THE CHORE WARS:
HOUSEHOLD BARGAINING AND LEISURE TIME

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ABSTRACT

A growing literature offers evidence that the distribution of bargaining power within a household influences household spending decisions. We extend this literature by analyzing time allocated by spouses to leisure and chores. Unlike many other possible outcomes of household bargaining, time use is easy to observe and to assign using data from the new American Time Use Survey. Another problem commonly arising in tests of income pooling is observing threat points. An advantage of the ATUS is that it provides a measure of the hourly wage through its link to the Current Population Survey. Using the hourly wage instead of total earnings as a proxy for threat points eliminates the problem that hours (on the right-hand side) is jointly determined with leisure (on the left-hand side). A final concern in studying time use is that higher wages will influence time use through conventional income and substitution effects, making it difficult to identify a separate bargaining effect of wages. Hence, we control for household income and focus on time use on weekends, when substitution effects from wages should be much smaller. We find evidence that, as wives' wages in two-earner households rise, wives enjoy significantly more leisure – especially socializing with family and friends and watching TV – and spend significantly less time doing chores – especially cooking and cleaning. Notably, they spend significantly *more* time taking care of children as well.

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I. INTRODUCTION

A growing literature offers indirect evidence that the distribution of bargaining power within a household influences decisions made by the household. Models of household bargaining have two important implications for our understanding of individual welfare. First, the welfare of household members depends on the distribution of bargaining power. Second, household decisions cannot be modeled as the outcome of a single agent maximizing utility.

Indirect evidence against "unitary" decision-making links variables that are assumed to influence the distribution of bargaining power within the household to household outcomes. These tests of income-pooling analyze whether the distribution of income between spouses affects outcomes including the amount and allocation of spending (on women's and children's clothes versus men's clothes, on alcohol and tobacco, on food) and children's well-being.[1] In this paper, we use new data on time use to study the impact of household bargaining on the time that spouses spend doing chores and enjoying leisure. Studying time use offers important advantages over other tests of income pooling.

One problem in tests of income pooling is finding outcomes that are assignable – that is, outcomes that clearly increase the utility of one spouse and not the other. Consumption of most goods is difficult to observe (because we have data on expenditure rather than consumption) and to assign (either because it is public in nature or because it is private but is observed at the household rather than the individual level).[2] Time spent on leisure and chores, on the other hand, is easy to observe and to assign using data from the new American Time Use Survey (ATUS). It is also, perhaps, a more interesting outcome in its own right than some of those examined in other studies, given concerns about the "overworked American" (Schor 1991).

Another problem arising in tests of income pooling is observing threat points. Most researchers have focused on the distribution of household income as a proxy for threat points. Absent the availability of interesting natural experiments, though, it is difficult in most data sets to attribute household income other than labor earnings to particular spouses.[3] Some studies focus on earnings, but this requires assumptions about separability between labor supply and the outcome being studied.[4] An advantage of the ATUS in this regard is that it provides a measure of the hourly wage through its link to the Current Population Survey (CPS). Therefore, we can use the

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[1] Phipps and Burton (1998), Browning et al (1994), and Lundberg, Pollak and Wales (1997) studied clothing spending. Phipps and Burton and Hoddinot and Haddad (1995) studied alcohol and tobacco spending. Lundberg, Starz, and Stillman (2003) and Duflo and Udry (2004) studied food spending. Schultz (1990), Thomas (1990), (1994), Haddad and Hoddinott (1994), Rose (1999), Duflo (2003) and Duflo and Udry studied child outcomes like health and education.

[2] Thus, the income-pooling approach involves a joint test of household bargaining and heterogeneity in preferences. The assignability criterion seems the most reasonable in the case of spending on men's versus women's clothing (though even the latter may have an element of public goods!).

[3] Natural experiments provide clean evidence but are limited to particular settings, like the shift in child welfare transfers from fathers to mothers in the U.K. (Lundberg, Pollak, and Wales 1997), the major increase in old age pensions received by blacks in South Africa (Duflo 2003), and the impact of rainfall on crops farmed by men versus women in Côte d'Ivoire (Duflo and Udry 2003).

[4] Browning et al (1994) and Browning and Chiappori (1999) assume separability between earnings and spending on men's versus women's clothing. Lundberg, Starz, and Stillman (2003) assume separability between labor force participation and spending on food.

hourly wage instead of total earnings as an explanatory variable to proxy for threat points. This eliminates the problem that hours (on the right-hand side) is jointly determined with leisure (on the left-hand side).

However, an important problem still remains that is heightened when studying time use. The hourly wage affects leisure and housework choices through conventional income and substitution effects. This makes it challenging to isolate the impact of the wage specifically on bargaining power and hence time use. We control for total household income in order to deal with income effects, though we still face a problem because we would rather control for non-labor income if we could. Second, we focus on time use during the weekend and on holidays, so we assume that substitution effects are much smaller on weekends when most individuals are not working.

Thus, we estimate the extent to which higher-wage spouses consume more leisure and do less housework on typical days off, compared to lower-wage spouses. Note that the ATUS surveyed one member of each household, so we do not observe time use of people who are married to each other. In our current results, we focus on spouses in two-earner couples. One difficulty of dealing with one-earner households would be the conventional missing wage problem. We can offer no useful exclusion restrictions, since everything that might be used to impute wages already appears in our time use regressions. An additional, more serious, concern is that the bargaining game is much different in households where one spouse has chosen, as a result of an earlier stage of bargaining, not to work.

For our sample of respondents in two-earner households, we find evidence that the higher the share of the household wage earned by wives, the more time they spend enjoying certain types of leisure and the less time doing housework. As wives' wages in two-earner households rise, wives enjoy significantly more leisure – especially socializing with family and friends and watching TV – and spend significantly less time doing chores – especially cooking and cleaning. A one standard deviation increase in a wife's wage raises her total leisure time per weekend day by 31.7 minutes and reduces her total time spent doing chores by 16.6 minutes.

Notably, wives also spend significantly *more* time taking care of children as their wages rise. This is not observed on weekdays, so it might reflect not a difference in productivity at such tasks, but rather in preferences for them. In contrast, significant wage effects are absent for most weekend activities of husbands, so bargaining appears to have little effect on their time use.

Lastly, focusing on the weekends introduces concerns about separability between time use during the week and on the weekend – for example, a higher wage spouse who works a lot during the week may be very tired on the weekend, so that spouse's marginal utility from leisure is high. We address by estimating some specifications that limit the sample to full-time workers or control for usual weekly hours, and all of our main results carry through.

The rest of this paper is organized as follows. Section II discusses theoretical considerations. Section III describes the data. Section IV presents the estimation results.

II. THEORY

We will present a model of time use that highlights income and substitution effects of market wages. Then, we will discuss implications of household bargaining on time use.

A. A model of individual choice involving time use

Suppose that an individual has the utility function

$$U(C, L, S)$$

where each of the arguments are goods (not bads). C is consumption of the market-produced good, L is leisure, and S is consumption of household services (chores), measured in terms of units of time. The individual also faces the following money, time, and adding-up constraints:

$$\text{money budget: } Y + wH = pC + p^M S^M$$
$$\text{time budget: } \bar{T} = H + S^T + L$$
$$\text{adding up: } S = S^M + S^T + S^F .$$

Y is the individual's non-labor income, w is her hourly wage, p is the price of the market-produced good, and p^M is the price of purchasing household services in the market. Household services may be obtained by paying someone else for their time (purchasing S^M) or by devoting one's own time (S^T), or they may be produced exogenously by other family members like a spouse (S^F).[5] We could extend this model by allowing the price of household services p^M to vary by type or quantity of household goods purchased in order to avoid corner solutions in which the individual purchases all or no household services. Lastly, we assume that the individual faces non-negativity constraints on each good and on hours of work, so C, S^j, L, H ≥ 0.

We can make substitutions and assume that C is the numeraire good, so p = 1. Then, omitting the non-negativity constraints, this yields the following problem,

choose L, S^M, and S^T, to maximize
$$U(Y+w(\bar{T} - S^T-L)-w^M S^M, S^M+S^T+S^F, L)$$

with these first-order conditions:

$$\partial U / \partial L = -wU_1 + U_3 \geq 0$$
$$\partial U / \partial S_k^M = -w_k^M U_1 + U_2 \geq 0$$
$$\partial U / \partial S_k^T = -wU_1 + U_2 \geq 0$$

The first condition shows that the individual will choose to spend time enjoying leisure L such that the marginal utility from leisure equals the relative wage times the marginal utility of more market-produced goods. The second condition shows that the individual will choose to purchase those household services in the market such that the marginal utility from household services S equals the relative price of purchasing them in the market times the marginal utility of market-

[5] This assumption is most relevant if household services *S* are public in nature, but for now we will omit free-riding considerations.

produced goods C. The third condition shows that the individual will choose to spend time working to produce household services such that the marginal utility from household services S equals the relative wage times the marginal utility of market-produced goods C.

