Measuring time at work: are self-reports accurate?

A new measure of work time correlates well with the standard self-reported workweek method; however, a closer look reveals that reference periods— last week, versus last year—do have an impact on some workers in the distribution

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Are Americans working more than they have in decades? Does the answer depend upon how one measures an individual's time at work? Since the publication of Juliet Schor's best-selling book, *The Overworked American*, questions regarding the amount of time workers devote to their jobs have received considerable attention.[1] Interest in the length of the workweek is related to important shifts in the demography of the labor force. In particular, the rise of dual earner families has left many individuals feeling pressed for time.[2] The "time famine" faced by working parents has generated much research and public discussion.[3]

John P. Robinson and his colleagues have carefully collected and analyzed time diary data from nationally representative samples of respondents since the 1960s. This research effort has produced many interesting and important findings regarding how American's use their time.[4] Based on their analyses of time diary data, Robinson and Ann Bostrom raised questions about the accuracy of the standard self-reported measure of working time. They suggest that respondents who claim to work long hours exaggerate the amount of time they spend on the job, compared with the time-diary measure. This finding challenges claims that have been made about trends in the time Americans spend on the job. For example, Philip L. Rones and others conclude that the proportion of Americans who work more than 50 hours per week has increased since 1970, based on analysis of data from the Current Population Survey (CPS).[5] If self-

reported working time is exaggerated, then this conclusion becomes suspect. Claims of a general increase in working time would also be called into question if workers exaggerate their time on the job.[6]

Measures of working time are also important because they are instrumental in computing hourly wage rates. Due to the fact that many of the individuals reporting long hours on the job are workers with college degrees who earn high incomes, exaggeration of work hours among this group would increase estimates of the extent of inequality in the labor market.[7]

This article examines the accuracy of self-reported measures of working time raised by John Robinson and Ann Bostrom in four ways. First, it re-examines the issue of time inflation by offering a new interpretation of Robinson and Bostrom's results. Second, it investigates a new measure of the workweek, derived from departure and return times, and compares it to the results obtained with conventional self-reports. Third, it searches for factors that might produce bias and error in self-reports. And, fourth, this article considers the effect of differences across reference periods (last week versus last year) based on data from the CPS.

Exaggerated workweek?

The Current Population Survey, administered monthly, asks respondents: "What was _____ doing most of last week?" and then "How many

hours did _____ work last week at all jobs?" Individuals' own estimates of their time spent on the job form the basis of this data series on working time.[8]

There are good reasons to be skeptical of individuals' self-reports of their time at work. As John Robinson and Geoffrey Godbey point out, "People think they know how many hours they work––that is, until they actually try to figure it out."[9] They suggest a number of reasons for miscalculations: respondents have to calculate their workweek in a few seconds; respondents might provide normatively desirable answers rather than precise information; and ambiguities in what constitutes work (commuting time, lunch breaks, work brought home) may lead to error in reporting. There are also good reasons to suspect that the exaggeration of working time has become more acute in recent years, as many workers in dual-earner families feel squeezed for time. In addition, if work is increasing in intensity, workers might mistakenly report this as an increase in the duration of work.

One approach to assessing the accuracy of data on working time is to compare individual self-reports with information from company records. Willard L. Rodgers and others report a moderately strong correlation (r = 0.614) between self-reports and company records regarding hours worked "last week."[10] They find a higher association when company and self-reports of annual hours are compared (r = 0.719). They also find no evidence that workers exaggerate their working time. Their results offer a basis for confidence in the standard self-reports of working time, at least for cross-sectional analyses. However, their sample of workers in one manufacturing company—most of whom were full-time, unionized workers—might not apply to the labor force as a whole.

Robinson and his colleagues take time diaries to be the gold standard of time measurement, and find other estimates of time use wanting.[11] To compare the two approaches using the same sample, Robinson and others ask a group of respondents to fill out time diaries as well as the standard self-reported question regarding time on the job. They find that respondents who report working long hours (50 or more hours per week) tend to exaggerate the time they spend at work, at least compared with time-diary measures which the researchers believe are more accurate. They also find that the extent of this exaggeration increased between the 1960s and 1980s.

The discrepancy between self-reported and time-diary measures of working time may instead be a statistical artifact. Robinson and Bostrom report that individuals working few hours underreport their time on the job, while those working long hours exaggerate their working time. This could result from regression to the mean: if two measures are strongly related, but with significant measurement error, the pattern reported by Robinson and Bostrom will be observed simply as a function of the fact that the random errors at the top of the distribution will tend to deflate the highest scores, and random errors at the bottom of the distribution will tend to inflate the lowest scores. Evidence presented later suggests that workweeks are entirely consistent with this "regression to the mean" explanation. That will be the first theme of this analysis.

Robinson and his colleagues maintain that time-diary measures are an attractive alternative to the standard self-reported estimate of working time. Although there is much to be gleaned from time diaries, they represent an extremely data-intensive research strategy. Moreover, they do not readily provide answers to some important questions about the labor force. For example, with a standard daily diary, a researcher cannot assess the length of the workweek for a given individual or a married couple. Instead, one must add the weekdays and weekends of different individuals to create a synthetic workweek.[12] Thus, for many purposes, such as translating weekly earnings into hourly wage rates, a daily time diary will not suffice.

