Housing Situation and Time Use

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Abstract

This study investigates the relationship of housing situation to time use among U.S. adults. Tapping data from the 2003 American Time Use Survey, the research compares time use of apartment renters and house owners, two groups that differ in demographic characteristics as well as in their housing. While many similarities in their time use are found, including time spent at work, these two population groups also display some clear differences, notably in time spent on home maintenance and in time spent relaxing. The additional time spent relaxing by apartment renters is maintained after controlling for demographic differences. Results from multivariate analysis hint that "supply" influences related to characteristics of the housing as well as "demand" influences related to occupants' characteristics contribute to the observed differences in time use between apartment renters and house owners.

Introduction

Time and money are perhaps the two most important constraints of life. How people use their time is set by many personal decisions, which in turn are determined by preferences and constraints. Those preferences and constraints are economic, psychological, physiological, and social, and they are correlated with individuals' demographic profile and economic status.

Housing choices balance preferences against financial constraints. But housing decisions are also decisions, knowingly or unknowingly, about time use. Individuals making housing choices are making decisions about time to be spent commuting, about time to be spent on domestic activities, and maybe even decisions about time to be spent working, if a certain income is required to support housing costs.

The implications of housing choices for commuting have been analyzed extensively. Less expensive housing can often be secured at to cost of longer

and more expensive trips between home and work, and this tradeoff is important for individuals as well as for the evolution of urban areas (Mill and Hamilton, 1994). The connection of work effort to housing has received some attention as well, with one topic being the effect of receipt of housing assistance on labor force participation (Painter, 2001, for example).

Other than commuting and work effort, the time use implications of housing choices have received little if any attention from economists or other social scientists. But implications for other time uses seem probable. Home maintenance is one such time use. People may choose housing based in part on their taste for home maintenance, as some housing choices require less than others. Or even if one's housing is not chosen with the time use implications in mind, the housing may nonetheless steer the resident's time use.

For reasons then both of demand (how people want to spend their time) and supply (what time the housing requires), we might expect people in different housing situations to use their time differently. The purpose of this article is to describe how adults' time use is correlated with their housing situation and to attempt to untangle some of the underlying demand and supply causes of those correlations. The tabulations focus on comparing owner-occupants of single-family houses with renters of apartments in multi-unit structures. Individuals housed in these two segments of the housing market account for approximately 86 percent of all U.S. adults, according to the 2003 American Housing Survey. The remaining 14 percent are renters of single-family houses or owner-occupants of condominium units in multi-unit structures.

To my knowledge, there has been no previous quantitative research on the topic of housing situation and time use, other than commuting studies, of which there are many, and work effort studies, of which there are a few. The likely reason for the absence of research is the lack of data needed for such a study. That situation has changed with the recent release of the American Time Use Survey, a landmark survey conducted by the U.S. Census Bureau on behalf of the U.S. Department of Labor's Bureau of Labor Statistics.

The next section describes the data, and subsequent sections rank the top time uses by housing situation, compare time allocations over the 24 hours across housing situations, take a detailed look at time spent on "chores," and try to tease out demand and supply side influences on one time use that varies with housing situation.

To summarize the findings, three time uses dominate adults' days: sleeping, working, and relaxing. Apartment renters and single-family house owners are more similar than different in their uses of time, but some differences do emerge. Notably, apartment renters spend less time on housing maintenance, and more time relaxing than do house owners. This additional leisure time of apartment renters is maintained after controlling for differences in demographic

characteristics between apartment renters and house owners and appears related more to renting than to residing in a multifamily structure.

This first investigation just scratches the surface of the potential applications of the American Time Use Survey to housing research.

The Data

The American Time Use Survey (ATUS) collects information on how adults living in the United States spend their time. The first national fielding of the ATUS was in 2003, and that is the source used in this study. Individuals participating in the ATUS are asked to maintain a diary of their time use over a 24-hour period. In 2003, the ATUS's nationally representative sample yielded about 21,000 completed interviews. These respondents were drawn from the set of individuals completing their participation in the Current Population Survey, and this link allows individual and household economic and demographic information to be linked to the time use estimates from their responses to the ATUS. The ATUS is described in more detail and tables of results are presented on the Bureau of Labor Statistics Web site at www.bls.gov/tus .