The solution to the first-order conditions will yield derived demand functions for S^M, S^T, and L that depend on endowments (Y, $\overline{T}$, S^F) and prices (w, w^M). These will yield the following comparative statics, assuming that all goods are normal and that the utility function is separable:

- An increase in the individual's wage w will have the following effects:
  $\uparrow w \Rightarrow$ compensated substitution effect $\Rightarrow \uparrow H \Rightarrow \downarrow S^T, \downarrow L$
  $\uparrow w \Rightarrow$ income effect $\Rightarrow \uparrow L, \uparrow C, \uparrow S^M \Rightarrow \downarrow S^T$

  Through the compensated substitution effect, the individual will work more and spend less time on leisure L and housework S^T. Through the income effect, the individual will consume more of all three goods by purchasing more market goods C and more household services S^M and taking more leisure L. Moreover, as both leisure L and purchases of household services S^M rise, time spent in chores S^T will fall.
- An increase in the spouse's wage will induce the same effects on the spouse's time, which has the following effects on the individual:
  $\uparrow$ spouse's wage $\Rightarrow$ compensated substitution effect for spouse $\Rightarrow \downarrow S^F \Rightarrow \uparrow S^T, \downarrow L$
  $\uparrow$ spouse's wage $\Rightarrow$ income effect for spouse $\Rightarrow \uparrow S^M \Rightarrow \downarrow S^T$

  The spouse will spend less time on chores through the compensated substitution effect, leading the individual to spend more time on chores. The spouse will spend less time on chores and spend more in purchasing household services through the income effect, probably reducing the individual's time spent on chores. If the individual has access to some of the income that the spouse gains, then the she will enjoy more leisure and spend less time on chores, through the income effect outlined earlier.

Thus, the income effect of an increase in the own or the spouse's wage is generally to increase leisure and decrease time spent on chores. The substitution effect of an increase in the own wage is to decrease both leisure and time spent on chores. The substitution effect of an increase in the spouse's wage is to decrease leisure and increase time spent on chores.

B. Household bargaining and time use

The conventional model of cooperative bargaining developed by McElroy and Horney (1981) and Manser and Brown (1981) assumes that spouses work together to maximize household surplus and then engage in Nash bargaining over the surplus.[6] The relative strength of spouses' threat points – their utility outside of marriage – determines the split. A reasonable assumption which is key to tests of income-pooling is that the more income that a spouse controls, the greater their threat point and hence their bargaining power. The resulting prediction that we are

[6] This assumes away the incentive to free-ride on the spouse's contributions to marital public goods. Pollak and Lundberg (1993) proposed a model where threat points involve the utility from non-cooperation within marriage. They suggested that this may lead to each spouse specializing in one of two types of public goods (e.g., taking care of the kids versus fixing things around the house). As they pointed out, most tests of income pooling, like ours, involve income controlled by spouses whether they are married or divorced and so are unable to distinguish between their model and the standard cooperative one.

interested in is that the higher one's wage, the more of the marital surplus that spouse will enjoy, which translates into spending more time in leisure and less time doing chores.

As we noted in the Introduction, it may be difficult to separately identify the bargaining effect which we are interested in from the conventional income and substitution effects on time use which we discussed earlier. We will control for total household income in order to deal with income effects, though we still face a problem because it would be preferable to control for non-labor income if we could. Since household income reflects wages and resulting hours decisions of both spouses, it may absorb some of the bargaining effects that we are interested in. Results from some of the specifications that we discuss later suggest that this is not a major problem. Second, we will focus on time use during the weekend and on holidays, so we assume that substitution effects are much smaller on weekends when most individuals are not working.

A final consideration is that spouses may choose their labor supply with an eye towards the effect on their threat points. This has several implications which complicate efforts to consider one-earner households in our analysis. First, the bargaining game may be very different in households where one spouse has chosen, as a result of an earlier stage of bargaining, not to work. This suggests that we should not combine one and two-earner households in the same regressions. Second, if it is difficult for a nonworking spouse to exercise the threat of working, then it is not clear what the relevant threat point is for nonworkers. Is their wage effectively zero for purposes of bargaining over time use, or is it their potential market wage if they returned to work, or is it the market wage discounted in some way for costs of re-entry? Third, if the relevant threat point is some function of the potential market wage, we can offer no useful exclusion restrictions to impute the missing wage, since everything that might be used to impute wages already appears in our time use regressions. Fourth, if the relevant threat point is around zero, or otherwise varies little across the sample, then we might face identification problems in distinguishing the bargaining effect of own wages relative to spouses' wages and relative to household income, which will be highly collinear with spouses' wages. Consequently, our current results focus on respondents in two-earner couples.

III. DATA

We will estimate reduced form models of the determinants of leisure L and time spent producing household services S^T. We estimate all specifications separately for husbands and wives, since their time use patterns appear very different. We use data from the first year of the American Time Use Survey, released in January 2005. This data covers 20,720 respondents interviewed in 2003.[7] The sample was drawn from members of civilian non-institutionalized households 2-5

[7] A random sample of households leaving each month's CPS were chosen to participate in the ATUS, and an adult was randomly sampled from this group of households and pre-assigned a day of the week about which to report. They were contacted for eight consecutive weeks in order to secure the interview. Out of this group, the response rate yielding the sample discussed above was 57%. According to the ATUS documentation, "the primary reason for nonresponse is that the designated persons are tired from participating in the CPS survey" (p.10, *American Time Use Survey User's Guide*, November 2004). Obviously of concern is that the more a spouse in a particular household work, the less likely she is to take the time to respond to the ATUS. We present evidence below that indicates this is not the case.

months after they had left the final month of the Current Population Survey, and detailed CPS data on work, wages, and demographics is linked to the ATUS.

A. The sample

Much of the ATUS sample is not suitable for our analysis. We eliminated individuals who were not married, who had other adults besides their spouse or any disabled adults in the household, and who did not have wage data for themselves or their spouses from the CPS. Specifically, we make the following exclusions:

1. We eliminated households of individuals or cohabiting couples (leaving a sample of 9,550). Cohabiting couples might make decisions differently than married couples, and cohabitation was not carefully treated in the CPS.
2. We eliminated households with anyone other than the married couple who was over the age of 16 (leaving a sample of 9,176), since other adults might contribute time and/or money to the household and thus alter the time use of the respondents.
3. We eliminated households in which some member recorded in the ATUS was not recorded in the CPS, since we need CPS data for other household members (leaving a sample of 8,850).
4. We eliminated households not already eliminated in #3 in which the ATUS respondent was reported as unmarried in the CPS, since we need wage data on both spouses from the CPS (leaving a sample of 8,744).
5. We eliminated households not already eliminated in #2 in which the household was reported as containing a subfamily in addition to the main family (leaving a sample of 8,736).
6. We eliminated households in which either spouse was reported as disabled in either the CPS or ATUS, since time use decisions in such households may be very different (leaving a sample of 8,287).[8]
7. We eliminated households in which the ATUS respondent could not account for more than 30 minutes of their daily activities (leaving a sample of 7,669).[9]

In addition, we undertook additional restrictions to arrive at the sample we analyze:

8. Of the 7,669 remaining households, we focus on the 3,965 respondents in two-worker households.[10]
9. Of those, we could compute the log hourly wage for both spouses using CPS data for 2,677 respondents.
10. Of those, 1,368 were interviewed about time use on weekends or holidays, consisting of 654 male respondents and 714 female respondents.

B. Measuring time use

[8] We use information from both the ATUS and the CPS on disability (defined by whether it makes someone unable to work). Disability reported at the time of the ATUS was more current but not defined as carefully as in the CPS, particularly for the spouse.

[9] This is defined as any activity for which the Tier 1 code is 50.

[10] This is defined by whether the respondent was employed and at work (TELFS=1) and whether the spouse was employed (TESPEMPNOT==1). Information on whether the spouse was at work is not reported.

Each person contacted by the ATUS was pre-assigned a day of the week, with oversamples of weekend days. The interview was conducted by telephone on the day following the pre-assigned day of the week. ATUS interviewers recorded every activity done during the assigned day, categorized by type of activity, start time, stop time, location, and presence of others.

