Time-Use in the Older Population

Variation by Socio-economic Status and Health

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Variation by Socio-economic Status and Health

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ABSTRACT

This paper provides evidence on time-use from the Health and Retirement Study (HRS), a large general-purpose survey that is representative of the U.S. population age 51 and over. The data stand out for its rich set of covariates which we use to present variation in time-use by health and socio-economic status. The HRS interviews about 20,000 persons about a wide array of topics, covering economic status, physical and mental health, family relations and support, labor market status and retirement planning. In 2001, a random sub-sample of 5,000 respondents in 5,000 households was sent a supplemental questionnaire, the Consumption and Activities Mail Survey (CAMS), asking respondents about recall information on time-use and spending. It generated 3,866 responses. In 2003, CAMS wave 2 was mailed to the same 5,000 people. We combine these data with information on the same respondents from the core HRS survey. Analyses of basic data quality show very low rates of item non-response overall, with slightly higher rates among groups with lower socio-economic status.

We combine the information on time-use obtained for 31 activities into the following categories: economic activity, leisure, housework, sleeping and napping, personal care, exercise, managing finances, time at computer, socializing, helping others and volunteering. We compare the CAMS measures with measures from the American Time-Use Study, and find fairly close correspondence. We present descriptive statistics for these time-use categories by personal characteristics, such as age, sex and health status, illustrating the richness of the HRS data.

1. Introduction

This paper uses time-use data that are collected as part of the Health and Retirement Study (HRS), a large general-purpose panel survey that is representative of the U.S. population age 51 and over. Every two years the HRS interviews about 20,000 persons about a wide array of topics, covering economic status, physical and mental health, family relations and support, labor market status and retirement planning.[1] The core HRS interview takes place in even years, such as 1998, 2000, 2002 etc. In the odd years, beginning in 2001, the Consumption and Activities Mail Survey (CAMS) has been administered biennially to a random sub-sample of the HRS. CAMS collects recall information on time-use and spending by means of a paper and pencil questionnaire. Wave 1 and wave 2 of CAMS sampled 5,000 respondents in 5,000 households who participated in the HRS 2000 survey. In a couple, the addressee is chosen at random. The same households are followed over time. The first wave of CAMS generated 3,866 responses; wave 2 received 3,254 responses. CAMS wave 3 was fielded in Fall 2005, and subsequent waves are planned for 2007 and beyond. We use the first two waves in this paper.

The design of the time-use section aims to produce population estimates of a wide range of activities that can be related to the rich cross-sectional and longitudinal background information collected in the HRS core interview on the same people. A second aim is to provide data to study the patterns of social interaction at older ages. While one-day diaries might have been the best option to arrive at population estimates of certain activities, a longer reference period for each respondent is needed to capture a sufficiently representative set of activities from individuals' activities that can be related to other individual characteristics of the respondent.

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[1] The first wave of HRS was collected in 1992 sampling 51 to 61 year olds and their spouses. Other cohorts were added in subsequent waves of the survey so that beginning with HRS 1998 its sample covers the entire U.S. population age 51 and above.

Also, to capture social interactions a one-day snapshot is not sufficient. Diaries covering a week or more are likely to suffer from lack of compliance over such an extended period and yield low data quality. CAMS adopted a standardized, questionnaire-based format, asking respondents to recall how much time they spent on each of 31 activities. The reference period is either "over the *last week*" for activities that people tend to engage in more frequently, like sleeping, house cleaning, or walking; and for less frequent activities, like volunteer work or attending concerts or movies, the reference period is "over the *last month*." Because the mode is paper and pencil, the respondent can take as much time as needed to retrieve the requested information. This is important: face-to-face or telephone interviews, where the presence of the interviewer tends to limit the amount of time respondents will take to reflect upon their answers, are unlikely to yield reasonable data quality. The advantage of the standardized, self-administered format and its particular implementation is that time-use data could be collected for a fairly large sample, at limited costs, and also respondent burden is contained at a level that can be accommodated in a general-purpose survey, such as the HRS. All three advantages played an important role in the design of the instrument.

The CAMS survey was somewhat experimental at the outset, but, as we show in this paper, data quality appears to be good and descriptive statistics by covariates show very plausible patterns. Combined with the rich information in cross-section and panel that is available for the CAMS respondents, the CAMS data provide a unique resource to address a large set of research questions.

In the next section we discuss the survey design; section 3 presents empirical evidence on data quality; and section 4 provides descriptive statistics of time-use among older populations, illustrating the richness of the HRS data and taking advantage of the large sample size.

2. Survey Instrument

The CAMS questionnaires were sent out in the fall of the respective survey year (2001, 2003, and 2005) to 5,000 respondents in 5,000 households.[2] The sample for CAMS wave 1 was drawn as a random sample of HRS respondents who participated in HRS 2000. CAMS wave 2 was administered to the same households.

The first part of the questionnaire (Section A) asked about time-use of the addressee; the second part (Section B) asked about spending of the household. Even if a household had two HRS respondents (addressee and spouse) time-use information was only collected from one of them, that is, the addressee.[3] Text Box 1 replicates the instructions to the time-use section of the questionnaire and an example of the format in which time spent on activities is elicited: [4]

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[2] Funding has been committed to collect further waves of CAMS in 2007, 2009 and 2011.
[3] CAMS wave 3, which was administered in 2005, included a separate time-use questionnaire for the spouse of the addressee.
[4] A copy of the questionnaires is available at http://hrsonline.isr.umich.edu/meta/2001/cams/qnaire/cams01abc.pdf for the first wave of CAMS, and at http://hrsonline.isr.umich.edu/meta/2003/cams/qnaire/cams2003.pdf for the second wave.