The public use data files of individual ATUS responses can be manipulated in various ways depending on the application. In addition to the standard file combinations and linkings described in the ATUS documentation on the Web site, for this study two additional data processing tasks were required. First, the ATUS records had to be matched with records of respondents from the 2002 or 2003 Annual Demographic Survey (the March supplement to the Current Population Survey) to get the full set of individual and household demographic and housing data. These variables, including housing tenure and structure type, are not recorded in the regular monthly CPS. Because only some ATUS respondents also were interviewed for the CPS Annual Demographic Survey, the sample size is reduced substantially, to 6520 adult respondents for most of the tabulations reported here.[1] The single-family homeowner subsample size is 4,612 and the multifamily renter subsample size is 999.

The second data processing task was to convert the diary data into clock hour totals for each respondent. I have not seen this done before, although it may have been. But this data reconfiguration is a good way to see how time uses cluster and evolve over the 24 hours of the day.

The ATUS provides three levels or tiers of coding for time use, of which this study uses the top two. The highest or first level has 17 categories (personal care, household activities, consumer purchases, working and work related activities, etc.). Each of these first tier categories is subdivided into two or more

[1] The ATUS defines adults as those of age 15 and above. Eight percent of the ATUS respondents are of age 15-17, and 13 percent are of age 15-20.

subcategories of second tier activities. For example, the category "household activities" has 10 second tier subcategories, including food and drink preparation, interior maintenance, and household management. Each of the second tier activities is in turn subdivided into two or more third tier activities. Interior maintenance, for example, has four third tier categories, including building and repairing furniture, and heating and cooling. The decision here to use the top two tiers of coding strikes a balance between limiting to a manageable number of categories and tapping the specificity of the most detailed codings.

Top Time Uses

Not surprisingly, sleep is the single most time consuming activity among American adults (see the first columns in Table 1). The 512 minutes (8.5 hours) is more than twice the daily average time spent at leisure or at work, each of which consume about 3.5 hours. These three time uses dwarf all others and together account for 65 percent of the 24 hours in a day. The other time uses that rank in the top 25 uses (out of the 107 second tier uses coded in the ATUS) together with these three total 94 percent of the time in the time diary day.

The figures in the first column are representative national averages, but they average across all demographic characteristics and days of the week. Time use among the elderly obviously will differ from that of a young working adult with children, and time use on Sunday will differ from that on Monday. We will return to these differences later.

Time use differences by housing situation are the focus here. A comparison of the rankings for single-family homeowners and apartment renters in Table 1 show that these two groups are more similar than different in their use of time. The rankings and average time allocations are close among adults in the two housing groups, certainly with regard to the dominant categories at the tops of the lists.

Despite the overall similarities, the time allocations of single-family homeowners and apartment renters do reveal some notable contrasts. Interestingly, apartment renters spend more time each day in each of the three core activities – sleeping, working, and relaxing – than do single-family homeowners. These three combined total 16.3 hours for the apartment residents, compared to 15.2 hours on average for homeowners. The apartment renters' remaining time is consequently spread more thinly across the other activities in the top 25 list.

Of the specific activities, the biggest difference between apartment renters and house owners -- as measured by total time spent -- is in "relaxing and leisure," [2]

[2] "Relaxing and Leisure" is one of the second tier codes under the first tier grouping "Socializing, Relaxing, and Leisure." Other second tier codes are "Socializing and Communicating," "Attending or Hosting Social Events," "Arts and Entertainment (other than sports)," and "Waiting Associated

in which apartment renters spend 30 minutes more daily than do house owners, a 15 percent difference.[3] Two other activities for which time allocations and the rankings are quite different are exterior maintenance and lawn care. While both of these are among the top 25 for homeowners, they do not appear on the top 25 list for apartment renters. This is not surprising, since apartment renters typically have no responsibilities in either of these areas.