We classified every household activity in one of four categories: leisure (L), chores (or production of household services S), work (H), and emergencies (E).[11] For the most part, we followed the ATUS in grouping activities while excluding emergencies, since they probably add noise and tell us little about regular time use patterns. We made slight changes to the ATUS definitions of some activities following careful consideration, but the estimation results presented below were not sensitive to these distinctions. Our classification of activities is summarized below and detailed in the Appendix.

Leisure:
- Personal care, sleep
- Eating, drinking (incl. as part of job)
- Socializing, relaxing, leisure (same)
- Sports, exercise, recreation (same)
- Religious, spiritual activities
- Volunteer activities
- Phone calls, mail, e-mail with family, friends
- Education, if "for personal interest"
- Personal care services
- Travel associated with these activities

Chores:
- Household activities
- Caring for, helping household, non-household members
- Consumer purchases
- Professional services
- Household services
- Government services
- Travel associated with these activities

Work:
- Working, work-related activities
- Education, if "for degree"
- Travel associated with these activities

Emergencies and other exclusions:
- Personal care emergencies
- Obtaining police, fire services
- Civic obligations
- Activities that cannot be coded
- Travel associated with these activities

C. Measuring other covariates

The ATUS includes a great deal of data from the outgoing rotation group of the CPS, which took place 2-5 months earlier. We use wage data, computed as either hourly earnings if reported, or

[11] We focused strictly on the 24-hour period of the designated day, so we ignored information on the length of time of an activity that continued into the following 24-hour period.

weekly earnings divided by usual weekly hours of work. The CPS also reports household income grouped in fairly narrow ranges; we include a dummy value for each range value. However, as we noted earlier, it may be a problem that we do not have data on non-labor income. To see how much of a problem this is, we try some specifications that control for usual weekly hours as well as weekly wages.

Time use will also depend on the number and age of children in the household. More children, especially young ones, means more time or money is required for childcare, while older children may help with household chores. Therefore, it is important to control for the presence and age of children; we also try estimating regressions separately for individuals with different numbers of children. Lastly, we will control for common demographic variables, including education, race, and age.[12]

IV. RESULTS

To sum up, we run regressions analyzing the time use on weekends and holidays of individuals who are married. Our hypothesis is that the higher a spouses wage is, the more time they enjoy in leisure and the less time they spend doing chores. As noted above, we run separate regressions for men and women, and we focus on two-earner households.

A. Raw statistics

Table 1 shows characteristics for the samples of working men and women who have working spouses and who were surveyed on weekends or holidays. Men have higher average wages than women. The average log hourly wage of male and female respondents is 2.95 and 2.67, respectively. The average log hourly wage of their spouses is almost identical, at 2.71 for wives of male respondents and 2.93 for husbands of female respondents, while the modal level of household income in both samples was $75,000-99,999. The average age of respondents is just over 40, again with almost symmetric results for husbands and wives. This symmetry across the male and female sample suggests very similar response patterns by gender.[13]

Table 2 shows general time use patterns of the weekend respondents, compared to weekday respondents. Men spend more time working and less time doing chores on both weekdays and weekends, compared to women, while they have less leisure time on weekdays and more leisure time on weekends than women do. Men work an average of 536 minutes on weekdays and 105 minutes on weekend days, while women work 413 minutes on weekdays and 80 minutes on weekend days. Men take 764 minutes of leisure on weekdays and 1061 minutes on weekend days, compared to women who take 793 minutes on weekdays and 1023 on weekend days. Lastly, men spend 139 minutes on chores on weekdays and 231 minutes on weekends days, while women spend 231 minutes on weekdays and 336 minutes on weekend days.[14]

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[12] We control for own and spouse's education and age and own race. We found that spouse's race did not have statistically distinguishable effects from own race.

[13] While the ATUS chose a random member of CPS households to approach, differential response rates could be correlated with intensity of time use or likelihood of being at home and hence by gender. The statistics highlighted in Table 1 reduce such concerns.

[14] All of these gender differences in aggregate weekday and weekend time use are statistically significant.

Our focus is on time spent enjoying leisure and doing chores on weekends. Leisure time on weekend days consists of, roughly, over 500 minutes of sleeping, 86 minutes of eating, around 20 minutes (for women) and 40 minutes (for men) of doing sports and exercise, and around 30 minutes in religious and volunteering activities. Besides that, men spend around 330 minutes and women around 280 minutes in general relaxation and leisure. This breaks down into 120 minutes (for women) and 180 minutes (for men) of watching television, a little under 60 minutes socializing with family and friends, 20 minutes reading and writing, and around 15 minutes each of attending social events and arts and entertainment events.

Chores can be grouped into three major types – doing work around the house, taking care of people, and shopping. As an easy shorthand, and also based on observed time use differences, we grouped chores that involved work around the house as either "women's" or "men's" chores. Women spend 144 minutes on "women's" chores on weekend days, including 79 minutes on cleaning and 52 minutes on food preparation, while men spend 57 minutes on "women's" chores. Conversely, women spend only 27 minutes on "men's" chores, compared to 86 minutes for men, including 19 minutes fixing things inside, 20 minutes working on the house outside, 35 minutes working on the lawn and garden, and 12 minutes fixing vehicles and appliances. Women spend more time on caring for household members (63 minutes) and non-household members (17 minutes) than men do (45 and 12). Lastly, women spend more time shopping (79 minutes) than men do (66 minutes).

B. Estimation results, aggregate time use

Tables 3-A and 3-B show results from OLS regressions on, respectively, total time spent in leisure and total time spent doing chores per weekend day and holiday. Estimates that are statistically significant at 90% or greater are outlined in dashed boxes. The samples, once again, are working men and women who have working spouses. Independent variables are wage and household income data, characteristics of children, own and spouse's education and age, own race and ethnicity, and season dummies. The specifications we prefer include the own wage in logs, the spouse's wage in logs, and household income dummies.[15] The other set of specifications includes the sum of one's own and one's spouse's wage, along with the share of the total wage earned by oneself.

A higher wage raises women's leisure time in Table 3-A, with statistical significance at greater than 99%. The coefficient of 56.2 (15.8) implies that an increase of 10% in a woman's hourly wage raises her leisure time per weekend day by 5.62 minutes, and a one standard deviation increase of 0.565 in her wage raises her leisure time by 31.7 minutes.

The estimated effects of the included covariates on time spent doing chores in Table 3-B tend to be opposite in sign and similar in magnitude.[16] A higher wage lowers women's time spent doing chores, with a coefficient of -29.5 (16.6) that is statistically significant at over 90%. Each increase of 10% reduces her time spent doing chores on a weekend day by 2.95 minutes, and a

[15] The results are very similar whether we control for levels or logs of wages.

[16] Recall that the additional categories of time use are working and emergencies. The estimated effects of wages on these variables are reported in Table 4.

one standard deviation increase in her wage reduces it by 16.6 minutes. The estimated effect of the husband's wage on wife's time doing chores is 23.8 (17.8), which falls a little short of statistical significance (the p-value is 0.18) but is similar in magnitude and opposite in sign to the estimated effect of her own wage.

In contrast, the estimated effect of the husband's wage on his time spent taking leisure is relatively small and not statistically significant, while the effect on time spent doing chores is statistically significant, large, and *positive* – which is the wrong sign. Table 4 disaggregates the results for many specific types of leisure and household services, which reveals important insights about the estimated effects of wages on both men's and women's time use.

Besides the wage effects, men in households with children under the age of 6 enjoy 57 fewer minutes of leisure on each weekend day, while women enjoy 78 fewer minutes of leisure. The loss of leisure time in households with children aged 6 and over is significant but smaller by 15-25 minutes.[17] Leisure time of both men and women decreases with the man's age and increases with the women's age. While household income and a few education dummies are statistically significant, none of the estimated coefficients are monotonic.[18]

C. Estimation results, specific activities

Table 4 reports the estimated effect of wages on many subcategories of leisure and chores.[19] We report the estimated effect of the own wage and, where the standard error is smaller than the coefficient estimate, the estimated effect of the spouse's wage.[20] Here, it becomes clear that there are specific types of time use that as expected respond to wages, and others that respond in surprising ways.

We will judge these results by the magnitude of the estimated coefficients, although they lose some precision as we focus on narrower categories. The most interesting effects of wages on women's leisure time arises in the "Miscellaneous leisure" category, while other categories like sleeping, eating, exercise, and religious activities are unresponsive.[21] Compared to the estimated effect of 56.2 (15.8) of a wife's wage on her total leisure time, the estimated effect on "Miscellaneous leisure" is 50.4 (14.5). Breaking down the category further reveals an effect of 10.3 (7.3) on "Socializing and communicating with others", which includes family and friends

[17] While the R^2 of the regression is a little lower if we control for number rather than presence of kids, doing so suggest that each child under the age of 6 reduces mothers' and fathers' leisure time by 54.7 and 35.2 minutes, respectively, while each child aged 6 and over reduces it by 25.0 minutes and 21.4 minutes.