Text Box 1: Survey instructions to respondents and extract of questionnaire

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Section A:

In the first part of this questionnaire section, we ask you to estimate how much time you spent doing various activities during the last week. For each activity, please tell us the number of hours you spent doing that activity. If you haven't done that activity at all in the last week, then mark the "0 hours" box to the right. If you spent less than an hour doing an activity, tell us how much of an hour you did spend (such as ¾ or ½).

PLEASE NOTE:

• Sometimes people do more than one activity at a time -- for example, listening to music while preparing a meal. That is, one hour of listening to music while preparing a meal would count as one hour of listening to music and also one hour of preparing meals.

• Similarly, one behavior might represent more than one activity included in the list. For example, e-mailing friends is both using the computer and communicating with friends. Record that time for both of the activities.

• Please include the time you spent traveling to and from an activity when estimating the amount of time spent on that activity.

• We realize that last week might have been unusual, and that your answers may not reflect your typical activity patterns. It is important, however, to report the actual amount of time spent on each activity, rather than the usual amount.

• If you did not do an activity in the last week, please check the "0 hours" box.

	Hours spent last week		No time spent last week
A1. Watching programs or movies/videos on TV	_____hours last week	**OR**	☐ 0 hours
A2. Reading newspapers or magazines	_____hours last week	**OR**	☐ 0 hours

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Following the format displayed in the text box, respondents were asked about a total of 31 time-use categories in wave 1; wave 2 added two more categories. These cover the following life domains:

- Leisure activities (8 categories),

- Errands and duties around the home (10 categories),

- Exercise (2 categories),

- Socializing (6 categories),

- Working for pay, and

- Other activities (4 categories).

The number of categories in parenthesis indicates the level of detail covered in the questionnaire for each domain (see the Table 1 for further details and wording).

Several elements from the instructions deserve attention from a methodological viewpoint: first, note that the instructions call for double counting of the same hours if respondents engage in more than one activity at the same time and also if respondents consider one and the same activity to fit more than one of the time-use categories provided. This will lead to total hours in activities that could add up to more than there are hours in a day or hours in a month. Both forms of double counting are encouraged as it is not always clear whether an activity represents two activities that could be reported separately, or whether one and the same activity fits two different categories in the questionnaire. For example, cooking with friends could be considered cooking and socializing. The advantage of this method is that it leaves room for respondents to report secondary, tertiary and potentially more activities, even though the *distinction* of primary activities and other activities is not observed by the researcher. At the same time, given the length of the recall period (one week or one month) secondary activities will suffer from higher underreporting than primary activities: while respondents may recall fairly well their main activities over the last week or month when giving it some thought, recalling what other activity they were engaging in at the same time adds another layer of difficulty.

Second, the instructions request information on "last week" or "last month" even if last week or last month was unusual. This may seem at odds with the objective of eliciting usual time-use patterns of the respondent. However, to achieve high data quality in a paper and pencil survey, where there is no opportunity to ask questions to an interviewer, it is important to leave as little room for interpretation as possible about what respondents should report. Also cognitively, the exercise of recalling activities from last week or last month is easier to perform than trying to assess "usual" hours of a certain activity. Even if, for some respondents, last week was not representative, it will simply add noise to the estimates, which can be overcome with a larger sample size.

Finally, notice that the question format does not include an explicit option for "don't know" or "refuse." The rationale for this is to avoid reminding respondents that non-response is a valid option for any single question. Of course, the cover page of the questionnaire stated clearly that respondents could always leave a question blank that they did not want to answer.

A limitation of the experimental design of CAMS waves 1 and 2 is that it only collects time-use information from one person in the household. This limits the extent to which one can study the sharing of tasks within the household, and over time whether certain activities are simply no longer done in the household or whether another household member has taken those over.

3. Data Quality

In this section we present empirical evidence of data quality, such as unit response, item response, time to complete the questionnaire and total hours of activities accounted for in CAMS.

3.1. Unit Response

The raw response rates (i.e., not adjusted for mortality or undeliverable questionnaires) for

CAMS wave 1 and 2 were 77.3 percent and 78 percent, respectively.[5] Because the CAMS

sample was drawn as a random sample from respondents to HRS 2000, we have a lot of

background information on both respondents and non-respondents to the CAMS. Comparison of

the characteristics of the two groups in cross-tabulations shows that response rates differ by age,

self-reported health, education, marital status, race, income and wealth.[6] We therefore apply

weights in the analysis of time-use patterns in the population presented in section 4.

3.2. Item Response Rates and Time to Complete the Questionnaire

As shown in Table 1, item response rates to the time-use questions in CAMS wave 1 were very

high, and even slightly higher in wave 2. All are in the high ninety percent range. The activities

with the lowest response rates, even though they are still in the mid nineties, may have been

considered sensitive to answer by some respondents: "physically showing affection for others

through hugging and kissing," (94.8 and 95.3 in wave 1 and 2), "praying and meditating" (95.3

and 96.2), and "treating or managing an existing medical condition of your own" (95.4 and 95.8).