While time diaries provide more detailed data on time utilization than do standard self-reported questions, an even more detailed approach to time use is the Experience Sampling Method. For this survey, respondents are required to wear digital wristwatches that beep randomly for them to record their activity several times over a 1-week period.[13] Advocates maintain that this method avoids the recall problems of time diaries and thus provides more precise information about time use. To date, the Experience Sampling Method has been employed to measure adolescent students' use of, and evaluation of, their time.[14] It remains to be seen how appropriate this methodology will be for adults' use of time, including time on the job.

Departures and returns

It would be desirable to develop simple measures of working time that can serve as a check on the accuracy of self-reports, and, if necessary, as a substitute for them. Eliciting from respondents the time they typically leave their homes for work and the time they typically return home from work is one such possibility.[15]

Workers have good reason to remember the times at which they leave for and return from work. Some workers have to arrive at work by an appointed time, such as 9 AM. Many others listen to the radio or television while preparing to leave for work, and might note the current time mentioned by announcers or shown in the corner of the television screen. (Television shows organized into half-hour time blocks make it easy to estimate departure and return times to within 30-minute accuracy.) Workers commuting by train sometimes have to arrive at the station at a designated time to catch a particular train. As a cognitive task, then, it might be easier

for respondents to specify their departure and return times than it is to estimate the amount of time they spend on the job.

One could then use departure and return times to calculate the time respondents are away from home. Of course, this method does not exactly match the time workers spend on the job, because commuting time, lunch, and other breaks are included. Even though comparing departure and return times might overstate time on the job, we still should consider time away from home as an important yardstick of workers' job obligations, because it taps a respondent's availability for child care and other household responsibilities.[16] In some data sets, it might be possible to subtract commuting time and other break time from the total measure of time away from home in order to obtain a more direct measure of time at work. The second goal of this article, then, is to compare the self-reported workweek of respondents with a measure calculated from departure and return times.

Bias in self-reports?

Are there systematic differences between self-reported and calculated working time? Even if there were no overall tendency for self-reports to exaggerate working time, it is possible that some groups of workers tend to overstate their workweeks, while others tend to understate their working time. Such discrepancies could result from three broad types of causes: social psychological factors, job factors, and demographic factors. Some factors might increase the error in reports, while others might cause exaggeration of time on the job. The following discussion examines these possibilities with respect to both exaggeration and error (irrespective of the direction of the errors).

Social psychological. These factors might lead some individuals to exaggerate or otherwise misreport their working time. Those who feel rushed on their jobs, who work with great intensity, or who feel they frequently confront difficult deadlines might inflate their reported working hours, compared with individuals who do not perceive their jobs as being so stressful. Workers who feel torn between the competing demands of home and work may also exaggerate their reports of working time. Individuals who feel a great deal of stress in their lives, whether that stress derives from the job or other sources, may also tend to exaggerate the amount of time they spend on the job. In contrast, those who feel more balance between their work and family lives and those who report more satisfaction with their lives may be less likely to exaggerate their time on the job.

Nature of job. Some workers might inflate their time at work solely because of the nature of their jobs. For example, individuals with nonstandard or irregular schedules might make greater errors than do those with regular schedules. Those who have more flexibility to set their own schedules might be more likely to err, and also to exaggerate the time they spend at work. For example, the self-employed could be more likely to inflate their working time because they might feel more responsible for their businesses, even when they are not technically at work. By contrast, those who are unionized and who have specific overtime provisions in their contracts might be less likely to exaggerate their working hours because they have precise measures of their workweek. Also, those with long tenure in a job should be less likely to misreport their working time, especially if their schedules have been stable for a long period of time.

Demographic attributes. These factors also might lead to misreporting and bias. Workers with small children, for example, might tend to exaggerate their working time because they feel torn between job and family demands. Misreports may vary by age, educational level, race and ethnicity, and marital status, although predictions about the specific direction of these differences are not obvious. Nevertheless, errors in work time reports across these groups could generate bias in estimates of between-group earnings differences.

Reference period

A change in the reference period provides an even simpler alternative to the standard question on the workweek. The standard question asks respondents to indicate the number of hours they worked last week. In some surveys, including the March Current Population Survey, respondents are also asked how many hours they typically worked per week *last year*. The mean and the dispersion of working time might differ when different reference periods are employed. It could be that a longer reference period would reduce the tendency to report very long workweeks and thus would solve the problem of exaggeration quite simply and directly.

Data and methods

The 1992 National Survey of the Changing Workforce (Workforce Survey, for short) was designed to gather data on a wide range of work experiences.[17] The connections between work and family life were the focal point of many of the questions. This analysis includes 3,059 employed individuals from a sample of 3,381 respondents. The Workforce Survey asks respondents when they typically left for and returned from work, and asks a supplemental set of departure and return times for respondents with split shifts. Respondents also were asked questions about the duration of their commute to work as well as how many days per week they worked. A measure

of time on the job, including lunch and breaks, but excluding commuting time (and also excluding work at home), thus can be computed. We refer to this indicator as the "calculated workweek," in contrast to the self-reported workweek. Because the standard self-reported question was also included in the Workforce Survey, comparisons can be made between the two measures for the same respondents. We can see how well these measures correlate, and ascertain whether certain respondents exaggerated their working time. While the CPS data are preferable for point estimates of working time and for the analysis of time trends, the additional variables available in the Workforce Survey allow for useful analyses not possible with the CPS.