[18] The other specification for women in column (4) reveals a positive but extremely small income effect from the sum of both spouses' wages on wives' leisure time. However, this specification is more restrictive in estimating the wage effects and uses less information on household resources, as is apparent from the lower R^2. We initially tried this specification out of concern for whether we could separately identify effects of spouses' wages while also controlling for household income.

[19] As we analyze more narrowly defined categories of time use, we will consider reporting estimates from tobits instead of linear regressions. The estimated wage effects that are of interest remain significant in tobits.

[20] Also in the interest of manageability, we did not report estimates for a comprehensive breakdown of time use categories in Table 4. We omitted minonr subcategories of time use, all o f which are shown in Table 2. Appendix Table 2 shows how we allocated ATUS time use activities into various subcategories of leisure and chores.

[21] The "Miscellaneous leisure" category amalgamates time spent communicating with friends and family via phone, e-mail, and mail together with the broad "Socializing, relaxing, and leisure" category of the ATUS.

but does not include going out to social events, and 25.7 (11.6) on "Relaxing and leisure". The estimated effect of the husband's wage on the wife's time spent on "Relaxing and leisure" is similar in magnitude and opposite in sign, at -19.4 (12.2). Again delving further within this lst category, the most important effects are on watching TV, with statistically significant coefficients on the wife's wage of 17.9 (9.9) and on the husband's wage of -19.4 (12.2). To sum up, as the wife's wage increases relative to her husband's, she spends more time socializing with family and friends and especially more time watching TV.

The results are quite different for men. Here, estimated effects of wages are either statistically insignificant or have an unexpected sign. For example, as the husband's wage increases, he tends to spend less time watching TV, with an estimated coefficient of -22.3 (15.0). We conclude that bargaining generally has much less of an effect on a husband's leisure time than on a wife's.

Now, we move on to consider bargaining effects on types of chores that people spend time on. The estimated effect of women's and men's wage on the total time spent by women on chores was -29.5 (16.6) and 23.8 (17.8). The time that women spend on household tasks that we denoted as "women's" chores are most responsive; the estimated effect of her wage is -31.9 (11.5), and the estimated effect of his wage is 14.3 (11.6). Among "women's" chores, the most sensitive is cleaning, at -18.8 (8.2), with food preparation at -8.4 (7.0) and laundry and other tasks at -4.8 (4.4). Finally, women's wages have negative but statistically insignificant effects on "men's" household chores and on shopping.

Another notable feature of Table 4 is counterintuitive signs on the estimated effects of wages on some major activities defined as household services. The time that women spend taking care of children *rises* with their wages, as does the time that men spend on some "men's" chores. The estimated effect of women's wages on the time women spend caring for household children is 13.2 (6.5), and it is limited to general activities – playing, reading, getting ready for bed – and not those related to education, health, or driving. While men's wages also increase the time women spend on such activities, with a coefficient of 10.1 (7.9), men's and women's wages have virtually no effect on the amount of time men spend taking care of children.

Lastly, the amount of time that men spend on "men's" household chores increases substantially with their wages, with an estimated coefficient of 41.6 (12.8). The biggest effects within this category are coefficients of 17.8 (7.0) for "fixing things inside", which includes interior maintenance and decoration and home security, and 22.0 (7.6) for "lawn and garden" care. Other "men's" chores, including "fixing things outside" (exterior maintenance and decoration, pool and hot tub care) and "cars, tools, and appliances" repair and maintenance are not responsive to wages.[22]

[22] It might be desirable to control for home ownership, although some effect of home ownership should already be absorbed by household income. On the other hand, the decision to own a home may reflect a willingness to invest in marriage-specific capital that is correlated with bargaining (Stevenson 2005). In any case, controlling for home ownership would require returning to the original CPS files. The CPS files available through www.nber.org report a value of -1 for the home ownership variable in all files for 2002 and 2003; we will obtain this information directly from the U.S. Bureau of Labor Statistics Data Ferret.

These findings argue for reconsidering the definition of leisure and chores, since we may infer from these results that women enjoy child care and men enjoy fixing things and taking care of the lawn.[23] At the end of Table 4, we report the estimated effects of wages when we redefine leisure and chores accordingly.[24] As a result, the estimated effect of women's wages on women's redefined leisure time is 67.4 (14.9), and the estimated effect on women's time spent doing chores is -40.6 (13.9). A one standard deviation in women's wages raises time spent on redefined leisure by 38.4 minutes and reduces time spent on chores by 23.3 minutes. Redefining these activities moves things in the hypothesized direction for men, but the effects remain less noteworthy. The estimated effects of men's wages on men's redefined leisure time and time spent doing chores is 28.0 (22.4) and -1.5 (15.8).

Table 4 reports additional results. First, for both women and men, a higher wage leads to fewer minutes spent working on the weekends. This runs contrary to the concern that compensated substitution effects are observed on weekends as well as weekdays. It may well reflect the nature of work schedules for higher versus lower wage workers. When we include detailed industry, occupation, and class of job dummies in the estimation in results that are not reported, the negative effect of own wages on men's time spent working goes away, but it persists for women.[25] Second, the effect of wages on emergencies is extremely small, so it is reasonable to keep them as separate categories.

Third, Table 4 also reports results for the same regressions on weekdays. The estimates show clear indications of the substitution effects that we discussed earlier. A higher wage raises weekday work hours and reduces time spent on leisure and chores. These effects are mostly significant for women, with a coefficient of 54.6 (22.5) on time spent working, -20.5 (16.6) on leisure time, and -32.6 (14.9) on time spent doing chores. Notably, in results that are not shown, the unexpected positive signs of own wages on certain weekend chores (involving men's time spent on "men's" chores and women's time spent taking care of children) do *not* appear on weekdays. These results suggest that it is not differences in productivity at doing these chores that generates the results, but rather differences in preferences over weekend time use.

D. Additional specifications

One might be concerned that people who work harder during the week are simply more tired on the weekend and consequently do fewer chores – so that time spent working during the week and time use on the weekends is not separable. We tried two different approaches to deal with this concern.

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[23] Another explanation is that there may be gender differences in productivity in accomplishing these household tasks that is correlated with market wages. It is worth noting, however, that the anomalous effects of wages on these activities is not observed on weekdays.

[24] While these effects differ markedly for men and women, we reclassified the activities in question (caring for household children and "men's" chores) for both. We get very similar results if we only reclassify caring for household children when focusing on women and "men's" chores when focusing on men.

[25] The estimated effect of men's wages on men's leisure time becomes more negative, while the estimated wage effects on women's time use changes little. Including these job characteristics increases the explanatory power of the regressions substantially, so they capture some important time use patterns. Respondents' job characteristics are reported in the ATUS, while spouses' job characteristics are reported in the earlier CPS.

First, we re-estimated many of the specifications in Table 4 but limited the sample to households in which both spouses work full-time (defined as usual weekly hours of thirty or more).[26] These results are reported in Table 5. The effects we are interested in persist and in some cases are stronger. The effect of own wages is 58.5 (20.3) on women's weekend leisure time and 76.5 (19.1) on redefined leisure time (including care of household children). The effect of own wages on men's leisure time is similarly larger in this specification. While the effect on women's time doing chores is small at -11.6 (22.1), the effect is somewhat greater on redefined time doing chores, at -29.6 (19.0). As above, the strongest effects for particular activities are the expected positive effect on women's "Miscellaneous leisure" time, the expected negative effect on "women's" chores, and the surprising positive effects on women's time spent caring for children and men's time spent on "men's" chores.

Another way that we addressed concerns about separability between weekday and weekend time use was to include controls for usual weekly hours of both spouses in the weekend time use regressions. The results for aggregate time use categories, as shown in Table 6, are little changed. Meanwhile, the higher one's weekly hours, the higher one's weekend work time and the correspondingly lower one's weekend time for leisure and chores. These results do not confirm the concern that higher-wage people who work harder during the week take more leisure on the weekends.

The results in Table 6 also allay concerns that we generally control for household income, which includes work hours, rather than non-labor income. If work hours are a choice that is governed in part by bargaining considerations, then the household income variable might absorb some of the bargaining effects that we are interested in. This does not generally appear to be the case.

We might expect very different time use patterns for household with and without children. Our last set of results in Table 7 divides the sample into households with young children under the age of 6, households without young children but with older children, and households without children. The greatest positive effect of women's wages on redefined leisure time is in childless households, at 96.3 (26.5), but the effects are large for women with young and older children and significant for women with young children. The negative effect of women's wages on redefined time doing chores is significant and similar in magnitude for women who are childless and women with older children, but it is close to zero for women with small children. The effect of men's wages on men's leisure time is not statistically significant for any group, but it is relatively large for all but men with small children, while the negative effect on chores is statistically significant for the latter group only.