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[5] In 2003, questionnaires were mailed to 4,156 of the respondents who were sampled in the 2001 CAMS. The
remaining 843 respondents were lost due to death (n=372), loss to follow-up (n=173), and exclusion from the 2003
CAMS because they were participating in other HRS supplemental studies (n=298).

[6] More specifically, in cross-tabulations the age pattern is U-shaped, i.e. younger as well as older addressees are less
likely to respond; response rates show a distinct gradient in self-rated health ranging from 83.1% for those in
excellent health to 62.8% for those in poor health; across education groups response rates are about 80 percent for
all with exception of those with less than high school whose response rate is about 10 percentage points lower; the
response rate among white/Caucasian is 80.2% compared to 64.4% among black/African American; across income
quartiles 71.5% respond in the first quartile, 78.7% in the second and third and 80.5% in the highest income quartile;
wealth quartiles show a similar gradient in response rates ranging from 70.1% in the lowest quartile to 82.4 in the
highest wealth quartile; couples are more likely to return the questionnaire. Their response rate is 81.1 percent
compared to 73.3 percent for singles. This maybe because in a couple there is a chance that the spouse returns the
questionnaire when the addressee is not inclined to. For singles there is no such backup option.

Table 2 shows the distribution of the number of missing items at the individual level by age and education. The first column shows the fraction of full reporters, that is respondents who answered all the time-use questions. Columns two and three show the fraction of respondents with one and two missing values, respectively; the last column shows the fraction with four or more missing values. About 78 percent of the sample answered all categories, and just 4.2 percent had missing values in four or more categories. As one might expect, the fraction of full reporters is greater at younger ages and at higher levels of education.

Data quality is likely to be related to the time the respondent spent filling out the time-use section of the questionnaire. At the end of the time-use section respondents were asked to estimate how long they took to complete that section. Based on these self-reports, average completion time was 15 minutes. Figure 1 shows a histogram of the distribution of the self-reported completion times. The mode was 10 minutes; six percent of wave 1 respondents spent less than 5 minutes; about four percent spent 40 minutes or more. We expect that the relation between completion time and data quality follows an inverse U shape: too short a completion time implies that the person did not really try to remember the activities from last week or the last month; long completion times may indicate difficulties with the task (even though for some it may be extreme conscientiousness). Table 3 provides evidence that this is indeed the case for the CAMS time-use data. It shows the distribution of missing values by categories of time spent to complete the time-use section. The fraction of full reporters first increases with completion time and then decreases.[7] The fraction missing four or more categories is highest for respondents who were particularly fast or particularly slow to complete the survey (10.0 and 11.7 percent,

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[7] For example, there are 73.2 percent full reporters among the group of respondents who took least time (0-4 minutes) to complete the time-use section of the questionnaire; 80.3 percent are full reporters among those who spent 15-19 minutes; and among those who took particularly long there are only 63.6 percent full reporters.

respectively, compared to 2.6 percent among those who took about the average time of 15-19 minutes). Response times also vary by age and education: short response times are more prevalent among younger age groups and respondents with high education are less likely to have extreme completion times, long or short (see Tables 4 and 5).

3.3 Total Hours of Activities Accounted for in CAMS

To compute total hours of recorded activities we need to make categories that are measured in hours "last week" comparable to those measured in hours "last month." We do so by multiplying the categories measured in hours "last week" by 4.3 to arrive at an estimate of hours "last month" for the same categories. Summing over all categories gives the total number of hours recorded over the last month. We consider two scenarios that differ in the treatment of missing values: in the first scenario we set all missing values to zero and report summary statistics for the entire sample. This necessarily leads to an underestimate. However, the resulting bias is quantitatively not very large because the rates of item non-response are so small in CAMS. In the second scenario we show statistics computed only over the sample of full reporters. The results are very similar (see Table 6), so we will focus the discussion on the full sample in Table 6a. The average of total hours is remarkably close to the number of total hours that there are in a month, i.e., 720 hours (30*24=720). For men the total is 681 and for women it is 731. Women report systematically a larger number of hours than men. Note that the survey instrument allows for double counting of hours either as a result of individuals engaging in multiple activities at the same time or as a result of certain activities fitting the description of more than one category asked about in CAMS. Therefore, we expect a wide distribution of hours around the mean, and, indeed, that is the case. For example, the maximum total monthly

hours reported in the survey amounts to 4.4 times the number of hours there are in a month. Of course, some of the hours dispersion could be the result of reporting error. In particular, extreme values tend to be generated when one or more activities reported with the reference period "last week" were entered with an unusually high value. Conversion into a monthly value by multiplying by 4.3 inflates such values by a noticeable factor.   This is an inherent problem of combining items that operate on different time scales.

Overall the distribution of reported hours is fairly symmetric (not shown). The medians are very close to the mean and also other quantiles evidence symmetry. For example at the 25th percentile total hours are the equivalent of about 0.8 months, and 1.2 months at the 75th percentile.

Both for men and women total reported hours decline with age: for men (women) age 50-64 the total amounts to 715 (758) hours per month, while it is 636 (736) for those age 65-74. Among the oldest age group (75+) the total is about the same for men as in the next younger group, but for women the total drops further to 663 hours.

