

## The overestimated workweek revisited

*Data from the American Time Use Survey (ATUS) and a Belgian national survey using weekly diaries indicate that, when asked to estimate their number of work hours, employed respondents tend to overestimate their work hours by 5–10 percent in relation to the work hours they report in their time diaries; most of the overestimation is accounted for by respondents who estimate longer work hours*

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Until recently, most data about the public's time use came from survey questions that ask respondents to estimate how much time they spend or spent on an activity during a particular period, usually a week or day (often "last week" or "yesterday"); an example is "How many hours a week (day) do you spend working (watching television, doing house cleaning, etc.)?" There is a rich body of historical U.S. data that rely solely on this method, which can be called "the time-estimate approach"; in this article, questions asked with this approach generally are referred to as "time-estimate questions" or simply "estimate questions." As examples of the time-estimate approach, the Current Population Survey (CPS) is used to calculate data on time spent working, the Independent Sector (a coalition of charities, corporate giving foundations, and foundations) and other organizations estimate time spent doing volunteer work, the Census Bureau and the U.S. Department of Transportation estimate time spent traveling, and the Roper Organization and the General Social Survey are sources of data on time spent watching television. In *Middletown Families*, Theodore Caplow and colleagues

used the responses to a number of estimate questions to support their arguments about changes in daily life in the United States, and in *Bowling Alone*, Robert Putnam used similar data to support his arguments about declining social capital in the Nation.<sup>1</sup>

The most widely used time estimates of work hours come from the CPS, in which respondents estimate how many hours they worked the previous week as well as estimating the "usual" number of hours per week that they work. The CPS has been considered the premier data source for assessing the extent of and changes in the work patterns of men and women in the United States. One of the great advantages of CPS-type estimate questions is that they are asked of very large samples with high response rates. For example, the CPS surveys about 60,000 households every month for all 12 months of the year regarding work and job-search activities, and these questions have been asked over a very long period, extending back four or more decades. The CPS data thus make it possible to identify not only trends in the overall average number of hours worked, but also trends in hours worked by sex, by age, by marital status, by presence and ages of children, and by other demographics. Juliet Schor, for example, used these data to support her conclusion that Americans are overworked.<sup>2</sup>

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Time-estimate questions have drawbacks, however. Recalling details about time spent in an activity involves complicated calculations. Asking someone "How many hours do you work?" assumes that each respondent interprets "work" the same way, searches his or her memory for *all* episodes of work during an extended period, and is able to properly add up all the lengths of all the episodes across the day or across days in the previous week. Another problem with survey estimate questions is that the respondents are expected to provide on-the-spot answers in a few seconds. What seems at first to be a simple estimation turns out to involve several steps that are quite difficult to perform, even for a respondent with regular and clear work hours and a repetitive daily routine.

An alternative to the time-estimate approach is the time-diary approach. The appeal of time diaries is that respondents are not asked to make complex, vague, or subjective calculations, but simply to recall their activities sequentially for a specific period, usually the previous day. In that way, it becomes possible to reduce the respondents' recall period, to cover all daily activity, and to ensure that the account of one's day respects the "zero-sum" property of time (since the respondents' daily activities must total to exactly 24 hours).

The first U.S. national time-diary studies were conducted at the University of Michigan in 1965 and 1976 and subsequently at the University of Maryland. Since 2003, diaries have been collected by the U.S. Census Bureau for the Bureau of Labor Statistics American Time Use Survey (ATUS), which uses much larger samples of respondents than the earlier studies used. The people in the ATUS sample are age 15 and older and are asked to report all their activities for the previous day. All ATUS respondents are interviewed by telephone.<sup>3</sup>

Despite its usefulness, the diary method is not without its own problems. Respondents can still distort, embellish or even lie outright about what they do. When asked to recall what they did, many simply cannot remember and may substitute a habitual activity for what actually took place. In addition, the method demands a fair amount of time and effort from both the interviewer and the respondent, although survey respondents often enjoy the task of recalling their daily activities.

Analysts might wish for fuller or more verifiable accounts of activity than the oral retrospective diary accounts in the ATUS. Among the alternatives that have been undertaken are "experience sampling method" (ESM) studies, in which respondents report what they are doing when an electronic "beeper" goes off at random moments during the day; the observational approach employed in

the Middletown Media Studies of Ball State University, in which participants are shadowed throughout the day by an observer who digitally records their activity every 10 seconds; and less precise observational approaches, such as those which have been used often in anthropology.<sup>4</sup> Nonetheless, diaries are a richer and more contextualized source of information about people's activities than any present alternative, particularly because of their high response rate and 24-hour-per-day coverage.

### Time estimates versus diary figures

The results from time-diary studies challenge many existing beliefs. Most notably, time-diary-based estimates of paid work hours typically are lower than estimates derived from the CPS.<sup>5</sup> Perhaps because of the diary's implicit constraint on the numbers of hours in a day (all activities must add up to exactly 24 hours), diary respondents tend to report fewer hours at work per day or week than respondents to time-estimate questions. Responding to questions of the type "How many hours do you usually work (or did you work last week)?" workers within the range of 35- to 45-hour work weeks tend to report relatively similar work hours when filling out time diaries and when answering questions asked with the time-estimate approach, but the higher the respondent's estimated number of hours per workweek, the larger is the gap between the estimates obtained with the two approaches. Workers estimating 50- to 80-hour workweeks had progressively greater gaps between this estimate and what they reported in their diaries. This suggests that data obtained from time-estimate questions tend to follow the pattern of "The greater the estimate, the greater the overestimate."