V. CONCLUSIONS

A growing literature offers evidence that the distribution of bargaining power within a household influences household spending decisions. We extend this literature by analyzing time allocated by spouses to leisure and chores.

[26] The ATUS does not report hours of work for the current week.

Studying time use offers important advantages over other tests of income pooling. One problem in tests of income pooling is finding outcomes that are both interesting and assignable. Time use is easy to observe and to assign using data from the new American Time Use Survey. Another problem commonly arising in tests of income pooling is observing threat points. An advantage of the ATUS is that it provides a measure of the hourly wage through its link to the Current Population Survey. Using the hourly wage instead of total earnings as a proxy for threat points eliminates the problem that hours (on the right-hand side) is jointly determined with leisure (on the left-hand side). A final concern in studying time use is that higher wages will influence time use through conventional income and substitution effects, making it difficult to identify a separate bargaining effect of wages. Hence, we control for household income and focus on time use on weekends, when substitution effects from wages should be much smaller.

We find evidence that, as wives' wages in two-earner households rise, wives enjoy significantly more leisure – especially socializing with family and friends and watching TV – and spend significantly less time doing chores – especially cooking and cleaning. A one standard deviation increase in a wife's wage raises her total leisure time per weekend day by 31.7 minutes and reduces her total time spent doing chores by 16.6 minutes. Notably, wives also spend significantly *more* time taking care of children as their wages rise. This is not observed on weekdays, so it might reflect not a difference in productivity at such tasks, but rather in preferences for them. In contrast, significant wage effects are absent for most weekend activities of husbands, so bargaining appears to have little effect on their time use. We hope to extend this analysis to consider the impact of household bargaining on time use in one-earner households.

APPENDIX

Appendix Table 1 shows how we classified time use activities into the following categories: Leisure (L), Household Services (S), Work (H), and Emergencies/Other Exclusions (E). The table lists ATUS activities in the order in which they are classified. By way of comparison, the table also reports official ATUS classifications. Note that our grouping of four categories is broader than the ATUS grouping of twelve categories.

APPENDIX TABLE 1
Classification of ATUS activities

ATUS code	Description	Our classification	ATUS classification
01 except …	personal care	L	personal care
0105	personal care emergencies	E	
02 except …	household activities	S	household activities
020903 020904	household & personal mail, messages, & e-mail	L	telephone calls, mail, & e-mail
03	caring for & helping household members	S	caring for & helping household members
04	caring for & helping non-household members	S	caring for & helping non-household members
05 except …	working & work-related activities	H	

050201-050203	socializing, eating, sports as part of job	L	working & work-related activities
06 except ...	educational activities	H or L	educational activities
060101 060301 060401	education "for degree"	H	
060102 060302 060402	education "for personal interest"	L	
07	consumer purchases	S	purchasing goods & services
08 except ...	professional & personal care svcs	S	
0805	personal care services	L	
09	household services	S	
10 except ...	government services & civic obligations	S	
100101 100301	using & waiting to use police & fire services	E	
1002 100303	doing & waiting to do civic obligations & participation	E	organizational, civic, & religious activities
11	eating & drinking	L	eating & drinking
12	socializing, relaxing, & leisure	L	leisure & sports
13	sports, exercise, & recreation	L	
14	religious & spiritual activities	L	organizational, civic, & religious activities
15	volunteer activities	L	
16 except ...	telephone calls	S	telephone calls, mail, & e-mail
160101 160102	telephone calls w/ family, friends	L	
17	traveling	assigned to associated activities above	
50	data codes	E	other activities, n.e.c.

Here are some additional comments:

- We follow the ATUS in grouping travel with the activity to or from which the person is traveling.[27]
- We follow the ATUS in distinguishing household and personal mail, messages, and e-mail from other household activities. While the ATUS groups them in a category with telephone calls, we group all such communications with friends and family as Leisure and other communications as Household services.
- We follow the ATUS in grouping "consumer purchases", "professional and personal care services", "household services", and most subcategories of "using government services" together. We group them further as part of Household services. The ATUS distinguishes "civic obligations and participation" from other categories of "using government services" and groups them with religious and volunteer activities; we group them with Emergencies/other exclusions. We classify "police and fire services" as part of Emergencies as well.
- We chose to group educational activities, which the ATUS keeps as a distinct category, as part of either leisure or work, depending on whether the activities are identified as being "for personal interest" or "for degree". When one or the other of several codes that make this distinction appeared, other educational activities were attributed to the same category.

[27] We assigned travel that was not associated with a particular activity to adjacent activities that could be classified.

In Tables 2, 4, and 5, we broke down leisure and chores into finer categories, according to the following classification:

APPENDIX TABLE 2
Subclassification of ATUS activities classified as Leisure and Household services

ATUS code	Description
Leisure activities	
0101	Personal care – sleep
01, except 0101 0105 0805	Personal care – other (grooming, sex)
11	Eating and drinking
020903 020904 160101 160102	Miscellaneous leisure – mail, e-mail, phone w/ family, friends
1201	Miscellaneous leisure – socializing, spending time w/ family, friends
1202	Miscellaneous leisure – attending social events
120301 120302	Miscellaneous leisure – relaxing and leisure – relaxing, thinking, smoking, drug use
120303 120304	Miscellaneous leisure – relaxing and leisure – watching TV
120307 120308	Miscellaneous leisure – relaxing and leisure – games, computer use
120312 120313	Miscellaneous leisure – relaxing and leisure – reading, writing
other 1203	Miscellaneous leisure – relaxing and leisure – other (music, hobbies)
1204	Miscellaneous leisure – going out for arts and entertainment
other 12	Miscellaneous leisure – other (waiting associated with
1301 130301 130401	Sports, exercise, & recreation – participating
other 13	Sports, exercise, & recreation – watching, other
14	Religious & spiritual activities
15	Volunteering
Chores	
0201	"Women's" chores – cleaning
0202	"Women's" chores – food preparation
020902 020999 0305	"Women's" chores – laundry, other (household organization, helping household adults)
0203 020905	"Men's" chores – fixing things inside (interior maintenance and decoration, home security)
0204 020502	"Men's" chores – fixing things outside (exterior maintenance and decoration, pool and hot tub)
other 0205	"Men's" chores – lawn & garden
0207 0208	"Men's" chores – cars, tools, appliances (repair and maintenance)
020901	Household finances
0301	Caring for household members – children – general (physical care, reading, playing, talking, attending children's events)
0302 160103	Caring for household members – children – educational
170301	Caring for household members – children – driving
0303 0399	Caring for household members – children – other (children's health)

0206	Caring for household members – pets
0304	Caring for household members – caring for other adults
0401 0402 0403	Caring for non-household members – children
0405	Caring for non-household members – other adults – helping
170402 170499	Caring for non-household members – other adults – driving
0404 0499	Caring for non-household members – other adults – caring, other
07	Shopping – goods
0801 09 160106	Shopping – household services (childcare, cleaning, lawn services, pet
160107	care, home maintenance,
other 08	Shopping – other (professional services, government services, phone
10 as noted above	calls with sales people and other service providers)
other 16	

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TABLE 1
Sample statistics

Mean	Husbands	Wives
ln(hourly wage)	2.95 (0.52)	2.67 (0.56)
ln(spouse's hourly wage)	2.71 (0.55)	2.93 (0.54)
household income [modal answer]	$75,000-99,999	$75,000-99,999
hourly wage / (own + spouse's hourly wage)	0.554 (0.138)	0.443 (0.136)
own + spouse's hourly wage	39.3 (18.2)	38.7 (19.4)
any kids age < 6	0.300	0.303
any kids age ≥ 6	0.451	0.450
self: high school diploma	0.229	0.261
some college	0.300	0.325
BA	0.278	0.251
post-graduate	0.139	0.136
spouse: high school diploma	0.235	0.268
some college	0.306	0.286
BA	0.275	0.239
post-graduate	0.141	0.144
self: black	0.086	0.041
other nonwhite	0.040	0.035
self: hispanic	0.075	0.090
self: age	42.6 (10.1)	40.4 (9.9)
spouse: age	40.5 (9.7)	42.2 (10.0)
season: winter	0.271	0.268
spring	0.263	0.216
summer	0.219	0.277
sample size N	654	714

Data from the 2003 American Time Use Survey. This table reports statistics on the independent variables included in regressions reported in later tables.
Variable definitions and sample selection are reported in the text. The sample includes married individuals who work, whose spouses work, who have earnings data from the CPS, and who were interviewed on the weekend or on a holiday.
Standard deviations are reported for variables that are not binary.

