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Are We Having More Fun Yet? Categorizing and Evaluating Changes in Time Allocation

ARE AMERICANS SPENDING THEIR time in more or less enjoyable ways today than in earlier generations? The answer to this question is central for understanding economic and social progress yet has been elusive and controversial. From 1965–66 to 2005, for example, working-age American women increased the amount of time spent working for pay, watching television, and caring for adults while they reduced the amount of time spent cooking, cleaning, entertaining friends, and reading books. Do these shifts imply that women are better off or worse off?

Gary Becker and Reuben Gronau provided the modern economic framework for modeling time allocation among market work, home production, and leisure.[1] More recently, Valerie Ramey and Neville Francis, and Mark Aguiar and Erik Hurst, have made thorough attempts to apportion historical time-use data into these categories.[2] These studies are controversial and reach conflicting conclusions, however, in part because external judgments were used to classify activities into home production,

1. Becker (1965); Gronau (1977).
2. Ramey and Francis (2006); Aguiar and Hurst (2007).

leisure, and market work.[3] Would the average person classify gardening, for example, as leisure or home production? Another problem is that it is unclear how to trade off shifts in time allocation across categories, or within them, when it comes to evaluating individuals' welfare. Not all leisure activities are equally enjoyable, nor are all home production tasks equally taxing.

This paper provides two alternatives to the traditional work, home production, and leisure breakdown for evaluating welfare changes associated with trends in time allocation. The first method assigns activities to categories based on six dimensions of participants' reported affective experiences (feeling interested, stressed, happy, sad, pain, and tired) during various activities. The second makes use of the U-index, a measure of the percentage of time spent in an unpleasant state, defined as an episode in which the strongest emotion is a negative one. The U-index is computed for each of seventy-two activities in 2006, using an activity coding scheme that can be applied to historical time-use data (harmonized activities) and assigned to past data from 1965 to 2005 to summarize trends in time allocation. Both analyses make extensive use of the Princeton Affect and Time Survey (PATS), a national survey of time use and affective experience. The PATS, like other diary-based measures, probably yields a more accurate measure of affective experience than do questions about general enjoyment with particular activities.[4]

The methods presented here have three principal advantages over previous categorizations of time used by economists and sociologists. First, the categories are based on subjects' reported experiences, not researchers' judgments. Second, different types of leisure and home production activities are assigned to distinct categories if they are associated with different feelings and therefore represent distinct experiences. Third, the classification scheme is based on multiple aspects of affective

3. To their credit, the papers are transparent about their classification decisions and often examine the robustness of their conclusions to alternative decisions. Sociologists (for example, Michelson, 2005), have used a broader set of categories, distinguishing among paid work, household work, child care, active leisure, and passive leisure. These classifications may capture affective experience better than home production, work, and leisure, but they, too, require external judgments.

4. Kahneman and Krueger (2006); Robinson and Godbey (1997); Gershuny and Halpin (1996).

experience, not a unidimensional measure of enjoyment as in Thomas Juster's landmark study.[5]

The main substantive findings are that the share of time devoted to "mundane chores" such as ironing has decreased over the last four decades, while time spent on "neutral downtime" activities, such as watching television, has increased. On net, however, there have *not* been major shifts in time allocation toward more or less unpleasant activities for men and women combined. Men have experienced a gradual downward trend in the proportion of time spent in unpleasant activities as measured by the U-index; for women there is no detectable trend in the U-index despite significant changes in underlying time allocation.

The next section describes the PATS data in more detail. The two sections that follow describe and implement a method for classifying activities into six distinct categories and then use these categories to summarize trends in time allocation since the mid-1960s. The penultimate section describes and implements the U-index method, and the paper concludes with a discussion of extensions and limitations of the analysis.

The Princeton Affect and Time Survey

The PATS is a new source of data on time use and affective experience. The survey questionnaire was designed by the author and administered by the Gallup Organization in a random-digit-dial telephone survey of U.S. residents from May to August of 2006. The PATS is patterned on the Bureau of Labor Statistics' American Time Use Survey (ATUS) and the Day Reconstruction Method.[6]

The survey was implemented as follows. Respondents were first asked to describe each episode (defined as an interval of time in which the respondent was engaged in a specified activity; the average respondent reported 17.8 episodes) of the preceding day, as in the ATUS. Information about the activity the respondent engaged in was collected for each

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5. Juster (1985).