The time allocations in Table 1 average widely varying responses. Indeed, with the exception of the top four time uses, most adults did not engage in the listed activity during the diary day. A different perspective on time use comes from ranking activities by the proportion of adults who spent any time on that activity during the day. Shown in Table 2, these rankings are similar to those for average minutes in Table 1, but far from identical. Food/Drink Preparation and Cleanup is higher in the "% Yes " rankings than in average minutes, meaning that while many people engage in this activity during the day, they tend not to spend much time at it. Conversely, those reporting any time spent working ranks lower than average minutes working, because while many people do not work for money, those who do tend to spend a lot of hours on the job. The rankings in Table 2 are similar for home owners and apartment renters.

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with Socializing, Relaxing, and Leisure." Included within the second tier "Relaxing and Leisure" category are these third tier activities: relaxing, thinking; tobacco and drug use; television and movies; listening to the radio; listening to or playing music (not radio); playing games; computer use for leisure (except games); arts and crafts as a hobby; collecting as a hobby; other hobbies; reading for personal interest; and writing for person interest.

[3] Because of the large sample size, most differences in time use large enough to be of substantive interest will also be different from zero by conventional measures of statistical significance. The ATUS is a complex probability sample of the U.S. adult population, and standard error estimates based on the assumption of simple random sampling are only approximations. With that caution, the estimated standard error of the difference in mean minutes spent relaxing by apartment renters and house owners is 7 minutes. Therefore, if the actual difference between the two groups were zero, an estimated time difference as large as the observed 30 minutes would occur in fewer than one out of one hundred samples of this size.

Table 1: Top 25 Uses of Time, by Housing Situation *(mean minutes per 24 hours)*

	All Adults		Apartment Renters		Single-Family House Owners	
Rank	Mean	Activity	Mean	Activity	Mean	Activity
1	512.3	Sleeping	533.7	Sleeping	506.1	Sleeping
2	210.1	Relaxing&Leisure	231.3	Relaxing&Leisure	208.2	Working
3	207.6	Working	210.4	Working	201.6	Relaxing&Leisure
4	64.0	Eating&Drinking	57.2	Eating&Drinking	66.0	Eating&Drinking
5	44.4	Socializing&Communicating	48.4	Socializing&Communicating	43.4	Socializing&Communicating
6	41.8	Grooming	43.7	Grooming	41.9	Grooming
7	36.4	Housework	36.2	Housework	35.3	Housework
8	31.2	Food/Drink Preparation & Cleanup	33.4	Food/Drink Preparation & Cleanup	30.9	Food/Drink Preparation & Cleanup
9	22.6	Shopping	21.8	Travel Related to Work	23.7	Shopping
10	22.2	Sports/Exercise/Recreation	21.3	Care of Own Children	23.2	Sports/Exercise/Recreation
11	20.5	Care of Own Children	17.6	Shopping	22.2	Lawn/Garden/Houseplants
12	18.5	Travel Related to Work	16.3	Sports/Exercise/Recreation	20.7	Care of Own Children
13	17.5	Lawn/Garden/Houseplants	13.5	Travel for Consumer Purchases	18.2	Travel Related to Work
14	15.3	Travel for Consumer Purchases	12.1	Travel for Socializing/Relaxing/Leisure	15.8	Travel for Consumer Purchases
15	11.5	Travel for Socializing/Relaxing/Leisure	10.9	Taking Class	11.4	Household Management
16	10.7	Household Management	9.8	Educational Research/Homework	11.4	Travel for Socializing/Relaxing/Leisure
17	9.5	Taking Class	8.0	Unable to Code	9.1	Religious/Spiritual Practices
18	8.4	Religious/Spiritual Practices	7.7	Household Management	8.3	Taking Class
19	7.7	Unable to Code	6.8	Travel Related to Eating/Drinking	8.3	Travel Related to Eating/Drinking
20	7.6	Travel Related to Eating/Drinking	6.0	Religious/Spiritual Practices	7.9	Unable to Code
21	7.1	Attending or Hosting Social Events	6.0	Health Related Self-care	7.4	Attending or Hosting Social Events
22	6.1	Arts & Entertainment (non-sports)	6.0	Attending or Hosting Social Events	7.2	Exterior Maintenance/Repair/Decoration
23	5.5	Care for Animals & Pets	5.8	Arts & Entertainment (non-sports)	6.1	Arts & Entertainment (non-sports)
24	5.5	Travel for Caring for Nonhousehold Members	5.5	Care for Nonhousehold Children	6.1	Care for Animals & Pets
25	5.4	Exterior Maintenance/Repair/Decoration	4.7	Telephone Calls	5.7	Travel for Caring for Nonhousehold Members
Total Minutes in Top 25	1349.3	(94% of 24 hours)	1374.0	(95% of 24 hours)	1346.2	(94% of 24 hours)

source: author's tabulations of data from the 2003 American Time Use Survey

Table 2: Most Frequently Reported Activities, by Housing Situation *(% of adults engaging in activity during the surveyed 24 hours)*