Jerry Jacobs has challenged this notion of inaccurate estimates, arguing that the gap was simply a result of the familiar "regression to the mean" phenomenon. He produced statistical models that could account for these gaps. Using more recent data from the ATUS, Harley Frazis and Jay Stewart found no notable difference between diary data and data from estimate questions, also arguing that any gaps might result from regression to the mean.<sup>6</sup> However, Frazis and Stewart's results were mainly for days in "reference weeks" during the month and not for days in other weeks of the month.

### Previous findings about the gap

In contrast to many previous studies, it is argued here that, in comparing responses to estimate questions about time

spent working with data from time diaries on time spent working, there are several findings from both recent and earlier time-diary research that support the conclusion that the gap between answers to estimate questions and time-diary figures is persistent and consistent (although it does not appear to be especially large) and that respondents tend to give even more inaccurate answers when asked estimate questions about a number of different nonwork daily activities, like housework and sleep.

This section of the article presents arguments and findings from the literature that relate to the gap. Each argument or finding is in italics and is followed by an explanation.

*Estimates across all, or almost all, activities ultimately sum to more than 168 hours per week.* In some studies, respondents have been asked to estimate the durations of virtually all their daily activities, not just work or housework, but sleep, TV, and socializing, among many others. When asked to provide such daily and weekly estimates, survey respondents tend to give estimates that add up to considerably more than the 168 hours in each week. David R. Chase and Geoffrey C. Godbey obtained similar results when they asked members of swimming and tennis clubs how many times they had used the club during the previous 12 months and checked their responses against the sign-in system each club had. For both types of clubs, almost half of all respondents overestimated the actual number of times they participated by more than 100 percent.<sup>7</sup> In other words, there seems to be a tendency for respondents to inflate estimates, either by double counting activities that were done simultaneously or by giving socially desirable responses (as argued later in this article).

*The gap in work hours is found in several other countries.* John Robinson and Jonathan Gershuny found consistent overreporting of paid work hours by employed people, not only in the United States but also in 10 other Western countries. In each country, diary work hours were lower than the number of hours that workers gave in response to estimate questions.<sup>8</sup> The gap was also observed in more recent diary studies conducted in three other countries: Russia, China and Japan.

*The gap was smaller in the 1960s and has varied over time.* John Robinson and Ann Bostrom have noted that the size of the gap was notably smaller in 1965 when the first national diary study was conducted.<sup>9</sup> In 1965, the gap was 1.3 hours; in 1975, 3.6 hours; and in 1985, 6.2 hours. The gap then decreased to 2.7 hours for the 1993–95 period,

increased to 3.7 hours for the 1998–2001 period, and fell to 2.4 hours for the 2003–07 period.

The changing magnitude of the discrepancy since 1965 makes it difficult to argue that the discrepancy simply results from a “regression to the mean” effect, given that there was little evidence of a discrepancy in the earlier studies. It is argued here that, instead, with the movement of the labor force into more service occupations and other occupations in which work schedules are becoming more irregular (with no time clock to punch as a vivid reminder), workers have fewer benchmarks to use in estimating the number of hours in their workweek.

*The gap is in evidence for estimates of work hours arrived at with more precise methods.* Alain Chenu and John Robinson have described a national diary study in France in which workers were asked to complete a “work grid” over a 1-week period, recording for each day the precise times they began and ended work.<sup>10</sup> The grid not only showed work hours that were much closer to diary figures than workers’ standard time estimates were, but also showed the pattern of higher discrepancies among respondents giving higher estimates.

*Even larger overestimates have been found for time spent on housework.* Both a study by Margaret Marini and Beth Shelton and another by Julie E. Press and Eleanor Townsley found notably shorter times spent on various housework tasks, like cooking and cleaning, in national time diaries than in answers to time-estimate questions from the 1984 National Survey of Families and Households (NSFH).<sup>11</sup> The NSFH questions about housework are of particular interest because they deal with unpaid work in society, which is a productive area of daily activity outside of paid work and is of considerable economic relevance, and because they have been extensively analyzed in the family studies literature.

However, both the Marini and Shelton and the Press and Townsley studies had to depend on data from separate time-diary and time-estimate surveys. In the 1998–2001 national diary study described in chapter 2 of *Changing Rhythms of American Family Life*, by Suzanne M. Bianchi, John P. Robinson, and Melissa A. Milkie, both the time-estimate data and daily diary data were collected from the same respondents, making it possible to show that the discrepancy between the two datasets is not a result of confounding factors.<sup>12</sup> Indeed, across each of nine separate household tasks, like cooking and laundry, respondents estimated higher numbers of hours for housework than they reported in their time diaries. After

the time spent doing these nine tasks was added up, it was found that, per week, men estimated a total of 23 hours of housework versus 10 hours in the diary, and women estimated 32 hours versus 17 hours in the diary. Including housework done as a secondary activity (multitasking) in the diary did decrease that gap, but by only 2 hours for men and 3 hours for women. Moreover, the authors found that reducing the time-estimate recall period by changing from a “last week” to a single “yesterday” estimate did not reduce the gap between the estimate and diary figures, even though that “yesterday” was the diary day itself. Furthermore, when the time-estimate data and time-diary data are plotted against each other, the same pattern emerges, with the largest overestimates of housework reported by those estimating the most housework.

*The gap is found in using weekly as well as daily time diaries.* Another way to compare standard estimates with diary figures involves the use of weekly diaries, and this method may be better since here one is using the *same* weekly reference period instead of comparing a day with a week. A study conducted this way thus can move beyond the assumption that daily diary figures can be synthetically aggregated to produce average weekly figures, an assumption that was made in creating work-hour categories for this article. Weekly diaries were used in two studies conducted in Belgium, which are the second main data source for this article; the first source is the ATUS and CPS.

