 3679.

- Briant, W. K., & Zick, C. (2006). *The economic organization of the household* (2nd ed.). Cambridge: Cambridge University Press.
- Burda, M., Hamermesh, D. S., & Weil, P. (2007). Total work, gender and social norms, NBER Working Paper No. 13000, March 2007.
- Chiappori, P. -A. (1997). Introducing household production in collective models of labor supply. *Journal of Political Economy*, 105(1), 191–209.
- Connelly, R., & Kimmel, J. (2009). Spousal influences on parents' non-market time choices. *Review of the Economics of the Household*, 7, 361–394.
- Connolly, M. (2008). Here comes the rain again: Weather and the intertemporal substitution of leisure. *Journal of Labor Economics*, 26(1).
- Crossley, T., & Lu, Y. (2003). Exploring the returns to scale in food preparation (Baking Penny Buns at Home), Institute for Fiscal Studies Working Paper 05/03.
- Datta Gupta, N., & Stratton, L. (2009). Examining the impact of alternative power measures on individual time use in American and Danish couple households, forthcoming in *Review of the Economics of the Household*.
- Deaton, A., & Paxson, C. (1998). Economies of scale, household size and the demand for food. *Journal of Political Economy*, 106, 897–930.
- El Lahga, A. R., & Moreau, N. (2007). The effects of marriage on couples allocation of time between market and non-market hours. IZA DPF 2619, February 2007.
- Gronau, R. (1977). Leisure, home production, and work—The theory of the allocation of time revisited. *The Journal of Political Economy*, 85(6).
- Gronau, R., & Hamermesh, D. (2006). Time vs. goods: The value of measuring household technologies. *Review of Income and Wealth*, 52, 1–16.
- Grossbard-Shechtman, A. S. (1984). A theory of allocation of time in markets for labor and marriage. *Economic Journal*, 94, 863–882.
- Grossbard-Shechtman, S. (1993). *On the economics of marriage: A theory of marriage, labor and divorce*. Boulder, CO: Westview Press.
- Grossbard-Shechtman, S., & Jepsen, L. (2008). The economics of gay and lesbian couples: Introduction to a special issue on gay and lesbian households. *Review of Economics of the Household*, 6.
- Grossbard-Shechtman, S., & Neuman, S. (1998). The extra burden of moslem wives: Clues from Israeli women's labor supply. *Economic Development and Cultural Change*, 46(3).
- Hamermesh, D. (2002). Timing, togetherness and time windfalls. *Journal of Population Economics*, 15(2002), 601–623.
- Hamermesh, D. S., Harley, F., & Stewart, J. (2005). Data watch: The American time use survey. *The Journal of Economic Perspectives*, 19(1), 221–232.
- Hersch, J. (2009). Home production and wages: Evidence from the American time use survey. *Review of the Economics of the Household*, 7, 159–178.
- Hersch, J., & Stratton, L. S. (2002). Housework and wages. *Journal of Human Resources*, 37(1), 217–229.
- Kalenkoski, C., Ribar, D., & Stratton, L. S. (2005). Parental child care in single parent, cohabiting, and married couple families: Time diary evidence from the United Kingdom. *American Economic Review Papers and Proceedings*, 95(2), 194–198.
- Kimmel, J., & Connelly, R. (2006). Is mothers' time with their children home production or leisure? IZA DP 2058, March 2006.
- Lam, D. (1988). Marriage markets and assortative mating with household public goods. *Journal of Human Resources*, 23, 462–487.
- Lazear, E., & Michael, R. (1980). Family size and the distribution of real per capita income. *American Economic Review*, 1, 91–107.
- Solaz, A. (2005). Division of domestic work: Is there adjustment between partners when one is unemployed? Evidence from French Couples. *Review of Economics of the Household*, 3, 387–413.
- Stevenson, B., & Wolfers, J. (2007). Marriage and divorce: Changes and their driving forces. *Journal of Economic Perspectives*, 21(2), 27–52.