All Adults		Apartment Renters		Single-Family House Owners	
% Reporting Activity	Activity	% Reporting Activity	Activity	% Reporting Activity	Activity
99.9%	Sleeping	99.8%	Sleeping	99.9%	Sleeping
89.8%	Relaxing&Leisure	89.9%	Relaxing&Leisure	90.6%	Eating&Drinking
89.8%	Eating&Drinking	88.7%	Eating&Drinking	89.5%	Relaxing&Leisure
79.9%	Grooming	78.9%	Grooming	80.6%	Grooming
49.8%	Food/Drink Preparation & Cleanup	51.5%	Food/Drink Preparation & Cleanup	49.5%	Food/Drink Preparation & Cleanup
45.7%	Working	45.4%	Working	45.8%	Working
41.5%	Shopping	42.0%	Travel Related to Work	42.0%	Shopping
40.7%	Travel for Consumer Purchases	38.1%	Shopping	41.2%	Travel for Consumer Purchases
40.6%	Travel Related to Work	37.6%	Housework	40.5%	Travel Related to Work
39.3%	Socializing&Communicating	37.6%	Travel for Consumer Purchases	40.2%	Socializing&Communicating
38.1%	Housework	36.6%	Socializing&Communicating	37.6%	Housework
31.0%	Travel for Socializing/Relaxing/Leisure	29.9%	Travel for Socializing/Relaxing/Leisure	30.8%	Travel for Socializing/Relaxing/Leisure
26.2%	Travel Related to Eating/Drinking	23.7%	Travel Related to Eating/Drinking	27.4%	Travel Related to Eating/Drinking
23.8%	Household Management	20.0%	Care of Own Children	24.8%	Household Management
20.2%	Care of Own Children	19.3%	Household Management	20.4%	Sports/Exercise/Recreation
19.8%	Sports/Exercise/Recreation	16.9%	Sports/Exercise/Recreation	20.1%	Care of Own Children
15.9%	Lawn/Garden/Houseplants	9.7%	Travel for Caring for Nonhousehold Mem	19.7%	Lawn/Garden/Houseplants
14.1%	Care for Animals & Pets	9.6%	Unable to Code	15.4%	Care for Animals & Pets
13.6%	Travel for Caring for Nonhousehold Members	7.4%	Care for Animals & Pets	14.4%	Travel for Caring for Nonhousehold Members
10.8%	Unable to Code	5.2%	Religious/Spiritual Practices	11.5%	Unable to Code
7.7%	Religious/Spiritual Practices	4.4%	Taking Class	8.4%	Religious/Spiritual Practices
4.1%	Arts & Entertainment (non-sports)	4.2%	Arts & Entertainment (non-sports)	4.6%	Exterior Maintenance/Repair/Decoration
3.7%	Attending or Hosting Social Events	3.0%	Attending or Hosting Social Events	4.1%	Arts & Entertainment (non-sports)
3.6%	Exterior Maintenance/Repair/Decoration	2.4%	Lawn/Garden/Houseplants	3.8%	Attending or Hosting Social Events
3.6%	Taking Class	0.4%	Exterior Maintenance/Repair/Decoration	3.2%	Taking Class

source: author's tabulations of data from the 2003 American Time Use Survey

The Timing of Activities

In addition to the amount of time adults spend on activities during the day, they may differ in when they spend that time. For example, nightowls might be more inclined to relax and socialize at night than are morning people, and the timing of eating and drinking may depend on culture and ethnicity.