### A hypothesis about the gap

Unlike the case for paid work hours, for which the discrepancy between answers to estimate questions and diary figures is in the 5-percent to 10-percent range, the gap for housework is almost double. This suggests that, although purporting to be measuring the same phenomena, estimate figures and diary figures might better be treated as highly correlated but essentially different from each other. In this article, it is hypothesized that there is not a single “mean” to which to regress, but instead at least two separate means—one for answers to estimate questions and a second for diary figures.

Despite the methodological concerns regarding different wordings of estimate questions—with some asking respondents about “last week,” others about a “usual week,” and so forth—there is evidence in table 1 which suggests that there are in fact two means; specifically, the averages of work hours that respondents estimated are very similar to one another for a given demographic, the diary figures are very similar to one another for a given demographic,

and the gaps between the two datasets are very visible. An answer to a time-estimate question is a *perception* rather than a number arrived at through pure addition, and the perception probably is influenced by implicit or explicit work-hour arrangements between the employer and the employee; in addition, the perception is not formally verified. Moreover, it appears that even more “means” of work hours are introduced by the other observational measures described in the introductory section of this article; for example, “beeper” studies have found notable amounts of time at work being spent on nonwork activities.

### The ATUS and the CPS

The ATUS is a survey of adults age 15 and older that has been conducted across each year since 2003 in the United States with a nationally representative sample. The present study analyzes 2003–07 data from the ATUS and the CPS. Although people ages 15 years and older were interviewed, only those ages 18–64 who were employed are considered here. Between January 1 of 2003 and December 31 of 2007, more than 70,000 adults ages 15 and over were interviewed for the ATUS, with an overall response rate of about 56 percent. The interviews were conducted by telephone by interviewers from the U.S. Census Bureau and were spread across the entire year, with just over 1,500 interviews a month in 2003 and just over 1,000 per month in 2004–07. Approximately half of the interviews asked about weekdays, and the other half asked about (more variable) weekend days.

Each respondent completed a “yesterday diary” for the 24 hours of the previous day, following procedures described in the ATUS section of the BLS Web site. Additionally, the survey includes an estimate question about work hours in addition to demographic and background questions. Other background information and information about works hours had been collected from one randomly chosen member in that household—not necessarily the same respondent—who had been interviewed eight times over the previous 2 years as part of the CPS; the CPS contains two estimate questions about work hours. The ATUS is funded by the Bureau of Labor Statistics and was not specifically designed to be comparable to earlier national time-diary surveys, although it has resulted in diary figures highly similar to those from the earlier surveys.<sup>13</sup>

The diary figures include all activity clearly reported as work in the diary, including short breaks and social events that took place during the workday. Two work-related activities that were not coded as work in these diaries were the commute to and from work and breaks for lunch or

**Table 1. The mean number of hours that respondents directly estimated working, their mean number of work hours according to their diaries, and the difference between the two, 2003–07 data**

Estimate question	1 or more hours			20 or more hours			35 or more hours		
	Estimated	Diary	Estimate minus diary	Estimated	Diary	Estimate minus diary	Estimated	Diary	Estimate minus diary
<b>All workers</b>									
ATUS question about "usual" work hours	39.5	36.3	3.2	41.3	37.4	3.9	44.0	40.4	3.6
CPS question about "usual" work hours	39.5	35.9	3.6	41.3	37.3	4.0	43.5	38.1	5.4
CPS question about work hours "last week"	38.7	35.9	2.8	41.3	37.6	3.7	43.5	40.4	3.1
<b>Women</b>									
ATUS question about "usual" work hours	35.5	32.3	3.2	38.4	34.8	3.6	41.9	37.4	4.5
CPS question about "usual" work hours	36.7	32.1	4.6	39.1	33.9	5.2	42.2	36.2	6.0
CPS question about work hours "last week"	35.5	31.9	3.6	38.7	33.5	5.2	43.9	37.6	6.3
<b>Men</b>									
ATUS question about "usual" work hours	42.7	40.6	2.1	44.2	41.8	2.4	45.8	42.8	3.0
CPS question about "usual" work hours	42.5	40.0	2.5	43.6	40.7	2.9	44.8	41.7	3.1
CPS question about work hours "last week"	42.5	40.0	2.5	43.8	41.3	2.5	46.7	42.8	3.9

NOTE: The diary data differ within a given column and demographic because the diaries are matched with the people who answered the respective estimate questions (the ATUS estimate question and the two

from the CPS) so as to calculate reliable "estimate minus diary" figures.

SOURCES: The American Time Use Survey and the Current Population Survey.

other meals. In order to generate synthetic weekly estimates from these daily diaries, data for each day were aggregated. Thus, if respondents averaged 7 hours of paid work as recorded in the diary for Monday, 8 hours as recorded for Tuesday through Thursday, 6 hours for Friday, 3 hours for Saturday, and 0 hour for Sunday, the aggregated weekly diary time for this sample would be  $(7 + 8 + 8 + 8 + 6 + 3 + 0 =) 40$  hours.

Three estimate questions (each composed of two sub-questions) are asked about work hours, one question asked in the ATUS and the other two asked in the CPS. The ATUS asks the following:

- 1) a) How many hours do you usually work per week at your main job? and b) How many hours do you usually work per week at your other jobs?