Totals also vary with education. They are lowest for individuals in the lowest education group (602 hours for men, 649 for women), and with a few exceptions they are higher the higher the level of education (714 hours in the highest education group for men, 758 for women in the highest education group).

Table 7 presents the same information, but rather than stating it in total hours per month the totals are expressed in percent of total hours in a month (total hours *100/720).

3.4 Comparison of CAMS Time-Use Data with the American Time-Use Study (ATUS)

Another indicator of data quality is to compare summary statistics from CAMS to outside

data. The only survey that collects comprehensive data on time-use suitable for producing

population estimates that are representative of the U.S. population is the American Time-Use

Study (ATUS), conducted by the Bureau of Labor Statistics (BLS). It was first collected in 2003

which coincides with the second wave of CAMS. The comparison is relevant because the ATUS

has a large sample and the BLS spends considerable effort and resources to enumerate

completely time-use. However, comparisons with the ATUS have limitations because of

differences in sampling, interview mode and whether a diary is used to elicit time-use

information. The sampling frame for the ATUS is the pool of CPS respondents;[8] interviews are

conducted via computer-assisted telephone technology and ATUS uses the diary method.[9] In

contrast CAMS is a random sub-sample from the HRS 2000; it uses a paper and pencil

questionnaire, and it asks respondents to recall how much time they spent on various activities

either last week or last month. These sampling and methodological differences are bound to lead

to some differences in the reported summary statistics. For example, the recall method in CAMS

is expected to result in underestimates, because respondents are likely to forget some incidences

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[8] ATUS is sampled from households who completed their eighth interview with the Current Population Survey (CPS). The unit response rate in 2003 conditional on recruitment from the CPS was about 58 percent which does not take into account non-response to and attrition from the CPS. The combined response rate should be substantially lower. Applying weights restores population representation along some dimensions, but may not be sufficient to correct for potential selection biases in statistics on time-use. About 21,000 individuals aged 15 or over were interviewed in the ATUS 2003, that is, one individual per household chosen at random among those household members age 15 and over.

[9] ATUS uses diaries covering the period from 4 am of the previous day to 4 am of the current day. The diary days were pre-assigned at random prior to the interview to obtain unbiased responses across the different days of the week. Only primary activities are recorded systematically, with the exception of childcare. Respondents' reports on various activities are recoded and assigned a single 6-digit code using the ATUS Coding Lexicon (3-tier coding system of 17 broad activity categories, each with multiple second- and third-tier subcategories; the coding scheme encompasses a total of 438 distinct categories in 2003 ATUS Coding Lexicon). It follows that in ATUS the assignment of activities to specific categories is subject to set-up of the coding scheme and the decisions of the coding personnel. In CAMS respondents decide for themselves how to allocate the activities across the provided categories. CAMS respondents are also encouraged to record secondary activities, even though these cannot be distinguished from primary activities.

of a certain activity over the last week or month. However, CAMS statistics include secondary

activities which should lead to higher levels because ATUS does not include them. Table 8

shows the results for two age groups, by gender, for selected categories, including watching TV;

reading; socializing and communicating; working for pay; telephone, mail and e-mail; personal

care activities; household activities (including purchasing goods and services); leisure and sports;

and caring for and helping non-household members. Overall the summary statistics turn out to

be fairly close to each other. ATUS records somewhat higher totals for time spent watching TV

(except for women age 55-64). The differences are between 1/3 to about one hour per day. Note

that ATUS includes in watching TV also related activities such as borrowing or returning a

movie to the library, for example. The same observation applies to the slightly higher totals for

working, where ATUS includes also many work-related activities. CAMS shows higher totals

for reading by about half an hour and the statistics for telephone, mail and e-mail show more

time spent on this in CAMS as well. Here, the coding scheme in ATUS is likely to give rise to

these differences by assigning various reading activities to other categories and similarly for

various communication activities.[10] For household activities, which we aggregated with

purchasing goods and services, the differences are very small. In summary, we conclude that

the time-use information in CAMS and ATUS are quite closely comparable in spite of the many

methodological differences.

4. Descriptive statistics, by age, education, economic status and health

In this section we turn to analyzing the patterns of time-use in a number of activities. From the

31 activities that were queried in CAMS we construct twelve aggregate categories: leisure,

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[10] For example, reading catalogues, reviewing adds or real estate information would be counted under "purchasing goods and services" while reading in relation to volunteering activities would be assigned to "volunteering." CAMS respondents might well choose to allocated many of these activities to "reading."

errands and housework, working for pay, personal care, exercise, socializing, helping other and volunteering, religious and spiritual activities, time at computer, sleeping, pet care, and managing finances.

4.1 Categories of time-use by age and sex

Table 9 presents the total number of hours per month spent in each of the 12 aggregate categories by age band for males and females. Not surprisingly, working for pay still plays an important role among the 50-64 year olds, and much more so among men than among women. The amount of time spent working drops sharply with age.

On the other hand, errands and housework make up for many more hours among women at all ages. Taking the sum of hours worked for pay and errands and housework, we find that it is the same for men and women aged 50-64, about 180 hours per month. At older ages this sum is higher for women, however, due to the large drop in time spent working for pay among both sexes which is not made up for by the slight increase in housework among men.