But the flow of activities during the day seems similar for apartment renters and homeowners. Figures 1 and 2 give the time allocations, by hour of the day, for homeowners and apartment renters. Shown separately are each of the top six time use categories from Table 1 (accounting for 75 percent of all time use), plus an "all other" residual group.[4] For both owners and renters, sleep dominates the nighttime hours. The 4am bar in the charts indicates that on average adults spend slightly over 90 percent of the time between 4am and 5 am sleeping (which in the ATUS lexicon includes both "sleeping" and "sleeplessness"). And the adage "working 9 to 5" is very much supported by the ATUS data, which show work to be the single most time consuming activity during this period. In contrast, "relaxing and leisure" becomes more prevalent through the late afternoon and evening hours, and is the single biggest time use between 7pm and 10pm. Of course what gets done, and when, depends on the day of the week, as well as individual characteristics, and I will turn to those shortly, but these figures, like those in Tables 1 and 2, are nationally representative averages across all days of the week and respondent demographics.

[4] For those viewing this paper in black and white, the categories in Figures 1 and 2 are charted in the order they appear in the legend. For example, "all other" is the top bar segment, and "sleeping" is the bottom segment.

Figure 1

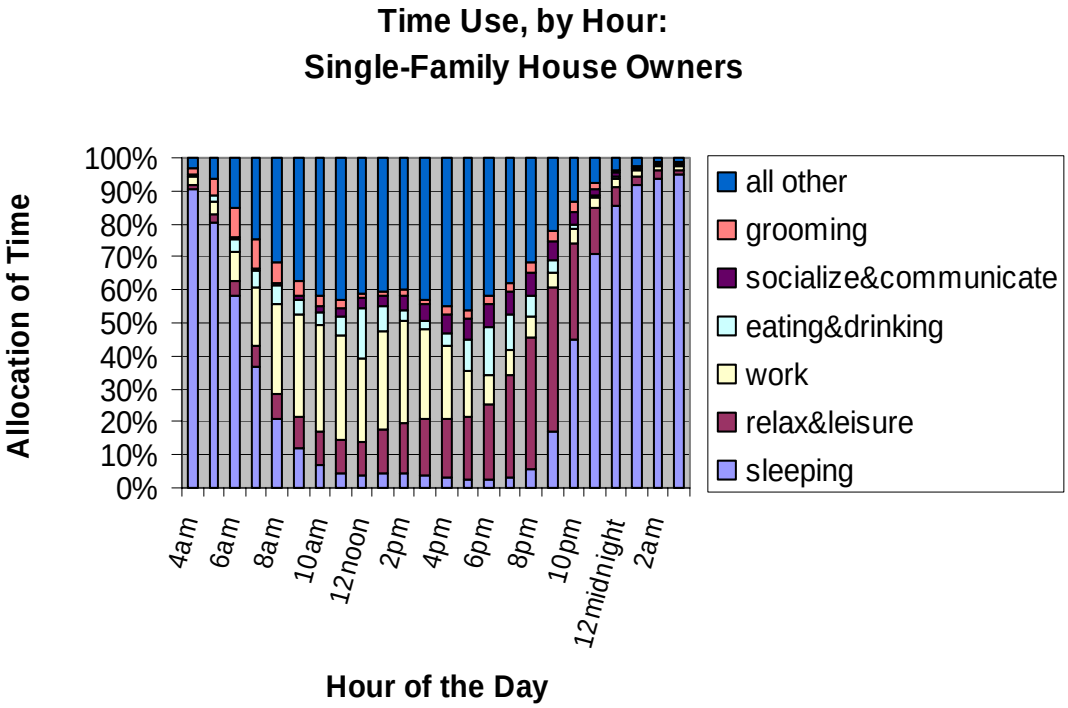
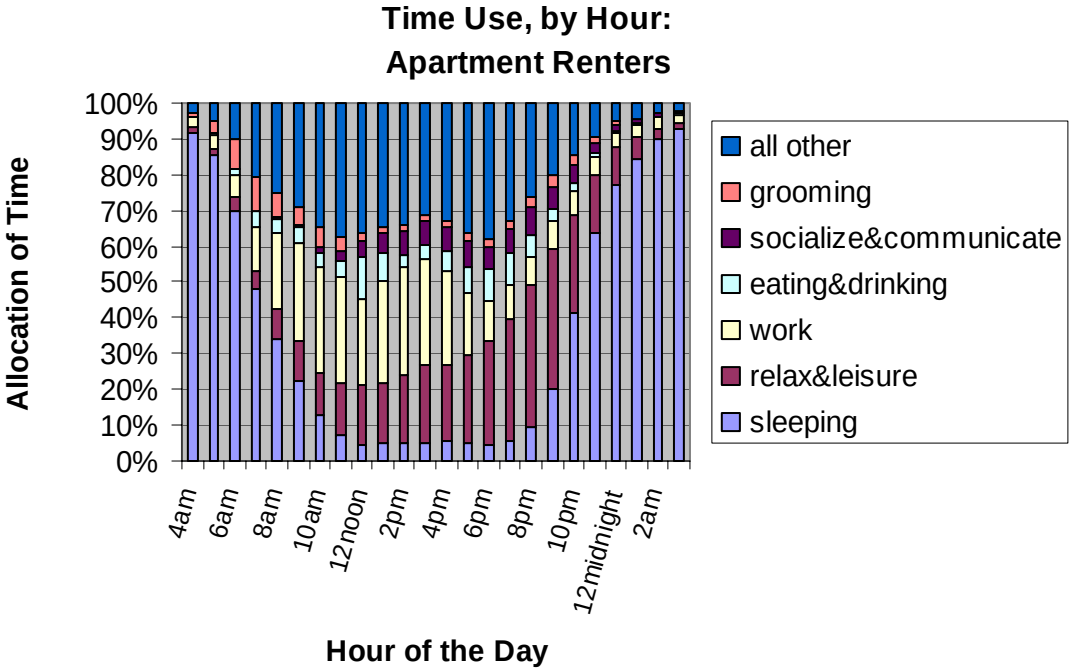