The other two questions are the ones the original household respondent had answered for all employed house-

hold members in the CPS interview 2–5 months previous to the ATUS survey. One question is the same as the one asked in the ATUS:

- 2) a) How many hours do you usually work per week at your main job? and b) How many hours do you usually work per week at your other jobs?

The other question in the CPS interview was in regard to each worker's actual work hours from the previous week:

- 3) Last week, how many hours did you actually work at your main job? and b) Last week, how many hours did you actually work at your other jobs?

Note that all these questions include second jobs in the total, as do the diary figures for all working people.

The mean values for the responses to each of these three estimate questions appear in table 1 alongside the

mean work hours that were calculated from the diary for the same groups of people that answered the respective estimate questions. The diary figures were weighted such that equal weight is given to each day of the week.

### ATUS and CPS results

As can be seen in table 1, the three questions presented in the previous section of this article resulted in remarkably similar mean estimates. The hours worked as calculated from the diary are in another column, and the differences between the data in these two columns are shown in the third column. These three columns exist across the three categories of workers in the table. In order to show that the gap between the work hours given in response to estimate questions and the work hours calculated from diaries applies both to workers with heavier workweeks and to those with lighter workweeks, data are provided for three categories of workers: 1) those estimating 1 or more hours of work per week, 2) those estimating 20 or more hours of work a week, and 3) those estimating 35 or more hours of work a week. In addition, the data are calculated for all workers together and also calculated separately for female and male workers.

It can be seen that, for both the questions about usual work hours and the question about work hours from the previous week, and for both female and male workers, the estimates are larger than the diary figures, as hypothesized and as found in previous studies. That gap tends to be larger for full-time workers than for full-time and part-time workers together, and larger for women than men. The gap between the answers to the CPS question on actual hours and the diary data is lower than both of the other gaps for men and women together, but not lower than both for men and women separately. The “estimate–diary” gaps range from 2.1 hours to 6.3 hours; in other words, relative to the work hours they recorded in their diaries, when asked how many hours they usually worked or had worked the previous week, people overestimated by between 5 percent and 12 percent.

Averaged across all years, estimated works hours come to over 39 hours of work per week, whereas the diary figures averaged closer to 36 hours. Chart 1 shows the gap as a function of the estimated number of hours worked for each of the three estimate questions. The chart shows the familiar “greater estimate, greater overestimate” pattern from previous gap studies. As might be expected, compared with the diary figures, the responses to the CPS question about work hours during the prior week differed the least, and the responses to the CPS question about

usual hours (asked 2–5 months previously) differed the most, with the responses to the ATUS question about usual work hours in between. Nonetheless, the three lines on the chart are remarkably close and similar to one other.

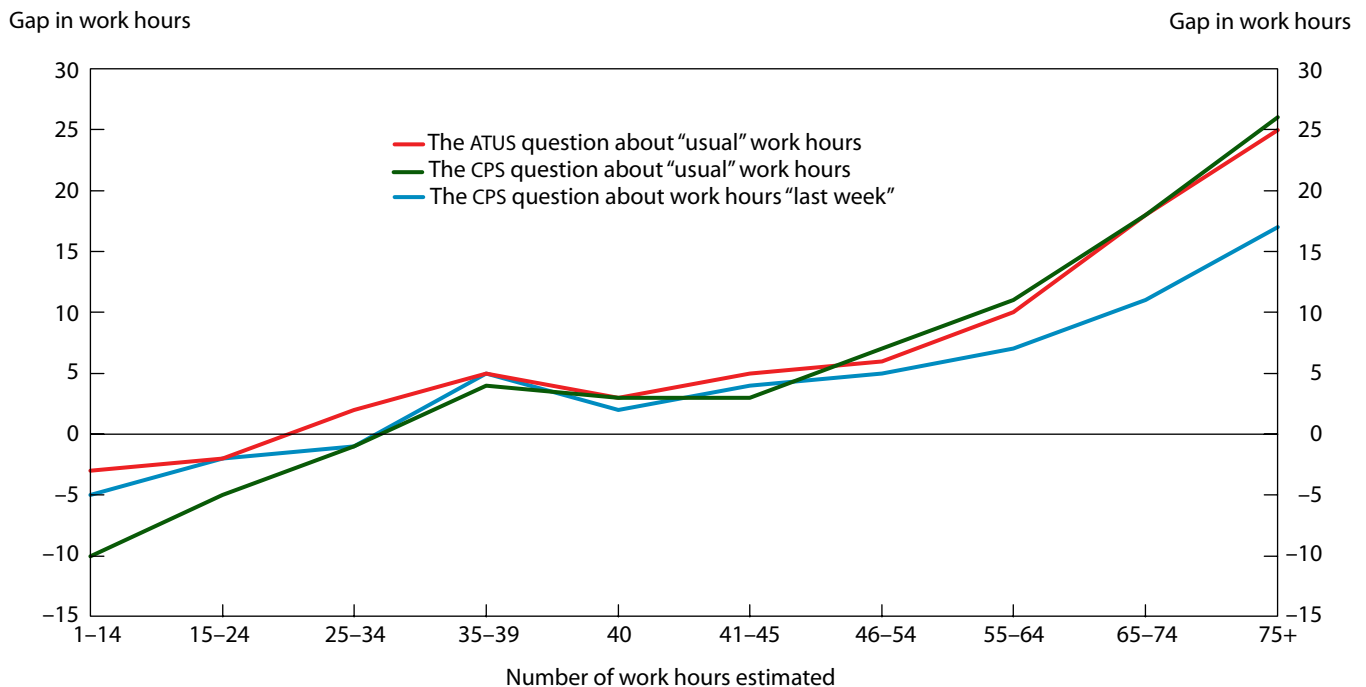
If chart 1 were also to show these gaps by sex, the general pattern would hold both for women and for men, although for both sexes the gap is not as marked as in most previous studies. Note that the same “greater estimate, greater overestimate” pattern in chart 1 holds after multivariate adjustment for each respondent’s age, education, marital status and parental status.