Although the data include multiple jobholders, this analysis focuses only on the time spent in respondents' main job because job-specific covariates are more systematically available for the principal job. Thus, self-reports on the number of hours per week spent by respondents in their main or primary job are culled and compared to the time away from home for this job.

The accuracy of recording hours in military time poses a problem for data quality. In some cases, interviewers did not accurately code the military time of respondents' reports of departure and return to work. For example, when respondents indicated they returned from work at 6 PM, the telephone interviewers sometimes entered "600 hours," which represents 6 AM, instead of entering "1800 hours," which is the way 6 PM is represented in military time. There were cases in which respondents left for work at 800 hours and returned from work at 600 hours, for a calculated workday of 22 hours. This would produce a workweek of 110 hours for a 5-day week. These errors tend to inflate the calculated working time and reduce the correlation between self-reported and calculated working time. Return times were changed by 1200 hours systematically when the discrepancy between the calculated and self-reported workweek exceeded 12 hours per day (and were not changed otherwise). This occurred in 161 cases or 5.2 percent of the sample. These cases typically involved a discrepancy of 60 hours per week between the calculated and self-reported workweek for respondents who worked 5 days per week.[18] The impact of these corrections on the results is illustrated later in the results section.

The Workforce Survey data include a wide range of variables that are potentially associated with discrepancies between reported and calculated workweeks. Twenty-two measures were culled for analysis and grouped into three sets of predictor variables: social psychological orientations, job attributes, and demographic measures. The social psychological measures were examined to determine whether respondents who felt especially busy or rushed would exaggerate their hours on the job relative to other respondents. Ten such measures were considered: job satisfaction, thought

of quitting job in last 3 months, enough time to get job done, difficult deadlines, working at a high fraction of one's capacity, supervisor support, family spillover to job, success in balancing work and personal life, satisfaction with current life, and being nervous and stressed in the last 3 months. Seven job attributes also were examined to determine whether some types of jobs produced systematic bias in estimates of the workweek. These included: flexible hours, shift type, union membership, self-employment status, dual-job status, years with employer, and job tenure. Finally, five demographic variables were examined: age, marital status, the presence of children in the household, race and ethnicity, and educational credentials. The appendix lists the specific wording of these questions and the categories available for individuals' responses.

To compare self-reported time measures for different reference periods, this analysis examines data from the March 1997 CPS. In addition to the questions mentioned earlier regarding the previous week, the March Annual Demographic Supplement to the CPS also elicits responses to questions about employment in the previous year. Specifically, March CPS respondents were asked, "Did (name/you) work at a job or business at any time during 1996? "Did (name/you) do any temporary, part-time or seasonal work even for a few days during 1996?" "During 1996 in how many weeks did (name/you) work even for a few hours? Include paid vacation and sick leave as work." "In the (one week/weeks) that (name/you) worked, how many hours did (you/he/she) work (that week/usually work) per week?" We compare the reports about last week and last year to ascertain whether there are any differences in the responses depending on the reference period specified in the questions. In additional analyses (not presented here), it was determined that the differences reported in the results section are not due to the mobility of individuals between 1996 and 1997, but appear to reflect the differences in the reporting period.

Nonfarm wage and salary workers aged 18–64 who worked at least 1 week during 1996 and were employed during the survey week in March, 1997 were selected for this comparison. Note that this sample does not precisely correspond to the employed civilian labor force in March 1997, but it is appropriate for the purposes of comparing hours typically worked in 1996 with hours worked in the survey week in March 1997.

Results

Before correcting for the apparent errors in military time, a moderately strong correlation (r = 0.61) between calculated and self-reported working time was obtained. After these corrections were made, the correlation increased in strength (r = 0.77).

Table 1 presents the distribution of self-reported and calculated workweeks for the entire sample. The mean workweek is slightly longer with the calculated measure than with the self-reported indicator (45.0 versus 42.2). This difference reflects the fact that the calculated measure includes lunch and other breaks that are excluded (in principle) from self-reports.

Do respondents who work long hours exaggerate their time at work? The top panel of table 1 appears to supports this conclusion. Those who reported working 60 or more hours per week on average report working 2.6 hours per week more than the calculated hours (64.8, versus 62.2), while for the rest of the sample, the calculated workweek is longer than the self-reported workweek. However, the second panel of table 1, which displays self-reports arranged by the length of the calculated workweek, suggests the opposite conclusion. These results suggest that those with calculated workweeks of 40 hours or more *understate* the time they spend at work, while those with calculated workweeks of less than 40 hours tend to exaggerate their workweeks.

How can we reconcile the results of the top and bottom panels of table 1? Both were obtained at the same time from the same sample and are merely different representations of the same relationship. These apparently contradictory sets of findings reflect regression to the mean. Those with a self-reported working time of 60 hours per week or more have calculated work times that include some error. These are random errors, but they tend to be below the self-reports because the latter are near the ceiling of this variable. A mirror image of this pattern is observed at the bottom of the distribution. Calculated time exceeds the self-reported working time by the greatest amount for those with the lowest self-reports because random errors tend to inflate these calculated hours.