Figure 2



Housing and Chores

Housing maintenance is one category of time use where both intuition and the data suggest differences between homeowners and apartment renters. Here I take a closer look at three specific categories: interior maintenance, exterior maintenance, and yardwork.[5]

Relatively few adults engage in any of these activities in a typical day (Table 3). Only 3 percent report interior maintenance, and about 3 percent report exterior maintenance. "Yardwork" is more common and is reported by 16 percent of all adults. The yardwork percentage seems high, and may reflect the inclusion of houseplant care. (If everyone spends 5 minutes watering houseplants once a week, this alone could account for the 16 percent.) The difference in reporting by house owners and apartment renters makes sense, with owners more likely than renters to report each of these three activities.

Not only are house owners more likely to engage in these maintenance activities than are apartment renters, but they also spend more time at them if they do them at all. As shown in the bottom panel of Table 3, minutes spent by owners exceed those of renters in each of the three activities, although the small sample of renters engaging in the activities limits the precision of the estimates.

Is It the Housing, or Something Else?

Both preferences and constraints influence time use. If apartment renters and house owners use time differently, it might be because they have different preferences. Or they might have different personal constraints related to their work and family situations. These personal characteristics, which might be viewed loosely as "demand" determinants of time use, should be correlated with the respondent's demographic characteristics. But in addition, the housing itself might shape time use, regardless of the resident's characteristics. This independent influence of housing might be viewed as a "supply" effect on time use.

Of the major time uses identified in Tables 1 and 2, "Relaxing & Leisure" has the biggest difference in time allocation between apartment renters and house owners, with renters spending about 30 minutes more per day in this activity than do owners. This time use serves as a case study for an attempt to identify the strongest correlates of time use and the effect that housing might have independent of other factors.

[5] These are shorthand labels for the following second tier activities in the top tier group of "Household Activities": "Interior Maintenance, Repair, and Decoration," "Exterior Maintenance, Repair, and Decoration," and "Lawn, Garden, and Houseplants."