TABLE 2
Time use on weekdays and weekends

Average minutes spent per day	Men		Women	
	Weekdays	Weekends	Weekdays	Weekends
Total time	1440	1440	1440	1440
Total time working	536 (210)	105 (209)	414 (232)	80 (184)
Main job	482 (193)	86 (190)	371 (213)	64 (164)
Other job	8 (46)	9 (65)	6 (47)	8 (55)
Job search	0.5 (8)	0.4 (6)	0.2 (5)	0
Work-related travel, driving	41 (40)	7 (19)	29 (32)	4 (15)
Other work-related activities	5 (38)	3 (28)	7 (46)	4 (38)
Total time in leisure	764 (176)	1061 (226)	793 (173)	1023 (217)
Personal care	486 (103)	568 (119)	526 (106)	600 (122)
sleep	445 (99)	533 (118)	468 (100)	548 (117)
other	41 (43)	35 (42)	58 (52)	51 (49)
Eating & drinking	70 (45)	86 (68)	71 (65)	86 (71)
Misc. leisure	182 (130)	333 (193)	168 (138)	279 (177)
mail,e-mail,phone w/ family,friends	4 (13)	3 (17)	7 (21)	7 (29)
socializing, time w/ family	21 (51)	51 (100)	29 (59)	57 (98)
attending social events	2 (14)	18 (70)	2 (19)	13 (52)
relaxing & leisure	149 (123)	232 (174)	118 (115)	174 (146)
relax, think, smoking	14 (38)	14 (48)	13 (51)	11 (38)
watching TV	108 (107)	176 (156)	84 (92)	129 (128)
games, computer use	11 (37)	16 (56)	6 (27)	9 (34)
reading, writing	14 (35)	22 (56)	13 (32)	23 (51)
other	2 (16)	4 (28)	2 (19)	2 (19)
going out for arts & ent.	2 (17)	12 (52)	5 (30)	11 (56)
other	5 (15)	16 (33)	7 (21)	16 (36)
Sports, exercise, & recreation	15 (49)	40 (113)	12 (38)	21 (71)
participating	12 (44)	33 (103)	11 (35)	16 (56)
watching	3 (23)	7 (42)	1 (15)	6 (43)
Religious & spiritual	3 (18)	22 (62)	4 (21)	25 (65)
Volunteering	7 (48)	10 (60)	9 (44)	11 (48)
Other	2 (19)	1 (12)	3 (18)	2 (24)
Total time on chores	139 (143)	231 (200)	231 (176)	336 (201)
"Women's" chores	31 (53)	57 (86)	81 (88)	144 (139)
cleaning	9 (32)	25 (64)	37 (64)	79 (112)
food preparation	16 (29)	23 (42)	38 (41)	52 (65)
laundry, other	6 (22)	10 (31)	7 (24)	12 (53)
"Men's" chores	22 (68)	86 (139)	10 (37)	27 (72)
fixing things inside	4 (29)	19 (78)	3 (18)	8 (46)
fixing things outside	6 (29)	20 (77)	1 (12)	5 (28)

lawn & garden	8 (36)	35 (84)	5 (27)	13 (49)
cars, tools, appliances	4 (30)	12 (44)	1 (7)	1 (10)
Household finances	2 (10)	3 (31)	3 (17)	2 (13)
Caring for household members	44 (76)	45 (93)	77 (98)	63 (102)
children	39 (76)	42 (92)	71 (98)	56 (100)
general	29 (65)	36 (83)	51 (75)	48 (89)
educational	3 (17)	2 (14)	6 (21)	2 (12)
driving	6 (16)	3 (15)	12 (24)	4 (17)
other	1 (9)	1 (15)	2 (18)	1 (20)
pets	4 (13)	4 (16)	4 (14)	7 (25)
caring for other adults	1 (10)	0.1 (3)	1 (15)	0.4 (4)
Caring for non-hhold members	9 (39)	12 (46)	12 (54)	17 (61)
children	2 (15)	3 (22)	5 (34)	5 (32)
other adults	7 (36)	9 (41)	8 (44)	12 (52)
helping	4 (24)	5 (31)	2 (17)	5 (36)
driving	3 (18)	2 (13)	3 (17)	4 (19)
caring, other	1 (10)	1 (18)	3 (30)	2 (21)
Shopping	30 (58)	66 (97)	46 (72)	79 (97)
goods	23 (48)	62 (96)	35 (63)	75 (95)
household services	1 (10)	1 (15)	2 (12)	1 (10)
other	5 (26)	3 (17)	9 (30)	3 (17)
Other	2 (24)	4 (23)	2 (17)	3 (22)
Total time in emergencies	2 (24)	2 (15)	2 (9)	2 (10)
Total time in leisure, redefined	825 (180)	1188 (219)	874 (178)	1107 (210)
Total time on chores, redefined	78 (102)	146 (145)	150 (136)	253 (175)
N	631	654	678	714

Data from the 2003 American Time Use Survey. Each column in this table reports the time use, in average minutes each day, of a different sample.
Sample selection criteria are reported in the notes to Table 1 and in the text. The classification of time use is reported in the Appendix. "Leisure, redefined" and "chores, redefined" begin with the definitions of leisure and chores laid out in the Appendix and switch the categories "caring for household children" and "'men's' chores" from chores to leisure.
Standard deviations are reported in parentheses.

TABLE 3-A
Weekend time spent in leisure activities, OLS regression results

	Dependent variable: Minutes of leisure per day on weekends and holidays			
	Men		Women	
Independent variables:	(1)	(2)	(3)	(4)
ln(hourly wage)	-13.8 (21.9)	-	56.2 (15.8)	-
ln(spouse's hourly wage)	0.4 (21.5)	-	-9.7 (18.0)	-
HH income dummies?	yes	no	yes	no
[p-value on joint F test]	[0.0000]		[0.0098]	
hourly wage	-	-30.8 (74.3)	-	165.1 (60.3)
(own + spouse's hourly wage)				
own + spouse's hourly wage	-	-0.059 (0.482)	-	1.022 (0.462)
has kids age < 6	-56.8 (23.3)	-61.2 (22.8)	-78.3 (19.7)	-81.6 (19.8)
has kids age ≥ 6	-41.8 (18.9)	-38.1 (18.4)	-52.7 (16.6)	-55.0 (16.5)
self: high school diploma	-101.6 (48.7)	-74.7 (45.4)	-18.6 (67.0)	-11.7 (66.3)
some college	-98.6 (49.9)	-73.0 (46.3)	-8.9 (65.6)	-5.1 (65.6)
bachelor's degree	-86.8 (52.9)	-57.9 (49.7)	-57.0 (68.0)	-56.8 (68.1)
post-graduate	-69.4 (55.8)	-40.5 (52.9)	-78.5 (71.8)	-78.7 (71.2)
spouse: high school diploma	11.9 (48.6)	36.7 (46.5)	89.2 (48.7)	79.8 (47.8)
some college	-10.1 (48.9)	11.3 (47.5)	24.8 (47.8)	19.5 (47.4)
bachelor's degree	-14.1 (52.5)	7.7 (50.1)	63.7 (50.3)	61.5 (49.6)
post-graduate	-40.4 (57.5)	-18.2 (55.3)	100.6 (56.1)	87.5 (56.1)
self: black	91.5 (31.4)	98.2 (30.4)	62.9 (44.8)	57.7 (42.9)
other nonwhite	9.3 (48.2)	8.1 (47.6)	-48.5 (40.4)	-46.8 (39.7)
self: hispanic	-8.5 (34.7)	-16.7 (34.0)	17.9 (30.4)	21.7 (29.9)
self: age	-2.8 (2.0)	-2.9 (2.0)	2.4 (2.0)	2.1 (2.0)
spouse: age	2.2 (2.0)	2.3 (2.0)	-3.0 (1.9)	-3.0 (1.9)
season: winter	45.7 (25.9)	43.3 (25.4)	8.9 (21.6)	8.8 (21.5)
spring	2.4 (25.0)	1.4 (25.0)	- 15.1 (23.9)	-17.1 (23.8)
summer	29.0 (26.9)	30.8 (26.4)	3.7 (22.3)	1.6 (22.3)
constant	1243 (118)	1171 (93)	935 (96)	974 (80)
R^2	0.0768	0.0584	0.1016	0.0832
N	654	654	714	714

Data from the 2003 American Time Use Survey. Each column in this table reports a separate regression. The dependent variable is minutes of leisure per day on weekends and holidays.
Huber-White standard errors are reported in parentheses. Coefficient estimates in cells that are outlined are statistically significant at the 90% level or higher.
Variable definitions are reported in the text. Sample selection criteria are reported in the notes to Table 1 and in the text. The classification of time use is reported in the Appendix.