A few other patterns are worth pointing out. The time men dedicate to personal care increases sharply with age, and it is about the same as for women at advanced age (75 plus). For women there is no age gradient: the number of hours of personal care remains close to 40 hours at all ages. Women engage in more socializing at all ages, and also in religious activities (meditating, praying and attending religious services), while men spend more time exercising at all ages.

Of course, these averages mask variation by a number of other covariates. In the next two sub-sections we will illustrate this by the examples of education and self-rated health.

4.2 Categories of Time-use by Education as Fraction of Total, excluding Sleep and Work

The set of graphs included in Figure 2 presents the fraction of time spent in various activities other than working and sleeping by age, sex and education. The rationale for excluding the time spent sleeping and working from the denominator is that in this section we are interested in patterns of time-use as a function of total time at individuals' discretion. For example, a respondent who works many hours has necessarily less time to spend socializing or any other activities. Our method adjusts for that.

Several interesting gradients emerge. For example, women with high education spend substantially less time running errands and doing housework than women with low education. Education being a proxy for wealth, the highly educated (and mostly more wealthy) women tend to substitute their own time with market-purchased goods and services. Conversely, the time women spend in leisure activities shows a gradient of the opposite sign; that is, more educated women enjoy a greater fraction of their waking hours in leisure activities. The same is true for helping others and volunteering, and praying, meditating and attending religious services.

Until age 75, men with lower education exercise more than men with high education.[11] We find this surprising because the better educated are in better health, so the "cost" of exercise is lower for them. Furthermore, if exercise is causal for health the higher level of exercise by the less educated should lead to better health.[12] For women there is no discernible pattern of this kind.

Personal care includes as one of its sub-categories "managing a medical condition of your own." Because education is strongly correlated with health, it is not surprising that time spent in

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[11] This pattern is not an artifact of looking at the fraction excluding sleep and work: the total number of hours spent exercising also shows this gradient.
[12] Of course these cross-tabulations do not hold constant other correlates of health and exercise.

15

personal care is much less for those with high education. This strong gradient is, however, less pronounced at advanced age (age 70 and above).

Managing finances among men exhibits a strong positive correlation with age and also a positive education gradient. However, this is not the case for women. At advanced ages, older women are mostly widows who need to take care of their own finances, at least in the absence of help from relatives. Yet, they spend about the same amount of time as younger women who often can rely on their husbands to manage the family's finances. This observation suggests that older women may not be attending adequately to their finances.

4.3 Total hours Spent on Categories of Time-use by Self-rated Health

Table 10 presents descriptive statistics of total hours spent on the various activities by age and self-rated health. The first thing to note is that total hours (sum of all activities) vary substantially by health status and age. For example, individuals in fair or poor health report lower totals by about 90 hours per month than those in excellent and very good health. This could either be due to people in worse health engaging less in simultaneous activities, like ironing while watching TV; or both age and health status are associated with greater difficulties to recall the information. Investigating the various different categories for their association with health we find many of the expected relationships: hours worked for pay are much lower for those in fair or poor health; and so is the time spent exercising. Interestingly, respondents in fair or poor health also systematically sleep less than their healthy counterparts. However, personal care (including treating a medical condition of ones own) and spiritual activities, like praying and meditating, are significantly higher among those in fair or poor health. No such gradients are found in errands/housework, leisure or in socializing.

5. Conclusions

The CAMS time-use section is somewhat experimental as it is aimed at gathering time-use data in a one-shot self-administered questionnaire at low cost. As judged by the very high rate of item response and by the very reasonable patterns of completion times, our assessment of data quality is positive. This conclusion is reinforced by patterns of time-use as a function of age, education and health status in that they accord with prior expectations. For example those in worse health spend more time attending to personal care.

Our comparison of CAMS with ATUS showed similar levels of time-use by category, and similar variation by age. This suggests that for some purposes collection of time-use by recall using a self-administered instrument is a good substitute for a diary method, and it is considerably cheaper. Of course, the CAMS method is no substitute for a diary when the research objective requires high frequency data collection or when it aims to relate time-use to transient states such as affect.

Already the data show a number of interesting results. For example, time spent in managing finances increases with age among men, but not among women. Due to widowing, women become increasingly responsible for their finances with age, so time spent on finances should increase with age. The implication is that they may not be attending adequately to them.

Future work will integrate the time-use data in retirement with economic data, including spending data from CAMS, in studies of household production. Because CAMS is embedded in the rich HRS longitudinal data the time-use data will permit many new types of analyses.

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Table 1: Item-Response Rates in CAMS on Time-Use Variables