Table 3: Detailed Look at Housing Maintenance

	All Adults	Single-Family Homeowners	Multifamily Renters
Percent Reporting Activity During Day			
interior maintenance	2.9	3.2	1.9
exterior maintenance	3.6	4.6	0.4
yardwork	15.9	19.7	2.4
Minutes Spent on Activity by Those Reporting the Activity			
interior maintenance			
median minutes	120	103	20
mean minutes	152	158	69
sample size	210	171	18
exterior maintenance			
median minutes	90	90	60
mean minutes	148	155	68
sample size	246	224	6
yardwork			
median minutes	70	80	60
mean minutes	110	113	83
sample size	1092	956	29

source: author's tabulations of the 2003 ATUS

Table 4 presents the results of three multivariate regressions of time spent relaxing on several likely correlates. The first regression includes as independent variables housing tenure (own or rent), and structure type (single-family or multifamily). Homeowners and apartment renters differ in both characteristics, and it may be that time use differences are associated with only one of them. The regression coefficients and t ratios from this first regression indicate, however, that tenure and structure type are each correlated with time spent relaxing, and that the magnitudes of the effect of these two variables are similar. Yet overall, tenure and structure type explain very little of the variation across households in time spent relaxing, as the adjusted R-squared statistic is on 0.01.

ATUS responses were recorded for all days of the week, and it is not surprising that time spent relaxing and at leisure should depend on the day of the week. The second regression shows that on Mondays, for example, adults relax 35 minutes less than on Sunday, on average. Saturday is the second most relaxing day, by this measure, but even then adults relax 15 minutes less on average than they do on Sunday. The effects of housing tenure and structure type are essentially unchanged by addition of the day of the week to the specification, as would be expected because there is little if any correlation between housing situation and the day-of-the-week timing of the ATUS survey.

The estimated association of housing and time use is, however, influenced by the addition of demographic variables to the regression specification. An adult's age, sex, and household composition each has an independent association with time spent relaxing: Those middle aged (30-44) relax the least, and the elderly the most; women relax less than men; and those living alone relax more than those living with others. Much more could be said about these demographic effects, but the focus here is on housing. Note that inclusion of the demographic variables alters the estimated housing influence on time relaxing. The overall magnitude of the housing effect is about unchanged, but it shifts from being equally tenure and structure related to being predominantly a tenure influence, with renters spending 37 minutes more relaxing in a day than homeowners of the same age, sex, and household composition. In other words, the demographic differences between residents of multifamily and single-family structures can account for the differences in their leisure time, but housing tenure retains an independent association with leisure time even after controlling for demographic differences between owners and renters.

Although the regression results suggest that housing has an independent effect on time spent relaxing, the evidence is not conclusive. There may be omitted or unobservable demand differences that steer people into that housing. Even controlling for demographics, some adults have higher preferences for the attributes – including time use implications – of one housing choice over another and make their choices accordingly. Research outside the scope of this first effort will be required for a definitive answer.

In conclusion, this study has shown that housing situation and residents' time use are related. But much more work is needed to fully describe and interpret these differences and to more completely tap the potential of the American Time Use Survey for housing research.

Table 4: Regression Results: Time Spent on Relaxing & Leisure

mean value of dependent variable: 210 minutes

	Model 1		Model 2		Model 3	
Independent Variable	coefficient	t ratio	coefficient	t ratio	coefficient	t ratio
Tenure						
rent	20.0	2.9	20.6	3.0	37.5	5.7
Structure Type						
multifamily	18.6	2.6	18.6	2.6	4.6	0.7
Day of Week						
Monday			-35.1	-4.1	-40.8	-5.1
Tuesday			-42.2	-4.7	-43.2	-5.1
Wednesday			-52.2	-6.0	-54.5	-6.7
Thursday			-42.9	-4.9	-40.8	-4.9
Friday			-43.0	-4.9	-43.3	-5.2
Saturday			-15.5	-2.4	-18.3	-3.0
Age						
30-44					-25.7	-4.0
45-64					22.7	3.5
65+					160.4	20.1
Sex						
female					-29.0	-6.5
Household Composition						
lives alone					22.7	4.1
constant	207.2	75.7	232.2	48.1	219.5	31.0
adj R-sq	0.01		0.01		0.132	
sample size	6520		6520		6520	

omitted categories in regressions: owner (tenure), single-family (structure), Sunday (day of week), 15-30 (age), male (sex), lives with one or more relatives (household composition).
t-ratios are calculated as estimated coefficient divided by estimated standard error of the coefficient estimate. t-ratios greater than 1.96 in absolute value indicate coefficients different from zero at greater than 95 percent confidence.
source: author's tabulations of the 2003 ATUS

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