TABLE 3-B
Weekend time spent in producing household services, OLS regression results

	Dependent variable: Minutes of chores per day on weekends and holidays			
	Men		Women	
Independent variables:	(1)	(2)	(3)	(4)
ln(hourly wage)	40.3 (19.8)	-	-29.5 (16.6)	-
ln(spouse's hourly wage)	14.0 (19.4)	-	23.8 (17.8)	-
HH income dummies?	yes	no	yes	no
[p-value on joint F test]	[0.0000]		[0.0000]	
hourly wage	-	33.7 (65.1)	-	-120.8 (60.5)
(own + spouse's hourly wage)				
own + spouse's hourly wage	-	1.192 (0.457)	-	0.359 (0.448)
has kids age < 6	77.9 (19.7)	75.3 (19.6)	88.0 (18.9)	85.0 (19.0)
has kids age ≥ 6	45.2 (16.2)	42.0 (15.9)	36.9 (15.5)	35.3 (15.6)
self: high school diploma	57.8 (42.8)	40.7 (37.9)	60.0 (70.5)	44.4 (66.8)
some college	61.1 (42.7)	45.8 (37.6)	58.0 (69.8)	53.3 (66.1)
bachelor's degree	52.3 (46.1)	36.5 (41.2)	67.4 (71.3)	73.5 (67.3)
post-graduate	22.8 (49.6)	7.5 (45.3)	63.3 (75.1)	66.6 (70.5)
spouse: high school diploma	-0.7 (42.1)	-8.1 (42.3)	-9.0 (40.7)	-2.9 (40.5)
some college	1.6 (43.3)	-5.7 (43.5)	33.0 (40.7)	37.1 (40.5)
bachelor's degree	14.0 (47.4)	9.7 (46.4)	-12.6 (42.0)	-9.7 (41.7)
post-graduate	33.5 (49.9)	24.6 (49.3)	-37.8 (48.5)	-25.5 (48.4)
self: black	-41.0 (28.2)	-52.4 (26.5)	-34.5 (42.2)	-25.3 (41.7)
other nonwhite	-71.5 (39.3)	-66.7 (40.8)	25.9 (39.8)	32.5 (41.4)
self: hispanic	8.3 (28.1)	10.0 (26.2)	5.1 (27.1)	-6.2 (27.5)
self: age	2.9 (1.7)	3.1 (1.7)	-2.4 (1.9)	-2.4 (1.9)
spouse: age	-1.9 (1.8)	-1.9 (1.8)	2.5 (1.9)	2.9 (1.8)
season: winter	-13.3 (22.2)	-13.1 (21.8)	-46.4 (20.4)	-41.4 (20.7)
spring	6.2 (21.7)	4.3 (21.7)	-16.2 (21.3)	-11.6 (21.8)
summer	-11.5 (24.0)	-15.1 (23.6)	-33.5 (20.9)	-28.1 (21.1)
constant	4 (104)	85 (83)	260 (96)	272 (73)
R^2	0.0994	0.0693	0.1119	0.0721
N	654	654	714	714

Data from the 2003 American Time Use Survey. As in Table 3-A, each column in this table reports a separate regression. The dependent variable in this table is minutes spent doing chores per day on weekends and holidays. Huber-White standard errors are reported in parentheses. Coefficient estimates in cells that are outlined are statistically significant at the 90% level or higher.
Variable definitions are reported in the text. Sample selection criteria are reported in the notes to Table 1 and in the text. The classification of time use is reported in the Appendix.

TABLE 4
Effect of wages on weekend and weekday time use, OLS regression results

Dependent variable: Minutes spent on various activities per day on weekends and holidays

	Husbands		Wives	
	Coefficient on log hourly wage			
Activities	own	spouse's	own	spouse's
Total time working	-25.5 (21.7)	-15.4 (16.8)	-27.3 (13.9)	-14.3 (15.5)
Total time in leisure	-13.8 (21.8)	0.4 (21.5)	56.2 (15.8)	-9.7 (18.0)
Total time on chores	40.3 (19.8)	14.0 (19.4)	-29.5 (16.6)	23.8 (17.8)
Total time in emergencies	-1.0 (1.1)	1.0 (0.5)	0.5 (0.4)	0.2 (0.4)
	own	spouse's *	own	spouse's *
Types of leisure				
Personal care	1.4 (12.0)		-2.6 (9.0)	
sleep	-5.6 (11.8)		-1.5 (8.4)	
other	7.0 (3.6)	-5.6 (4.2)	-1.1 (3.6)	
Eating & drinking	-0.0 (5.7)	7.7 (5.7)	-1.7 (5.6)	6.1 (5.6)
Miscellaneous leisure	-9.0 (18.7)		50.4 (14.5)	-33.9 (13.9)
mail,e-mail,phone w/ family, friends	-0.2 (1.5)		-1.3 (1.9)	-3.8 (2.5)
socialize, spend time w/ fam, friends	4.3 (11.6)	-10.4 (9.5)	10.3 (7.3)	
attending social events	4.3 (6.0)		5.8 (5.0)	3.6 (3.8)
relaxing & leisure	-25.1 (16.1)		25.7 (11.6)	-19.4 (12.2)
relaxing, thinking, smoking	2.0 (3.9)		4.4 (3.4)	-8.5 (4.8)
watching TV	-22.3 (15.0)		17.9 (9.9)	-15.9 (11.5)
games, computer use	3.1 (5.1)		-0.6 (2.4)	
reading, writing	-6.9 (5.4)	6.2 (5.8)	4.8 (4.9)	7.7 (3.9)
going out for arts & entertainment	4.7 (4.3)		6.2 (7.3)	-8.2 (4.7)
Sports, exercise, & recreation	8.6 (11.2)		4.2 (5.4)	8.4 (4.7)
participating	8.5 (10.7)		4.1 (4.3)	9.9 (3.9)
watching	0.1 (2.9)		0.1 (3.2)	
Religious & spiritual	-9.1 (6.7)		3.2 (5.2)	
Volunteering	-5.8 (6.8)	-8.0 (4.0)	2.3 (3.8)	-4.2 (3.9)
Types of chores				
"Women's" chores	2.4 (9.4)		-31.9 (11.5)	14.3 (11.6)
cleaning	-4.1 (7.2)		-18.8 (8.2)	
food preparation	4.1 (4.5)		-8.4 (7.0)	7.6 (6.1)
laundry, other	2.4 (2.0)		-4.8 (4.4)	4.3 (3.5)
"Men's" chores	41.6 (12.8)		-2.0 (5.1)	9.4 (6.9)
fixing things inside	17.8 (7.0)	-9.8 (6.6)	-3.0 (3.1)	
fixing things outside	-1.4 (6.9)	10.3 (5.6)	-1.7 (1.8)	3.5 (1.8)
lawn & garden	22.0 (7.6)		2.5 (3.3)	
cars, tools, appliances	1.1 (3.9)		0.3 (0.7)	

Household finances	3.4 (3.6)	-11.6 (11.2)	-0.4 (0.7)	
Caring for household members	1.2 (7.2)		13.0 (6.7)	11.0 (8.2)
children	0.2 (7.2)		13.2 (6.5)	10.1 (7.9)
general	0.0 (6.7)		14.6 (5.9)	8.2 (6.8)
educational	-1.3 (1.3)		-1.1 (1.8)	
driving	0.6 (1.1)		0.7 (0.9)	
pets	1.4 (0.9)	1.6 (1.1)	0.1 (1.5)	
other adults	-0.3 (0.3)		-0.2 (0.1)	0.3 (0.3)
Caring for non-household members	2.3 (5.1)		1.6 (4.3)	
children	0.2 (1.9)		-2.7 (2.8)	
other adults	2.1 (4.8)		4.3 (3.4)	
caring	1.7 (1.8)		1.9 (2.0)	1.6 (1.3)
helping	2.0 (3.5)		0.2 (1.2)	
driving	-1.6 (2.1)		2.2 (1.5)	
Shopping	-11.3 (10.2)	9.3 (8.7)	-7.8 (7.2)	
for goods	-9.7 (9.8)	12.6 (8.5)	-8.3 (7.0)	
for household services	0.6 (1.6)		0.2 (0.6)	-2.0 (1.2)
for other services	-2.2 (3.1)	-3.4 (2.6)	0.3 (0.9)	2.2 (1.5)
Total time in leisure, redefined	28.0 (22.4)	13.2 (20.7)	67.4 (14.9)	9.8 (17.5)
Total time in chores, redefined	-1.5 (15.8)	1.3 (16.4)	-40.6 (13.9)	4.3 (15.3)

Dependent variable: Minutes spent on various activities per weekday

	Husbands		Wives	
	Coefficient on log hourly wage			
Activities	own	spouse's	own	spouse's
Total time working	30.9 (21.3)	7.4 (18.8)	54.6 (22.5)	-48.3 (16.3)
Total time in leisure	-11.9 (19.5)	-13.1 (14.9)	-20.5 (16.6)	11.3 (12.1)
Total time on chores	-17.0 (12.3)	6.1 (12.3)	-32.6 (14.9)	36.8 (13.8)
Total time in emergencies	-4.8 (3.1)	-0.6 (0.9)	-1.4 (0.8)	0.2 (0.5)

Data from the 2003 American Time Use Survey. Each cell reports the coefficient estimate on log of wage, obtained from separate regressions that differ by the dependent variable. All other independent variables are the same as those reported in specifications (1) and (3) of Tables 3-A and 3-B.