### Weekly time diary studies in Belgium

National time-diary data were gathered in Flanders, the Dutch-speaking part of northern Belgium in 1999 and in 2004 by data collectors who visited people’s homes. Respondents were selected randomly from the government’s General Register (containing all Belgians) in 1999 and from a commercial mailing list (claiming to contain more than 95 percent of Belgians) in 2004. A total of 1,533 respondents ages 16 to 75 years took part in the 1999 study, and a total of 1,780 respondents ages 18 to 75 years participated in the 2004 study. In both studies the field work took place between mid-April and mid-July and from the first of September to the end of October. The response rate in 1999 was about 27 percent; in 2004, it was approximately 37 percent. After adjustments for invalid addresses, deceased persons, those who did not speak Dutch, those who were sick, people who were handicapped in a way that prevented them from responding, and those who were on vacation or business travel during the period, the response rates increased to 29 percent for the 1999 study and to 42 percent for the 2004 study. Although these response rates are low, they are higher than one might have expected given that the survey involved a fairly high level of respondent burden. In addition, both datasets were weighted for educational level, sex, and age to be in accordance with national demographic figures. The diary weeks and the starting days were both assigned randomly across respondents. For this article, the data from the two studies were pooled. Only people ages 18 to 64 years old who had a job were selected ( $n = 1,796$ : 977 men and 819 women).

Respondents were contacted in person. After instructions from the interviewers on how to record their activities, respondents filled out a multipage diary for the next 7 consecutive days, describing on each page their main activities with the starting and ending times for each activity, and also writing down secondary activities occurring simultaneously, the location of each activity, any means of

**Chart 1. The mean number of work hours directly estimated by respondents in the ATUS and CPS minus the mean number of work hours as calculated from ATUS time diaries, 2003–07 data**



SOURCES: The American Time Use Survey and the Current Population Survey.

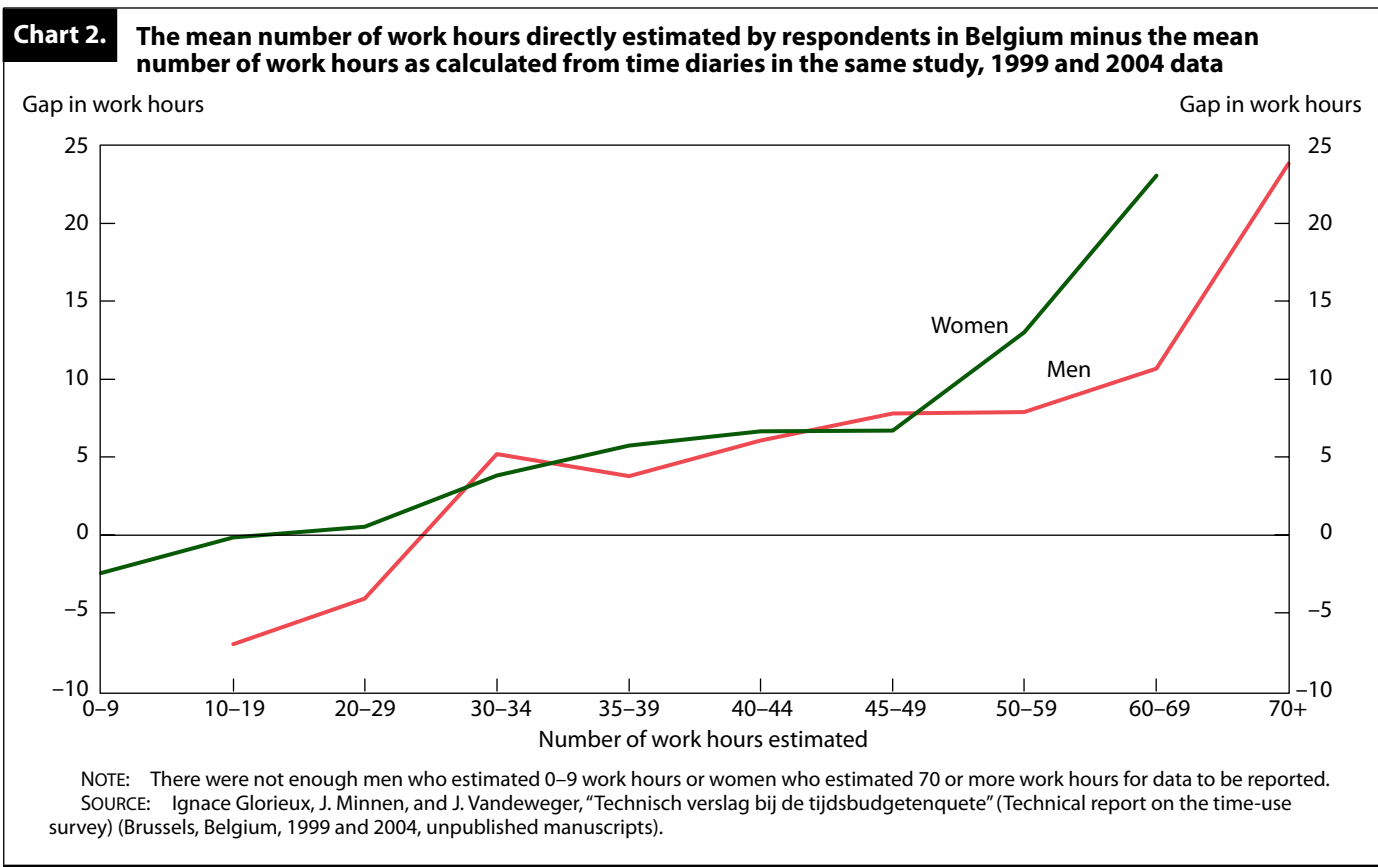
transport taken during the activity, and the people whom they were with while doing all activities. The respondents were instructed to carry the diary with them throughout the day. It was an open-interval diary, meaning that respondents could report exact starting and ending times. To record their main and secondary activities, they were instructed to refer to a list of 163 activities (154 in 1999) that had been created with the intent to cover all relevant human activity. If respondents felt that one or more of their activities were not on the list, they could write it out in their own words. The use of a precoded activity list has the advantage of steering respondents toward employing the same level of detail in reporting their activities.