Spending Category	Response Rate in percent	
	2001 N=3,866	2003 N=3,254
Leisure Activities		
Watching programs or movies/videos on TV	97.9	97.2
Reading newspapers or magazines	98.0	97.5
Reading books	97.6	96.9
Listening to music	96.1	96.3
Playing cards or games, or solving puzzles	97.4	98.3
Attending concerts, movies, or lectures, or visiting museums	97.3	98.6
Singing or playing a musical instrument	97.4	98.4
Doing arts and crafts projects, including knitting, embroidery, or painting	97.5	98.2
Dining or eating outside the home (not related to business or work)	--	98.3
Errands/duties around the home		
House cleaning	97.2	96.9
Washing, ironing, or mending clothes	98.3	98.2
Yard work or gardening	98.1	97.8
Shopping or running errands	97.7	98.2
Preparing meals and cleaning-up afterwards	97.9	98.1
Personal grooming and hygiene, such as bathing and dressing	98.0	98.1
Caring for pets	97.9	98.1
Treating or managing an existing medical condition of your own	**95.4**	**95.8**
Taking care of finances or investments, such as banking, paying bills, balancing the checkbook, doing taxes, etc.	97.4	98.4
Doing home improvements, including painting, redecorating, or making home repairs	97.3	98.0
Working on, maintaining, or cleaning your car(s) or vehicle(s)	--	98.4
Exercise		
Walking	97.1	96.7
Participating in sports or other exercise activities	97.2	97.4
Socializing		
Visiting in–person with friends, neighbors, or relatives	97.7	97.9
Communicating by telephone, letters, or e-mail with friends, neighbors, or relatives	98.0	98.4
Physically showing affection for others through hugging, kissing, etc.	**94.8**	**95.3**
Helping friends, neighbors, or relatives who did not live with you and did not pay you for the help	97.0	98.2
Attending religious services	97.2	97.9
Attending meetings of clubs or religious groups	96.6	97.8
Working for pay	97.8	98.2
Other		
Using the computer	96.7	97.1
Sleeping and napping (incl. at night)	98.1	97.3
Praying or meditating	**95.3**	**96.2**
Doing volunteer work for religious, educational, health-related, or other charitable organizations	97.1	98.2

Table 2: Distribution of number of missing values by age band and education

	Number of missing values					
	0	1	2	3	4+	All
All	76.2	13.1	3.9	1.5	5.3	100.0
Age category						
50-64	80.8	11.7	3.3	1.1	3.2	100.0
65-74	76.4	13.5	4.0	1.4	4.7	100.0
75+	67.5	15.5	4.8	2.3	9.9	100.0
Education						
less than HS	65.4	17.0	5.9	2.1	9.5	100.0
HS grad or eq.	78.1	12.5	3.5	1.5	4.4	100.0
some college	77.9	13.7	3.5	0.7	4.2	100.0
college +	84.8	9.0	2.1	1.1	3.0	100.0

Table 3: Distribution of number of missing values by time to complete time-use section

Time to complete questionnaire [minutes]	0	1	2	3	4+	All
			Number of missing values			
0-4	73.2	11.8	4.1	0.9	10.0	100.0
5-9	80.3	11.3	3.2	1.0	4.2	100.0
10-14	79.7	13.0	3.3	1.4	2.7	100.0
15-19	80.3	13.3	2.6	1.2	2.6	100.0
20-29	77.3	13.6	4.5	1.7	3.0	100.0
30-59	69.6	16.4	4.3	2.2	7.5	100.0
60+	63.6	15.6	7.8	1.3	11.7	100.0
All	77.7	13.2	3.5	1.4	4.2	100.0

Table 4: Time to complete section on time-use by age band

	Completion time in minutes							
Ageband	0-4	5-9	10-14	15-19	20-29	30-59	60 +	All
50-64	6.6	26.9	29.4	17.3	11.2	7.8	0.9	100.0
65-74	6.9	18.8	27.0	19.2	12.2	13.8	2.1	100.0
75+	2.8	12.3	23.1	20.4	16.6	20.4	4.3	100.0
All	5.8	21.0	27.2	18.6	12.8	12.6	2.1	100.0

Table 5: Time to complete section on time-use by education

	Completion time in minutes							
Education	0-4	5-9	10-14	15-19	20-29	30-59	60 +	All
less than HS	8.2	16.4	23.4	19.3	14.2	15.0	3.6	100.0
HS grad or eq.	5.3	22.2	27.3	18.4	12.2	13.0	1.7	100.0
Some college	5.5	23.1	29.5	17.0	12.2	11.3	1.4	100.0
college +	4.8	22.5	29.1	19.9	12.3	9.8	1.7	100.0
All	5.9	21.1	27.2	18.6	12.7	12.5	2.0	100.0

Table 6: Total hours reported over the last month

a) Total Sample, weighted.

| Sex | Age band | | | |
Education	50-64	65-74	75+	All
Male				
Less than HS	632	558	611	602
HS graduate & equiv.	703	664	630	681
some college	751	630	650	706
college +	738	667	700	714
All	715	636	645	681
Female				
Less than HS	680	642	608	649
HS graduate & equiv.	774	771	682	753
some college	786	747	681	753
college +	768	762	709	758
All	758	736	663	731

b) Full reporters only, weighted.

| Sex | Age band | | | |
Education	50-64	65-74	75+	All
Male				
Less than HS	636	601	629	623
HS graduate & equiv.	701	667	669	688
some college	766	655	661	725
college +	748	681	699	723
All	723	657	665	696
Female				
Less than HS	728	676	637	691
HS graduate & equiv.	801	784	715	779
some college	805	764	711	777
college +	781	765	743	772
All	786	757	697	761

Table 7: Percent of hours in a month reported (reported total hours*100 / 720), weighted.

a) Total Sample, weighted.