* In cases where it was greater than its standard error, the table also reports the coefficient estimate on the log of the spouse's hourly wage.

Huber-White standard errors are reported in parentheses. Coefficient estimates in cells that are outlined are statistically significant at the 10% level or better.

Variable definitions are reported in the text. Sample selection criteria are reported in the notes to Table 1 and in the text. The classification of time use is reported in the Appendix. "Leisure, redefined" and "chores, redefined" begin with the definitions of leisure and chores laid out in the Appendix and switch the categories "caring for household children" and "'men's' chores" from chores to leisure.

TABLE 5
Effect of wages on weekend time use, both spouses work full-time, OLS regression results

Dependent variable: Minutes spent on various activities per day on weekends and holidays

	Husbands		Wives	
	Coefficient on log hourly wage			
Activities	own	spouse's	own	spouse's
Total time working	-45.1 (25.4)	-11.1 (21.5)	-47.2 (17.9)	-13.9 (18.0)
Total time in leisure	5.5 (26.1)	-15.0 (26.6)	58.5 (20.3)	-11.9 (21.3)
Total time on chores	41.0 (23.5)	25.5 (23.0)	-11.6 (22.1)	25.8 (21.0)
Types of leisure	own	spouse's *	own	spouse's *
Personal care – other	10.7 (4.4)	-5.4 (5.3)	-1.3 (4.6)	
Miscellaneous leisure	1.8 (22.4)		45.5 (17.1)	-43.2 (16.6)
socializing, spending time w/ family	7.8 (13.8)	-15.9 (12.4)	8.1 (9.3)	-8.4 (9.4)
attending social events	6.2 (7.7)		7.6 (5.3)	
relaxing & leisure	-21.0 (19.2)		22.9 (14.8)	-21.1 (14.9)
relaxing, thinking, smoking	3.5 (4.3)		3.8 (4.7)	-12.6 (6.2)
watching TV	-18.6 (17.7)	-18.3 (17.2)	18.9 (13.6)	-13.7 (14.7)
Sports, exercise, & rec – participating	17.5 (13.2)	-16.4 (15.9)	2.0 (7.0)	14.2 (5.1)
Types of chores				
"Women's" chores	3.7 (11.8)		-27.6 (15.6)	18.9 (13.7)
cleaning	-6.5 (8.9)		-16.4 (10.8)	
food preparation	5.2 (5.8)		-12.5 (9.1)	9.6 (7.6)
"Men's" chores	39.9 (15.6)	20.9 (16.0)	1.6 (5.4)	13.3 (7.8)
fixing things inside	20.0 (8.7)	-14.7 (9.3)	-0.9 (4.1)	
lawn & garden	16.9 (9.1)	16.5 (10.6)	2.7 (3.1)	5.5 (5.4)
Caring for household members	-1.5 (8.5)	10.3 (8.3)	16.3 (8.7)	
children – general	-3.5 (7.6)	10.9 (7.2)	20.5 (7.6)	
Caring for non-hh mem – other adults	7.1 (4.0)		7.1 (4.5)	
Shopping	-9.4 (11.6)		-5.4 (9.6)	-12.9 (11.2)
for goods	-8.2 (11.0)		-5.9 (9.3)	-15.0 (11.0)
for household services	0.1 (1.5)		0.4 (1.0)	-1.1 (0.9)
Total time in leisure, redefined	42.2 (26.3)	15.4 (25.3)	76.5 (19.1)	8.0 (21.2)
Total time in chores, redefined	4.3 (17.9)	-4.9 (18.8)	-29.6 (19.0)	5.8 (18.8)
N	519		563	

Data from the 2003 American Time Use Survey. The results in this table replicate specifications that appear in Table 4, but with the sample restricted to respondents in couples in which both spouses work full-time (defined as having usual weekly hours of at least 30.

* In cases where it was greater than its standard error, the table also reports the coefficient estimate on the log of the spouse's hourly wage.

Huber-White standard errors are reported in parentheses. Coefficient estimates in cells that are outlined are statistically significant at the 10% level or better.

TABLE 6
Effect of wages on weekend time use, controlling for work hours, OLS regression results

Dependent variable: Minutes spent on various activities per day on weekends and holidays	Husbands		Wives	
	Coefficient on log hourly wage			
Activities	own	spouse's	own	spouse's
Total time working	-26.0 (21.4)	-4.4 (17.4)	-30.2 (14.5)	-0.4 (15.9)
Total time in leisure, redefined	19.0 (23.1)	10.7 (21.2)	70.0 (15.4)	5.6 (18.3)
Total time in chores, redefined	8.3 (16.2)	-7.4 (16.8)	-40.1 (14.3)	-4.9 (16.3)
N	626		671	

Data from the 2003 American Time Use Survey. The results in this table replicate specifications that appear in Table 4, but this specification includes as control variables usual weekly work hours of each spouse.
* In cases where it was greater than its standard error, the table also reports the coefficient estimate on the log of the spouse's hourly wage.
Huber-White standard errors are reported in parentheses. Coefficient estimates in cells that are outlined are statistically significant at the 10% level or better.

TABLE 7
Effect of wages on weekend time use, by presence of children, OLS regression results

Dependent variable: Minutes spent on various activities per day on weekends and holidays	Husbands		Wives	
	Coefficient on log hourly wage			
Full sample	own	spouse's	own	spouse's
Total time working	-25.5 (21.7)	-15.4 (16.8)	-27.3 (13.9)	-14.3 (15.5)
Total time in leisure, redefined	28.0 (22.4)	13.2 (20.7)	67.4 (14.9)	9.8 (17.5)
Total time in chores, redefined	-1.5 (15.8)	1.3 (16.4)	-40.6 (13.9)	4.3 (15.3)
N	654		714	
Has kids age < 6	own	spouse's	own	spouse's
Total time working	43.1 (45.7)	18.7 (33.7)	-52.4 (30.9)	-12.4 (33.0)
Total time in leisure, redefined	12.7 (47.6)	-27.6 (33.3)	58.2 (25.4)	7.6 (27.2)
Total time in chores, redefined	-53.0 (29.9)	7.2 (21.0)	-6.9 (27.2)	-20.0 (30.3)
N	196		216	
Has kids age ≥ 6, no kids age < 6	own	spouse's	own	spouse's
Total time working	-97.9 (40.8)	-21.7 (33.3)	21.9 (24.4)	-47.3 (34.5)
Total time in leisure, redefined	57.3 (41.9)	10.1 (40.4)	38.1 (32.4)	16.2 (43.3)
Total time in chores, redefined	41.9 (29.0)	12.2 (31.1)	-59.8 (22.4)	30.7 (33.3)
N	213		225	
No kids	own	spouse's	own	spouse's
Total time working	-20.1 (34.2)	-40.6 (29.0)	-51.5 (22.9)	-12.0 (21.9)
Total time in leisure, redefined	46.7 (36.0)	31.7 (37.5)	96.3 (26.5)	9.5 (27.0)
Total time in chores, redefined	-25.9 (25.5)	7.6 (31.0)	-45.5 (23.2)	2.0 (24.2)
N	245		273	

Data from the 2003 American Time Use Survey. The results in this table replicate specifications that appear in Table 4, but the sample here is divided up on the basis of whether or not there are children under the age of 6 and age 6 and over in the household.

* In cases where it was greater than its standard error, the table also reports the coefficient estimate on the log of the spouse's hourly wage.

Huber-White standard errors are reported in parentheses. Coefficient estimates in cells that are outlined are statistically significant at the 10% level or better.