The diary information was supplemented in both surveys by two questionnaires. The first was administered face-to-face before the diary period and contained mainly questions on sociodemographic factors, attitudes, and other background information, as well as instructions for filling out the diary correctly. The first questionnaire asked the following question on work hours: “How many hours do you generally spend per week (weekend included) on paid work? By work we mean all the work you do for your main job, including paid and unpaid overtime. Thus, it is

the real time you work on your main job. Please do not include the time you travel between home and work.”

The question has the advantage over the aforementioned CPS questions of asking respondents to exclude their work commute. Respondents were not explicitly asked to exclude meal times. However, since the preceding question asked about the number of hours that respondents were contracted to work, it should have been clear to the respondents not to take meal times into account. Nevertheless, this ambiguity could be a factor behind the discrepancies between diary times and people’s responses to the estimate question about work hours. The estimate question was repeated for those respondents with a second job. These two estimates (one for the first job, the other for the second) were counted together to arrive at one estimate of the total amount of time spent on paid work per week. This general estimate was then coded into 1 of the 10 work-hour categories shown in chart 2.

During the second visit to the respondent, the interviewer checked over the diary with the respondent to resolve any problems or ambiguities in the diary before collecting it. The interviewer also conducted the second questionnaire, which asked whether respondents had dif-



faculties managing their time and also asked about the division of labor within the household.<sup>14</sup>

The advantage of these Belgian data over the ATUS diary data is that they cover an entire week of activities for each individual rather than a single day. Moreover, the estimate question in the Belgian survey asks about general work hours to provide a firm benchmark against which to compare actual work hours as reported in the diary, rather than asking for a “last week” (actual) estimate that may not have been typical.

### Results from the Belgian studies

Chart 2 displays data from the Belgian studies and is similar to chart 1 in that it measures estimated work hours on the *x*-axis and the difference between estimated hours and diary hours on the *y*-axis. It can be seen that chart 2 conforms to the “greater estimate, greater overestimate” pattern in chart 1 and in previous studies. Perhaps not surprisingly, people who worked “normal hours” (in the 30- to 49-hour range) overestimated their work hours by the smallest amount. As in chart 1 and earlier studies, respondents working less than 30 hours were found

to underestimate their work hours relative to the hours reported in their diaries, counter to the pattern for those working 50 or more hours found in these and other studies. (In the Belgian studies, the overestimate begins even before the 40- to 44-hour range.) In these Belgian studies and a number of others, women, on the whole, seem to overestimate time spent at work more than men do; this is especially true among people who estimate working 50 hours or more. For the sample as a whole, there is a clear general tendency for the estimated number of work hours to be larger than the number calculated from the weekly diary, which is consistent with the hypothesis that there are “diary means” and “estimate means” and that one should not expect a one-to-one correspondence between the two.

### Possible reasons for the gap

As noted earlier, there may still be ambiguities in survey questions that underlie gaps between people’s responses to estimate questions and the hours they report in time diaries. The possibility that respondents might include their time spent commuting or on their lunch breaks



in their estimates of work hours was minimized in the Belgian survey, but the possibility still exists. Moreover, it is also possible that workers fail to subtract time lost to household crises or other sudden nonwork demands (such as the need to take care of a sick child or repair one's car).

Another factor behind the aforementioned gap may be the well-known survey phenomenon of social desirability.<sup>15</sup> Respondents may believe that low estimates of time spent on paid work or housework estimates could be taken as a sign of being lazy or irresponsible. It seems that the effect of social desirability is a factor behind the discrepancies shown in chapter 2 of *Changing Rhythms of American Family Life* between respondents' estimates of time spent on housework and parallel diary figures. In the ATUS and CPS results calculated for this article, however, the gaps for paid work and housework—approximately 2–3 hours a week for paid work and 10–15 hours a week for housework and family care—are much smaller, both in relative and absolute terms. The housework estimates are almost double the corresponding diary figures, whereas respondents' estimates of paid work hours average 5–10 percent higher than the hours figures calculated from their diaries. (The housework diary figures in *Changing Rhythms* were quite close to those reported in the 2003–07 ATUS diaries.)

There are, as might be expected, several other reasons for the lower overestimates of paid work compared with the overestimates of housework. Paid work hours are far more regularized and often have fixed schedules, with coworkers and supervisors monitoring and depending on reciprocal work activity. When people do unpaid work at home, new home appliances often make it possible to multitask (for example, by doing childcare and other tasks as the washing machine is running); thus, many housework activities become blended together, making it virtually impossible to get an accurate count of hours spent without videotaping the people in the sample or having an observer record their activities.