Sex	Age band			
Education	50-64	65-74	75+	All
Men				
Less than HS	87.5	77.2	84.6	83.3
HS graduate & equiv.	97.3	91.9	87.2	94.3
some college	103.9	87.2	89.9	97.7
college +	102.2	92.4	97	98.9
All	99	88	89.3	94.3
Women				
Less than HS	94.1	88.9	84.2	89.8
HS graduate & equiv.	107.2	106.8	94.4	104.3
some college	108.8	103.4	94.2	104.3
college +	106.4	105.4	98.1	104.9
All	104.9	101.9	91.8	101.2

b) Full reporters only, weighted.

Sex	Age band			
Education	50-64	65-74	75+	All
Male				
Less than HS	88.0	83.3	87.1	86.3
HS graduate & equiv.	97.1	92.3	92.6	95.2
some college	106.1	90.7	91.6	100.4
college +	103.5	94.3	96.8	100.2
All	100.0	91.0	92.1	96.4
Female				
Less than HS	100.8	93.7	88.3	95.6
HS graduate & equiv.	110.9	108.5	99.0	107.9
some college	111.4	105.8	98.4	107.5
college +	108.2	105.9	102.8	106.9
All	108.8	104.8	96.5	105.4

Table 8: Comparison of CAMS and ATUS 2003 (daily hours)

	CAMS 2003			ATUS 2003		
	Men	Women	Total	Men	Women	Total
Watching TV						
55-64	2.76	2.75	2.76	3.06	2.53	n/a
65+	2.99	3.17	3.11	4.05	3.70	n/a
Reading						
55-64	1.08	1.18	1.14	0.43	0.55	n/a
65+	1.42	1.73	1.63	0.94	1.01	n/a
Socializing and Communicating						
55-64	0.83	1.09	0.98	0.63	0.78	n/a
65+	0.95	1.16	1.09	0.73	0.81	n/a
Working						
55-64	3.57	2.28	2.82	4.64	2.88	3.7
65+	0.87	0.51	0.63	1.20	0.43	0.77
Telephone mail and e-mail						
55-64	0.53	0.83	0.71	0.13	0.28	0.21
65+	0.56	0.85	0.76	0.16	0.36	0.27
Personal care activities						
55-64	8.31	8.61	8.48	8.93	9.31	9.13
65+	8.25	8.51	8.42	9.51	9.76	9.65
Household Activities, *incl. purchasing goods and services*						
55-64	2.47	3.55	3.1	2.47	3.81	3.18
65+	2.74	3.53	3.27	2.79	3.95	3.44
Leisure and Sports						
55-64	6.65	6.26	6.43	5.55	5.02	5.27
65+	7.01	7.27	7.19	7.52	6.88	7.16
Caring for and helping non-household members						
55-64	0.27	0.43	0.37	0.27	0.52	0.4
65+	0.30	0.33	0.32	0.31	0.31	0.31

Source: Authors' calculations for CAMS;
                    U.S. Department of Labor, 2005, for ATUS 2003.

Table 9: CAMS wave 1, average total hours per month, by age category and sex (weighted)

	Men				Women			
	All	50-64	65-74	75+	All	50-64	65-74	75+
Leisure	155.7	148.8	155.5	177.7	171.5	155.9	193.8	178.8
Errands and housework	68.6	65.1	72	74.5	108.4	106.2	117.7	101.3
Personal care	29.6	26.6	30.3	38.1	40.1	39.9	41.8	38.5
Exercise	40.6	39.9	42.1	40.3	28.9	30.3	29.6	25.1
Socializing	52.9	54.3	50.7	52	73.2	71.8	75.3	73.9
Helping others and volunt.	7.6	7.2	8.6	7.7	12.1	13.2	13.2	8.5
Meditating, praying, relig.	14.5	12.5	15.4	19.6	24.3	21.3	28.9	25.2
Computer	20.3	28.4	13	6.5	19.7	31.6	11.5	3.2
Sleep	204.5	203.7	205.1	206.5	194.8	196.4	194.5	191.3
Pet Care	7.1	7.1	8.5	4.7	9.4	10.7	8.2	7.9
Managing finances	4.2	3.4	4	6.9	4	3.9	4.2	3.8
Work for pay	73.3	115.7	29.4	8.3	42.3	74.6	15	3.8
Total	681.2	714.8	636.5	644.6	731	758	736.1	663.4

Table 10: Total hours spent last month on specific activities by self-rated health status, weighted

Activity	Self-rated Health	Ageband 50-64	65-74	75+	All
All activities	exc. or very good	763.3	723.9	678.7	734.8
	Good	743.2	660.5	664.3	696.9
	fair or poor	673.8	670.4	582.6	644.9
	All	737.5	692.3	643.7	701.1
Work	exc. or very good	110.4	26.4	8.4	71.7
	Good	96.7	17.6	4.3	53.0
	fair or poor	39.9	13.3	3.0	22.8
	All	92.7	20.9	5.4	55.2
Errands, housework	exc. or very good	86.4	102.4	97.1	92.5
	Good	88.2	95.4	97.9	92.5
	fair or poor	92.7	97.0	77.6	89.9
	All	88.1	99.1	91.6	91.9
Leisure	exc. or very good	151.4	179.0	181.2	163.6
	Good	154.0	176.8	192.8	169.4
	fair or poor	154.0	178.4	157.9	161.8
	All	152.7	178.2	178.4	164.9
Sleep	exc. or very good	204.2	208.5	198.4	204.5
	Good	198.2	191.4	201.9	197.2
	fair or poor	189.3	188.0	188.8	188.8
	All	199.6	198.8	196.8	198.8
Personal care	exc. or very good	30.1	32.8	34.3	31.5
	Good	32.4	34.9	40.7	35.1
	fair or poor	46.9	49.3	40.6	45.9
	All	34.0	37.1	38.3	35.8
Exercise	exc. or very good	36.7	39.2	35.7	37.2
	Good	35.5	29.0	31.9	32.8
	fair or poor	27.3	32.6	22.8	27.6
	All	34.5	34.7	30.6	33.8
Managing finances	exc. or very good	3.7	4.1	6.7	4.3
	Good	3.8	4.0	4.0	3.9
	fair or poor	3.3	4.3	3.9	3.7
	All	3.7	4.1	4.9	4.0