This pattern can most readily be seen in the third column of table 1, where a random error term is added to respondents' self-reported hours. The mean has been adjusted so that it matches that of the self-reports. The distribution of this variable is compared with the self-reported measure in the top panel of table 1 and compared to the calculated workweek in the bottom panel. The distribution of discrepancies that emerges with this constructed measure, including a random term, is the same as the other discrepancy results (that is, compare columns 4 and 5). Thus, what appears to be exaggeration may instead be merely a reflection of the statistical artifact of regression to the mean between two measures that are correlated with some error.

In self-reports, the apparent pattern of long, exaggerated working hours and short, underreported hours (claimed by Robinson and Bostrom) reflects this pattern of regression to the mean. It may nonetheless be the case that one variable is exaggerated relative to the other, in addition to the regression phenomena discussed here. To test this possibility, we compare the variances of the two variables. If self-reported hours has greater variance than calculated hours, this would indicate that the dispersion is greater and that this measure is exaggerated at the top (and perhaps deflated at the bottom) relative to the calculated measure. (It would not indicate

Table 1.	Distribution of average hours by self-reported workweek versus calculated workweek methods, 1992				
	Self-reported method				
Average hours per week range	Self-reported hours (mean)	Calculated hours (mean)	Self-reported plus random factor	Difference (self-reported hours – calculated hours)	Difference (self-reported hours – self-reported plus random factor)
Total (mean)	42.2	44.8	42.2	−2.6	0.5
0–19 hours	13.8	18.0	20.4	−4.2	−6.6
20–29 hours	23.1	24.9	27.0	−1.8	−3.9
30–39 hours	34.3	38.4	35.7	−4.1	−1.4
40–49 hours	41.9	45.3	41.7	−3.4	.2
50–59 hours	51.7	52.6	49.2	−.9	2.5
60 hours or more	64.8	62.2	60.0	2.6	4.8
	Calculated method				
	Calculated hours (mean)	Self-reported hours (mean)	Self-reported plus random factor	Difference (calculated hours – self-reported hours)	Difference (calculated hours – self-reported plus random factor)
0–19 hours	14.1	20.6	25.7	−6.5	−11.6
20–29 hours	25.1	27.0	30.5	−1.9	−5.4
30–39 hours	35.9	37.0	37.8	−1.1	−1.9
40–49 hours	44.6	42.1	42.0	2.5	2.6
50–59 hours	53.4	49.0	46.7	4.4	6.7
60 hours or more	69.8	58.5	54.9	11.3	14.9

Table 2. Regression analysis of psychological determinants which could be attributed to inflated self-reported workweeks, 1992

Variable	Men		Women	
	Zero-order regression	Multiple regression	Zero-order regression	Multiple regression
Intercept	...	[1]−0.16200 (.0787)	...	−0.1489 (0772)
Job satisfaction	[1].0175 (.0077)	.0077 (.0098)	(.0098) (.0073)	.0118 (.0093)
Thought of quitting in last 3 months	−.0039 (.0049)	.0021 (.0059)	.0009 (.0043)	.0052 (.0053)
Enough time to get job done	.0021 (.0092)	.0023 (.0102)	−.0078 (.0082)	−.0088 (.0092)
Has difficult deadlines	−.0022 (.0083)	−.0035 (.0092)	.0069 (.0084)	.0078 (.0094)
Works at high fraction of capacity	[1].0008 (.0003)	−.0059 (.0114)	.0066 (.0098)	−.0097 (.0101)
Supervisor supports family friendly	−.0001 (.0111)	−.0005 (.0004)	.0111 (.0360)	−.0003 (.0003)
Family spill over to job	−.0043 (.0260)	−.0202 (.0442)	−.0055 (.0097)	.0067 (.0391)
Success in balancing work and personal life	−.0425 (.0421)	[1]−.0268 (.0101)	.0130 (.0094)	.0085 (.0103)
Satisfaction with current life	−.0154 (.0142)	[1].0440 (.0109)	[1]0.0233 (.0084)	[1].0247 (.0104)
Nervous and stressed in last 3 months	−.0111 (.0093)	.0041 (.0066)	−.0024 (.0052)	.0032 (.0062)
R^2	...	.0130	...	.0025

[1]$p< .05$.
SOURCE: National Survey of the Changing Workforce, 1992.

which was closer to the true distribution of working time.) The test of dispersion, however, indicates that calculated time has greater dispersion than self-reported time ($F'=1.18$, df= 3035, $p<.001$). Thus, the reports at the extremes are not artificially inflated for the self-reported workweek, at least compared with the calculated workweek.

Tables 2 through 4 explore whether the discrepancy between these two measures of working time is related to independent variables. On the one hand, if the error in self-reports is highest among specific groups, knowing this will allow us to correct hours (and wage) data accordingly. On the other hand, if self-reported workweeks exhibit random error, then mismeasurement of working time might not be as serious a problem. While the estimates of workweeks and wages (because working time is used to translate wage data into hourly wage measures) will be in error, these errors will be unrelated to major variables of interest.

Table 2 reports regression analyses of the Workforce Survey data which predict the difference in these measures from social psychological measures. These analyses are designed to determine whether individuals' orientations to their life or job tend to exaggerate their responses to questions regarding working time. The first column of results is derived from zero-order regression equations (that is, each variable was entered into an analysis by itself), and the second column reports the results of a multiple regression analysis. Equations were estimated separately for men and women.