The misestimation of time in a socially desirable direction seems to carry over to other activities as well, such as attendance at religious services and volunteering. Respondents overestimated their time at religious services by almost 50 percent—1.5 estimated weekly hours, compared with about 1.0 hour in the ATUS diaries. As with other examples of overestimation, there could be simple explanations for such a pattern: people arriving late or leaving early from services, people counting socializing after a service as time at the service, people including driving time, etc. However, the social desirability explanation does seem to fit this overestimation of time, given that religion

is, for the most part, a highly valued activity in American society. Religious services usually have clear start and end times and a regularized agenda, which might help explain why the overestimation for religious services is lower than that for volunteering, in which respondents report engaging for an average of 2 hours a week, compared with the mean weekly ATUS diary figure of about 1 hour.

The social desirability argument also fits with two other activities for which respondents *underestimate* their weekly hours spent relative to the diary, namely, sleep and free time. Since the first diary study in 1965, respondents have consistently reported somewhere around 8 hours of sleep in their diaries (and closer to 8.5 hours a day in ATUS), yet several surveys contain estimates of closer to 7 hours.<sup>16</sup> And when asked to estimate how many hours of free time they have per week (with an accompanying definition of the seven most common types of free time, including watching TV and socializing), respondents report less than 20 hours per week, compared with at least 35 hours in the ATUS diary.

An argument different from that of social desirability would be needed to explain the underestimation of work hours by those with shorter workweeks and the unemployed. It was anecdotally reported that, in one study of workers classified as unemployed (from lists of such workers), when interviews ran longer than expected, several of these “unemployed” interviewees broke off the interview by saying, in effect, “I’m sorry, but I have to go to work.” These workers either still considered themselves unemployed (possibly because they were underemployed) or did not take fully into account the hours they were putting in, perhaps because their work schedule was irregular or unpredictable.

Time estimates are not invariably overestimates. However, for more “productive” activities, it appears the estimates are subject to the common survey issue of social desirability, although far more for unpaid housework than for paid work.

THIS ARTICLE HAS COMPARED DATA from time diaries on the number of hours people worked with data gathered from employed respondents who were asked to estimate directly the number of hours they usually work or actually worked. Results suggest that, overall, the “estimate questions” generate higher estimates of the time men and women spend doing paid work than do figures from daily diaries that are extrapolated across the week. Moreover, there is consistent evidence that larger discrepancies tend to arise from respondents who estimate more hours in their workweek. In *Changing Rhythms of American Family*

*Life*, there was little indication that reducing the estimate timeframe from a week to a day decreased the gap between the estimates respondents gave and the work hours they reported in their time diaries, providing further evidence that data on work hours obtained from estimate questions ought to be treated as a different concept or variable than the figures generated obtained from diaries.

These estimate–diary comparisons are consistent with earlier U.S. diary studies and those from several other countries in that they show minor overestimates of hours spent at work, mainly due to workers who estimate the greatest (60 or more) number of hours at work. This difference in the accuracy of estimates between people who work more hours and those who work fewer hours may be due to those estimating longer workweeks (and the diaries confirm that they *do* work longer hours than those giving lower estimates) feeling overworked during hours when other workers are enjoying their time off from work.

These hypotheses for why some groups seem to estimate work time more accurately than others could be supported by follow-up questions that ask respondents if they had to take off any time from work during the “diary day” for personal reasons. Another potential avenue for research would be to identify workers in the ATUS data who have service jobs or other jobs that allow nonwork activities as an official part of the workday and to compare their work hours with workers whose jobs do not allow nonwork activities as part of the workday.

Another approach would involve a panel study design and weekly diaries. Workers would first be asked to estimate their work hours for the upcoming week. They would then be asked to fill out a diary for each of the next 7 days. When the interviewer returns to collect the week’s worth of diary entries, the interviewer would ask the respondent to estimate how many hours he or she worked over the previous 7 days and then compare those answers with the hours in the weekly diary. The study would be strengthened by other methods of estimating the workweek, such as the “work grid” described in Chenu and Robinson’s article.<sup>17</sup>

Ultimately, however, there will be a need to employ more intensive and verifiable methods, presumably employing some method of direct observation. Currently, work activity is something of a “black box,” in that researchers must depend on respondents’ self-reported accounts of work. When diary respondents say that they were working during a given part of the workday, even if that time was spent purely on socializing or recreation having no relevance to work, it is counted as work time. Thus, some unknown percentage of the reports of “work” in diaries include time spent using the Internet or telephone for personal matters, having water-cooler discussions, daydreaming, and doing dozens of other nonwork activities. Until some form of “beeper” or on-site observation study focused on work hours is conducted, however, the factors behind the gap between respondents’ estimates and their diary entries remain open to speculation. □

## Notes

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<sup>1</sup> Theodore Caplow, Bruce A. Chadwick, Howard M. Bahr, and Reuben Hill, *Middletown Families: Fifty Years of Change and Continuity* (Minneapolis, MN, University of Minnesota Press, 1982); and Robert Putnam, *Bowling Alone: The Collapse and Revival of American Community* (New York, Simon & Schuster, Ltd., 2001).

<sup>2</sup> Juliet B. Schor, *The Overworked American: The Unexpected Decline of Leisure* (New York, NY, Basic Books, 1992).