Using the computer	exc. or very good	38.2	16.0	6.0	27.1
	Good	23.6	8.4	4.2	14.8
	fair or poor	18.1	8.8	2.6	11.4
	All	30.2	12.1	4.4	20.0
Socializing	exc. or very good	63.2	69.6	71.1	66.2
	Good	61.3	61.5	67.9	62.9
	fair or poor	70.5	61.2	57.3	64.4
	All	64.1	65.3	66.0	64.8
Helping others, volunteering	exc. or very good	11.7	12.2	10.1	11.6
	Good	9.3	10.4	9.3	9.6
	fair or poor	9.2	10.7	4.5	8.4
	All	10.5	11.3	8.2	10.3
Praying, meditating, religious services	exc. or very good	15.9	20.5	23.0	18.2
	Good	17.5	21.2	21.1	19.4
	fair or poor	21.7	32.8	25.8	25.8
	All	17.5	23.4	23.2	20.3
Pet care	exc. or very good	9.3	8.3	6.8	8.7
	Good	8.9	8.2	7.0	8.3
	fair or poor	8.8	8.5	6.4	8.1
	All	9.1	8.3	6.7	8.4

Figure 1: histogram of number of minutes respondents took to complete questionnaire
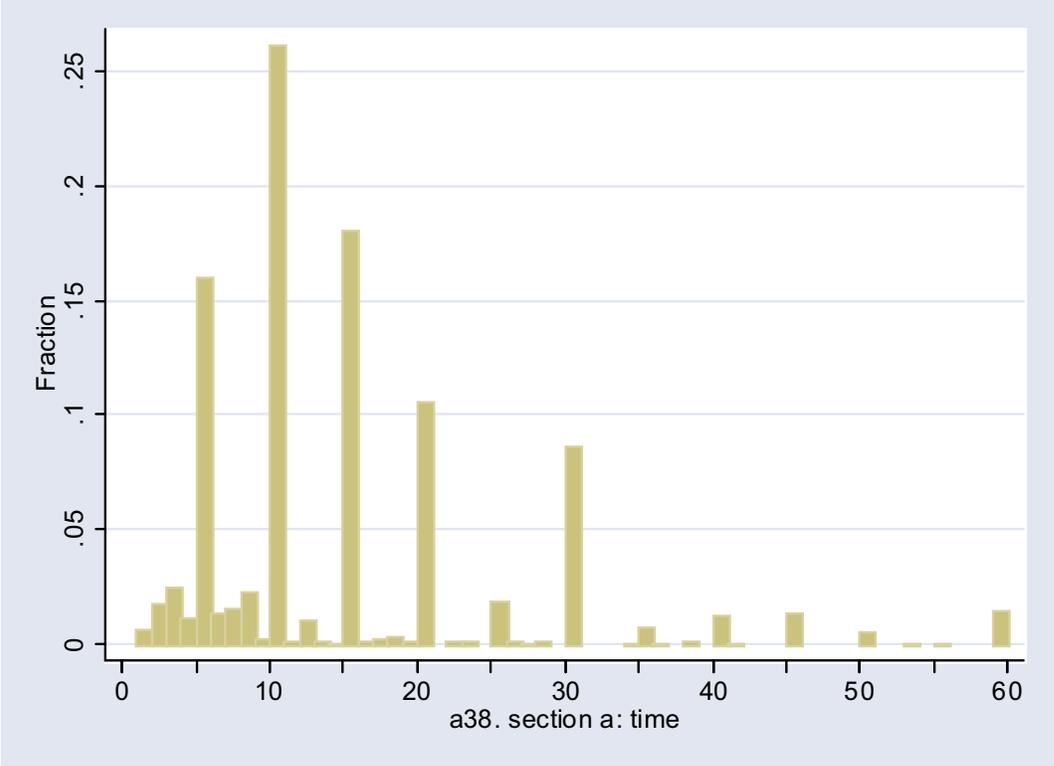
Figure 2: Activities as a fraction of total, excluding sleep and work, by education

Participating in sports, exercising
fraction of total, excluding sleep and work

Personal care
fraction of total, excluding sleep and work

Caring for Pets
fraction of total, excluding sleep and work

Helping others outside the HH, volunteering
fraction of total, excluding sleep and work

Socializing
fraction of total, excluding sleep and work

Praying, meditating, attending religious services
fraction of total, excluding sleep and work

Managing Finances
fraction of total, excluding sleep and work

Using the Computer
fraction of total, excluding sleep and work

33