There is little evidence that these measures of workers' orientation to their jobs or their life lead them to exaggerate their working time. For example, those who feel rushed at work (that is, those who report not having enough time to get their jobs done or are facing difficult deadlines) are no more likely to exaggerate their working time than are other respondents. Similarly, those who feel they are working at full capacity are no more likely to exaggerate than are those who say they are only working at a fraction of their capacity. In terms of work-family conflict, those who report relatively high levels of conflict between home and work are no more

likely to exaggerate their work time than are those without such conflicts. Individuals who feel that their lives are in balance offer reports on their working time that are similar to persons who feel that their lives are terribly out of balance. Among a range of measures considered (including job satisfaction; thoughts of quitting; satisfaction with current life; and overall stress levels), none consistently predicted the level of exaggeration for men or women.[19] Neither equation explains as much as 1 percent of the variance.

Table 3 repeats the same analysis as does table 2, but substitutes job attributes for social psychological measures as potential predictors of discrepancies between the self-reported and calculated workweeks. Here too, few predictors are statistically significant. For example, individuals with flexible hours or who set their own hours are no more likely to exaggerate their workweeks than are those with standard schedules. There is some evidence that different shift arrangements yield biased work estimates, but these results should not be over-interpreted. The survey did not ask respondents about departure and return times for each shift, and thus the dis-

crepancies between these measures may well be due to the fact that incomplete information about workers' complex schedules produced mistakes in calculated work time. Union status and dual-job status also have no statistically significant effect.

There is some evidence that job tenure reduces reported work time for men, but this may be offset by the fact that years with one's employer tends to increase reported working time. These effects are quite small in magnitude, but warrant further scrutiny. Women who held multiple jobs exaggerated their hours on their primary jobs, but this effect does not appear for men.

Table 4 repeats this analysis for demographic measures. These are included in the analysis for substantive, rather than theoretical, reasons: if one demographic group tends to exaggerate working time relative to other groups, then the wage differentials across these groups might well be biased. Fortunately, few statistically significant differences are evident in table 4. Age, marital status, the presence of children in the household, and race and ethnicity have no consistent effects

Table 3.	Regression analysis of job attribute determinants which could be attributed to inflated self-reported workweeks, 1992			
Attribute	Men		Women	
	Zero-order regression	Multiple regression	Zero-order regression	Multiple regression
Intercept	...	[1]−0.0788 (.0162)	...	−0.0659 (.0155)
Flexible hours	.0030 (.0042)	.0059 (.0045)	.0075 (.0041)	.0041 (.0044)
Working shift arrangements: Day shift (reference group)	...	...	...	...
Night shift	[1].0803 (.0297)	[1].0945 (.0298)	−.0306 (.0315)	−.0298 (.0316)
Rotating shift	[1].0549 (.0264)	[1].0523 (.0262)	−.0361 (.0280)	−.0317 (.0282)
Split shift	−.0309 (.0896)	−.0168 (.0871)	[1]−.2375 (.0769)	[1]−.2209 (.0807)
Flexible shift	−.0078 (.0216)	.0171 (.0229)	[1].0566 (.0211)	[1].0483 (.0229)
Union member	.0003 (.0165)	−.0023 (.0171)	.0024 (.0175)	.0120 (.0180)
Self-employed	−.0291 (.0188)	−.0220 (.0226)	.0248 (.0214)	.0267 (.0252)
Multiple jobholder	.0316 (.0221)	.0384 (.0223)	[1].0555 (.0219)	[1].0544 (.0219)
Years with employer	−.0012 (.0009)	[1].0023 (.0011)	−.0005 (.0009)	−.0013 (.0013)
Tenure in job (in years)	.0005 (.0008)	[1]−.0028 (.0014)	.0001 (.0011)	.0008 (.0016)
R^2	...	.0099	...	.0112

[1] $p < .05$.
SOURCE: National Survey of the Changing Workforce, 1992.

Table 4.	Regression analysis of demographic determinants which could be attributed to inflated self-reported workweeks, 1992			
	Men		**Women**	
Variable	**Zero-order regression**	**Multiple regression**	**Zero-order regression**	**Multiple regression**
Intercept .... …	…	[1]−0.0934 (.0273)	…	−0.0187 (.0268)
Age (in years)	[1].0013 (.0006)	.0013 (.0007)	−.0001 (.0006)	0.0002 (.0006)
Marital status:				
Single (reference group)	…	…	…	…
Married	.0086 (.0125)	.0026 (.0201)	0.0048 (.0122)	−.0188 (.0182)
Remarried	.0262 (.0177)	.0191 (.0257)	−.0095 (.0183)	−.0295 (.0235)
Cohabitating	−.0243 (.0270)	−.0062 (.0302)	−.0295 (.0320)	−.0535 (.0341)
Divorced	.0021 (.0219)	.0075 (.0266)	−.0251 (.0159)	[1]−.0449 (.0215)
Separated	−.0567 (.0561)	−.0413 (.0581)	−.0080 (.0320)	−.0248 (.0351)
Presence of children in household:				
None (reference group)	−	−	−	−
Infants	.0092 (.0192)	.0220 (.0222)	.0035 (.0206)	.0120 (.0227)
Toddlers	.0355 (.0243)	.0389 (.0260)	−.0336 (.0220)	−.0242 (.0236)
Elementary school age	.0316 (.0205)	.0324 (.0220)	−.0040 (.0173)	.0080 (.0184)
Teenage	−.0034 (.0249)	−.0093 (.0261)	.0098 (.0210)	.0180 (.0217)
Race and ethnicity:				
Non-Hispanic whites (reference group)				
Blacks	.0024 (.0175)	.0101 (.0208)	.0018 (.0215)	−.0011 (.0182)
Hispanics	−.0220 (.0219)	−.0028 (.0227)	−.0266 (.0206)	−.0297 (.0213)
Education level:				
College graduate (and higher) (reference group)				
Some college	−.0136 (.0168)	−.0126 (.0170)	−.0127 (.0153)	−.0122 (.0156)
High school graduate	[1]−.0365 (.0151)	[1]−.0360 (.0155)	−.0466 (.0147)	[1]−.0469 (.0150)
Less than high school	[1]−.0738 (.0226)	[1]−.0799 (.0235)	−.0157 (.0249)	−.0181 (.0258)
R^2	…	.0081	…	.0037