<sup>3</sup> See <http://www.bls.gov/tus> (visited May 27, 2011) for more information about the ATUS. In addition, see Katherine G. Abraham, Aaron Maitland, and Suzanne M. Bianchi, “Nonresponse in the American Time Use Survey: Who Is Missing from the Data and How Much Does It Matter?” *Public Opinion Quarterly*, 2006, vol. 70, no. 5, pp. 676–703. More general reviews of the diary method can be found in William Michelson, *Time Use: Expanding Explanation in the Social*

*Sciences* (Boulder, Colorado: Paradigm Press, 2005); Jonathan Gershuny, *Changing Times: Work and Leisure in Postindustrial Society* (Oxford, England, Oxford University Press, 2000); and John P. Robinson and Geoffrey Godbey, *Time for Life: The Surprising Ways Americans Use Their Time* (University Park, PA, Pennsylvania State University Press, 1999). In these sources, evidence is provided to support the basic reliability and validity of the diary method. That is, the accounts of work time from different diary studies tend to be fairly similar both with one another and with data on work hours collected in a number of other ways, such as direct observation (e.g., studies in which respondents are observed directly and studies in which respondents report their activity at random moments during the day when a beeper goes off).

<sup>4</sup> See Mihaly Csikszentmihalyi, *Flow: The Psychology of Optimal Experience* (New York, NY, HarperCollins, 1990); and Michael Holmes and Mike Bloxham, “An Observational Method for Time Use Research: Lessons Learned from the Middletown Media Studies,” *Social Indicators Research*, August 2009, pp. 245–48.

<sup>5</sup> See John P. Robinson and Ann Bostrom, “The overestimated workweek? What time diary measures suggest,” *Monthly Labor Review*, August 1994, pp. 11–23; and John Robinson and Jonathan Gershuny,

“Measuring Hours of Paid Work: Time-Diary vs Estimate Questions” *Bulletin of Labour Statistics*, 1994, pp. 11–17.

<sup>6</sup> Jerry A. Jacobs, “Measuring time at work: are self-reports accurate?” *Monthly Labor Review*, December 1998, pp. 42–53; and Harley Frazis and Jay Stewart, “What can time-use data tell us about hours of work?” *Monthly Labor Review*, December 2004, pp. 3–9.

<sup>7</sup> See Douglass K. Hawes, W. Wayne Talarzyk, and Roger D. Blackwell, “Consumer Satisfaction from Leisure Time Pursuits,” in Mary Jane Schlinger, ed., *Advances in Consumer Research* (Chicago, Association for Consumer Research, 1975), pp. 817–36; Lois Verbrugge and Ann Gruber-Baldini, *Baltimore Study of Activity Patterns* (Ann Arbor, Institute of Gerontology, University of Michigan, 1993); and David Chase and Geoffrey C. Godbey, “Accuracy of Self-Reported Participation Rates: Research Notes,” *Leisure Studies*, issue 2, 1983, pp. 231–35.

<sup>8</sup> Robinson and Gershuny, “Measuring Hours of Paid Work.”

<sup>9</sup> Robinson and Bostrom, “The overestimated workweek?”

<sup>10</sup> Alain Chenu and John P. Robinson, “Synchronicity in the work schedules of working couples,” *Monthly Labor Review*, April 2002, pp. 55–63.

<sup>11</sup> Margaret Marini and Beth Shelton, “Measuring Household Work: Recent Experience in the United States,” *Social Science Research*, December 1993, pp. 361–82; and Julie E. Press and Eleanor Townsley, “Wives’ and Husbands’ Housework reporting: Gender, Class and Social Desirability,” *Gender and Society*, April 1998, pp. 188–218.

<sup>12</sup> Suzanne M. Bianchi, John P. Robinson, and Melissa A. Milkie,

*Changing Rhythms of American Family Life*, (New York, Russell Sage Foundation, 2006).

<sup>13</sup> Mark Aguiar and Erik Hurst, “A Summary of Trends in American Time Allocation: 1965–2005,” *Social Indicators Research*, August 2009, pp. 57–64; and Kimberly Fisher, Muriel Egerton, Jonathan I. Gershuny, and John P. Robinson, “Gender Convergence in the American Heritage Time Use Study,” *Social Indicators Research*, May 2007, pp. 1–33.

<sup>14</sup> More details on the field procedures used in this study can be found in Ignace Glorieux, Joeri Minnen, and Jessie Vandeweyer *Technisch verslag bij de tijdsbudgetenquete* (Technical report on the time-use survey (Vrije Universiteit Brussel, Brussels, Belgium, 2005); and Ignace Glorieux, S. Koelet and M. Moens, *Technisch verslag bij de tijdsbudgetenquete* (Vrije Universiteit Brussel, Brussels, Belgium, 2000). Both of these reports are unpublished.

<sup>15</sup> Jon Krosnick, “Maximizing Questionnaire Quality,” in John P. Robinson, Phillip R. Shaver, and Lawrence S. Wrightsman, eds., *Measures of Political Attitudes* (San Diego, CA, Academic Press, 1998), pp. 35–55; and Seymour Sudman and Norman M. Bradburn, *Asking Questions: A Practical Guide to Questionnaire Design* (San Francisco, CA, Jossey-Bass, 1983).

<sup>16</sup> *National Sleep Foundation Bedroom Poll: Summary of Findings*, [http://www.sleepfoundation.org/sites/default/files/bedroompoll/NSF\\_Bedroom\\_Poll\\_Report.pdf](http://www.sleepfoundation.org/sites/default/files/bedroompoll/NSF_Bedroom_Poll_Report.pdf) (visited June 22, 2011).

<sup>17</sup> Chenu and Robinson, “Synchronicity in the work schedules of working couples.”