[1] $p < .05.$
SOURCE: National Survey of the Changing Workforce, 1993.

on reported working time.

Table 4 does show that individuals with less than a college education tend to underreport their workweeks. This pattern is evident for both men and women. If true, this finding suggests that the educational premium is even higher than what it is generally understood to be, because the modest wages of those with a high school education would need to be divided by a greater number of hours. However, more educated workers might be more likely to bring their work home, an aspect of work that is missed by the calculated workweeks exam-

ined here. Working at home among professionals may compensate for the apparent overreporting by more educated workers documented in table 4. More evidence is needed before concluding that there is systematic bias by educational level in self-reported workweeks.

Tests for interaction terms were conducted to determine if exaggeration emerges among those reporting the longest hours. In other words, when terms for 40 hours plus (and then 50 hours plus) were interacted with each of the predictor variables included in tables 2 through 4, few statistically significant results were obtained.[20]

The above analyses test for exaggeration rather than errors in reporting. In other words, while the results presented in tables 2 through 4 consider whether some groups tend to inflate their self-reported time on the job, it is also possible that some groups tend to have especially high rates of error in their self-reports, irrespective of direction. However, as was the case in the results presented in tables 2 through 4, an analysis of this question revealed random rather than systematic errors. Few variables were statistically significant, even fewer were consistent between men and women, and these explained a very small fraction of the variance. [21]

Reference periods: last week or last year

Table 5 compares self-reported workweeks based on March 1997 CPS data for two reference periods (last week versus last year), and reports them separately for men and women. The mean length of the workweek is similar for these two time periods. For men, the two means are statistically indistinguishable, despite the large sample. Women reported working slightly longer weeks last year, compared with last week,

but the difference amounts to only four-tenths of 1 hour. However, the variance in the "last week" measure is higher than that observed in the "last year" measure. These differences are statically significant for both men and women. In short, the proportion of respondents who report working more than 50 hours per week is lower when the reference period is last year, compared with last week. The proportion reporting usually working part-time (less than 30 hours per week) is also lower for last year than last week. Thus, if exaggeration tends to occur among those at the high end of the hour's distribution, then reliance on hourly data referenced over a longer time might help to minimize the problem.[22] Just as one study finds that the correlation between firm and worker data is higher for annual than for weekly data, these results point to the advantage of soliciting information about labor market behavior averaged over the previous year, or at least over periods longer than the previous week.[23]

Conclusions

There are four principal findings in this article. First, the data indicate that the discrepancy between time-diary and self-reported measures of working time reflects a "regression to the mean" in measures that are correlated with error. The results closely resemble the Robinson and Bostrom finding by adding a random component to the self-reported time measure and then comparing the two distributions.

Second, independent measures of working time largely corroborate the self-reported measures relied on by the standard surveys, such as the census and the CPS. A workweek calculated from departure-and-return-time, minus commuting time, is slightly longer than the self-reported workweek, and correlates with self-reports quite strongly.

Third, the discrepancies between the calculated workweek and the self-reported workweek are not highly patterned. In other words, few predictor variables account for the gaps between self-reported and calculated working time. To the extent that self-reported measures are in error, the errors appear to be largely random in nature. This is reassuring because, for most statistical analyses, random error is less serious than is patterned error.

And, fourth, data on "hours usually worked last year" tend to have less dispersion than those that involve "hours worked last week." The reference period thus seems to influence the extent of reporting at the extremes. If the greater dispersion of working time in the "last week" measure is seen as a reflection of a tendency of respondents to exaggerate their work schedules, then changing the reference period might be the simplest solution to the problem. Researchers of working time who are interested in the behavior of workers at the extremes of the distribution can produce more conservative estimates by relying on data with an annual, rather than a weekly reference period.

Table 5.	Trends in hours usually worked last week, for male and female nonfarm wage and salary workers, 1970–90		
Category	Mean hours, all jobs (standard deviation)	Percent working less than 30 hours per week	Percent working 50 or more hours per week
Men, 1997 (n=24,889): Hours worked last week	42.66	9.26	25.40
Standard deviation	(12.46)	...	...
Hours usually worked last year	42.60	5.78	22.97
Standard deviation	(10.05)	...	...
Women, 1997 (n=23,968): Hours worked last week	36.90	19.78	10.93
Standard deviation	(11.93)	...	...
Hours usually worked last year	37.30	16.00	9.23
Standard deviation	(10.30)	...	...

The standard self-reported measure of working time is a reasonably reliable indicator of time use at least in the broad range in which most workers are employed. Time diary and other measures of time use are surely useful, but should be viewed as supplementing, rather than supplanting, standard measures of the workweek. The conceptual differences in time measures should be noted. Time diaries attempt to measure actual working time, rather than time spent at work. Both of these aspects of work are important to measure.

Nevertheless, standard self-reported measures of the workweek do not appear to exaggerate the workweek for individuals working long hours. Further research on all aspects of workweek measurements, including reference periods, the sequence of questions on surveys, the use of time diaries, time sampling with beepers, and other techniques, is recommended. ☐

Footnotes

[1] Thomas J. Kneisner, "Review Essay: The Overworked American?" *Journal of Human Resources,* vol. 28, no. 33, pp. 681–88; Barry Bluestone and Stephen Rose, "Overworked and Underemployed: Unraveling an Economic Enigma," *The American Prospect,* March-April 1997, pp. 58–69; and Jerry A. Jacobs, and Kathleen Gerson, "The Endless Day or the Flexible Office? Working Hours, Work-Family Conflict, and Gender Equity in the Modern Workplace." Report for the Alfred P. Sloan Foundation, 1997.

[2] Arlie R. Hochschild, *The Time Bind: When Work Becomes Home and Home Becomes Work* (New York, Metropolitan Books, 1997).

[3] Sylvia Ann Hewlett, and Cornell West, *The War Against Parents: What We Can Do for America's Beleaguered Moms and Dads* (New York, Houghton Mifflin, 1998); Rosalind C. Barnett, "Home-to-Work Spillover Revisited: A Study of Full-Time Employed Women in Dual-Earner Couples," *Journal of Marriage and the Family,* 1994, vol. 56, pp. 647–56; and Ellen Galinsky, James T. Bond, and Dana E. Friedman, *The Changing Workforce: Highlights of the National Study* (New York, Families and Work Institute, 1993).

[4] John P. Robinson, and Geoffrey Godbey, *Time for Life: The Surprising Ways Americans Use Their Time* (University Park, PA, Pennsylvania State University Press, 1997); and John P. Robinson and Ann Bostrom, "The overestimated workweek? What the time diary measures suggest," *Monthly Labor Review,* August 1994, pp. 11–23.

[5] Philip L. Rones, Randy E. Ilg, and Jennifer M. Gardner, "Trends in the hours of work since the mid-1970s," *Monthly Labor Review,* April 1997, pp. 3–14; and Jacobs, and Gerson, "The Endless Day?" The Current Population Survey is a monthly survey of more than 50,000 households conducted by the Bureau of the Census for the Bureau of Labor Statistics.

[6] Juliet Schor, *The Overworked American* (New York, Basic Books, 1991).

[7] Hourly wages are typically computed by dividing earnings by hours worked. If the true working time were less than reported working time, the hourly wage would be higher. The potential concentration of this effect among high earners would inflate estimates of inequality and the returns to education, and affect analyses of other behavior that is associated with wages. See Mary T. Coleman and John Pencavel, "Changes in Work Hours of Male Employees, 1940–1988," *Industrial and Labor Relations Review*, vol. 46, no. 2, 1993, pp. 262–83. Also see Mary T. Coleman and John Pencavel, "Trends in Market Work Behavior of Women Since 1940." *Industrial and Labor Relations Review,* vol. 46, no. 4, 1993, pp. 653–76.

[8] The Bureau of Labor Statistics collects another series of data based on employer reports (establishment data) regarding production workers, but this does not cover the entire labor force and it does not allow for an understanding of individuals who may hold more than one job. See *Employment and Earnings* (Bureau of Labor Statistics, January 1997) for a comparison of household and establishment data series.

[9] Robinson and Godbey, *Time for Life,* 1997.

[10] Willard L. Rodgers, Charles Brown, and Greg J. Duncan, "Errors in Survey Reports of Earnings, Hours Worked, and Hourly Wages," *Journal of the American Statistical Association*, vol. 88, no. 424, 1993, pp. 1208–18; and John Bound, Charles Brown, Greg. J. Duncan, and Willard L. Rodgers, "Evidence on the Validity of Cross-sectional and Longitudinal Labor Market Data." *Journal of Labor Economics,* vol. 12, no. 3, 1994, pp. 345–68.

[11] Robinson and Bostrom, "The overestimated workweek?"; and Robinson and Godbey, *Time for Life*. In the time-diary approach, respondents are asked to recall all of their activities during 24 hours of a day.

[12] A weekly diary might avoid this problem, but it is even more expensive to collect. Moreover, the accuracy of time-diary data over the period of a week has yet to be determined. It could be that respondents would tire of filling out diaries after a few days, and might become increasingly sloppy in their reporting and forgetful of the activities in which they engaged.

[13] Barbara Schneider, Mihaly Csikszentmikhalyi, and Shaunti Knauth, "Academic Challenge, Motivation and Self-Esteem: The Daily Experiences of High School Students," in Maureen T. Hallinan, ed., *Restructuring Schools: Promising Practices and Policies* (New York, Plenum, 1995), pp. 175–95.

[14] Mihaly Csikszentmikhalyi, K. Rathunde, and S. Whalen, *Talented Teenagers: The Roots of Success and Failure* (London, Cambridge University Press, 1993). In their book, the authors solve the problem of aggregating measures of particular moments into a weekly schedule by reporting the percentage of time spent in various activities, rather than the amount of time. The aggregation issue might well be more challenging for the estimation of adult work schedules.

[15] A more detailed measure would ask respondents to indicate the departure and return times for each day in the survey week or the previous week. This would avoid the potential problem of misreports about what is a "typical" day. However, the last section of this article uses the "typical day" as a reference period, which might average out responses and result in a more reliable measure.

[16] On the other hand, measuring time away from home misses time spent working at home.

[17] Galinsky and others, *The Changing Workforce*, 1993.

[18] In nearly three-fifths of the cases, the corrected calculation improved the match with self-reported hours by 60 hours per week (a 12-hour change per day over a 5-day workweek). Most of the other changes were also sizable: 83.8 percent of the corrections involved an improvement in fit of 48 hours per week or more.

[19] Greater life satisfaction is associated with greater exaggeration for women, but this effect is small, is not evident for men, and is not consistent with expectations. Job satisfaction and working to a high percentage of one's capacity are both associated with greater exaggeration for men, but neither effect persists in a multivariate analysis.

[20] Results are available from the author via e-mail: jjacobs@sas.upenn.edu.

[21] Results are available from the author via e-mail: jjacobs@sas.upenn.edu.

[22] It may be possible to ask respondents about the length of the typical workweek, in addition to the hours spent working last week. This type of question might have the same properties as the "last year" measure without the drawback of forcing people to think about their work situation a year ago.

[23] Rodgers and others, "Errors in survey reports," pp. 1208–18.

Appendix: Selected questions, National Survey of the Changing Workforce

1. SATISFACTION WITH PRESENT JOB

Overall, how satisfied are you with your present job?
Are you...

1 very satisfied,
2 somewhat satisfied,
3 somewhat dissatisfied, or
4 very dissatisfied?
–2 DON'T KNOW
–1 REFUSED

2. PAST 3 MONTHS: THOUGHT OF QUITTING

How often in the past three months have you thought about quitting your job?
Would you say quite often, often, sometimes, rarely, or never?

1 QUITE OFTEN
2 OFTEN
3 SOMETIMES
4 RARELY
5 NEVER
–2 DON'T KNOW
–1 REFUSED

3. ENOUGH TIME TO GET JOB DONE

I have enough time to get the job done.
PROBE: Do you strongly agree, agree, disagree, or strongly disagree?

1 STRONGLY AGREE
2 AGREE
3 DISAGREE
4 STRONGLY DISAGREE

4. HAS DIFFICULT DEADLINES

I have deadlines that are difficult to meet.
PROBE: Do you strongly agree, agree, disagree, or strongly disagree?

1 STRONGLY AGREE
2 AGREE
3 DISAGREE
4 STRONGLY DISAGREE
–4 NEITHER/NOR
–3 N/A
–2 DON'T KNOW
–1 REFUSED

5. WORK AT __% CAPACITY

Not all jobs require that people work to their full capacity.
On a scale from zero to 100 percent, to what extent are you working to your full capacity?

6. SUPERVISOR ACCOMMODATES FAMILY CARE

My supervisor accommodates me when I have family or personal business to take care of, for example, medical appointments, meeting with child's teacher, etc.
PROBE: Do you strongly agree, agree, disagree, or strongly disagree?

1 STRONGLY AGREE
2 AGREE
3 DISAGREE
4 STRONGLY DISAGREE
–4 NEITHER/NOR
–2 DON'T KNOW
–1 REFUSED

7. FAMSPILL: FAMILY TO JOB SPILLOVER

(This variable averages valid responses to fourteen items regarding family spillover to work if the respondent has at least nine valid responses to these items.)

8. RATE SUCCESS: BALANCE WORK AND PERSONAL

How successful do you feel at balancing your work and personal or family life?
Do you feel...

1 Very successful,
2 Somewhat successful,
3 Somewhat unsuccessful, or
4 Not successful at all?
–4 NEITHER/NOR
–2 DON'T KNOW
–1 REFUSED

9. SATISFACTION WITH CURRENT LIFE

All things considered, how do you feel about your life these days?

Would you say you feel very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?

1 VERY SATISFIED,
2 SOMEWHAT SATISFIED,
3 SOMEWHAT DISSATISFIED, OR
4 VERY DISSATISFIED
–4 NEITHER/NOR
–2 DON'T KNOW
–1 REFUSED

10. PAST 3 MTHS: NERVOUS AND STRESSED

During the past three months, how often have you felt nervous and stressed?
Would you say...

1 very often,
2 often,
3 sometimes,
4 rarely, or
5 never?
–2 DON'T KNOW
–1 REFUSED

11. CONTROL OF SCHEDULE

Overall, how much control would you say you have in scheduling your work hours: none, very little, some, a lot, or complete flexibility?

1 NONE
2 VERY LITTLE
3 SOME
4 A LOT
5 COMPLETE FLEXIBILITY
–2 DON'T KNOW
–1 REFUSED

12. USUAL SHIFT

Which of the following best describes the hours that you usually work at your main job?

1 a regular day time schedule,
2 a regular evening shift,
3 a regular night shift,
4 a rotating shift—one that changes periodically
   from days to evenings or nights,
5 a split shift—one consisting of two distinct
   periods each day,
6 a flexible or variable schedule with no set hours, or
0 something else? [specify]
–2 DON'T KNOW
–1 REFUSED