6. See Kahneman and others (2004) for a discussion and evaluation of the Day Reconstruction Method. The PATS questionnaire and related documentation are available at www.krueger.princeton.edu.

episode. After the entire day was described in this manner, three episodes were randomly selected in proportion to duration and without replacement. Respondents were asked the degree to which they experienced six different feelings (pain, happy, tired, stressed, sad, and interested) during each of these episodes on a scale from 0 to 6, where they were instructed that a 0 meant they did not experience the feeling at all at the time and a 6 meant the feeling was very strong. Specifically, respondents were asked to report their feelings during a randomly selected fifteen-minute interval of the sampled episodes. The order in which the feelings were presented was randomly assigned across respondents from six different permutations.

Weights were developed by Gallup to make the sample representative of the general population in terms of geographic region, gender, age, and race. The weights were based on counts from the Current Population Survey. The weighted allocation of time across activities closely matched that in the ATUS data for the corresponding months of 2004 and 2005 ($r = 0.99$), which suggests that the weighted sample is representative of the population, at least in terms of time use.

Interviews were conducted in English or Spanish. A total of 3,982 people age fifteen and older completed the survey, for a response rate of 37 percent. Sixty-one percent of the unweighted respondents were women, 88 percent were white, 90 percent had a high school education or higher, and 40 percent had household income less than $40,000 a year. The average age was 51.4 years. Reweighting the sample to represent the population resulted in some significant distributional changes. Most notably, compared with the unweighted sample, the weighted sample had fewer women (53 percent), higher income (36 percent below $40,000), and a lower average age (45.2 years).

The affect data collected in the PATS are similar to the idea of "process benefits" referred to by Gregory Dow and Juster.[7] Individuals receive a certain flow utility, or flow of emotional experience, while engaged in various activities. Some activities, such as work or setting the table, are ordinarily undertaken for the payoff received during other episodes rather than for their immediate emotional experience. Nonetheless, the emotional experience during these activities is relevant to individuals' subjective well-being, and the spillover benefits from these activities are, in principle, registered during other episodes in the survey (for example,

7. Dow and Juster (1985).

during meal time). The description that emerges from the episodic affect data is unaffected by the fact that the full benefit (or cost) of some activities may be delayed, as long as a representative sample of time is surveyed. It goes without saying that the affect data cannot be used to make causal statements about how individuals should optimally allocate their time, without knowing how time spent during particular episodes affects well-being at other times or why people choose to engage in certain activities.[8] One would need to undertake experimental manipulation of time use to draw causal inferences about how changes in activities or in the environment would influence affective experience over a longer period. Still, tracking time use in affectively similar categories provides a rich description of how society's subjective well-being evolves over time, just as the national income accounts provide a useful description of trends in society's income over time.

Clustering Activities

The weighted-average ratings of pain, happy, tired, stressed, sad, and interested that were reported during the various activities were used to assign activities to categories. These emotions were chosen, in part, to represent points along J. A. Russell's circumplex model of affect.[9] According to this model, emotions are positioned along two dimensions, "pleasure-displeasure" and "activated-deactivated." Specifically, K-means cluster analysis was used to identify six groups of activities such that all activities in each group are associated with similar emotional experiences. Cluster analysis is a family of techniques for assigning observations to groups (clusters) in a way that minimizes the discrepancies within groups and maximizes discrepancies between groups. The algorithm for the cluster procedure used here minimizes the sum of squared Euclidean distances of the emotions associated with the activities from their cluster means.

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8. An analogy to the national income accounts is instructive. One could observe that doctors are paid more than the average worker and that their pay contributes significantly to national income, but one cannot draw a causal inference that national income will be higher if more people became doctors, unless one knows the cost of doctors' education and the incomes that those who become doctors would have earned in other occupations. This inconvenience does not diminish the usefulness of tracking national income.

9. Russell (1980).

Activities are the unit of observation for the cluster analysis. Activities in the PATS were originally coded with the same scheme and algorithm that the Census Bureau uses for ATUS. Because a goal here is to make historical comparisons, however, the ATUS activity codes were converted to the seventy-two harmonized codes used in the American Heritage Time Use Studies (described below).[10]

Two additional features of the analysis are worth noting. First, the activities were weighted by their relative frequencies.[11] Thus, the resulting clusters can be thought of as minimizing the weighted sum of within-group variances. Second, because cluster analysis is an iterative procedure that can be sensitive to the starting point, the cluster command was executed thirty-five times using randomly selected starting points, and the estimate with the highest Calinski and Harabasz pseudo-F statistic was selected. The Calinski-Harabasz pseudo-F is defined as

$$ F = \frac{\text{trace}(B)/(g-1)}{\text{trace}(W)/(n-g)}, $$

where B is the between-cluster sum of squared deviations and cross-products matrix, W is the within-cluster sum of squares and cross-products matrix, g is the number of groups, and n is the sample size.

Table 1 reports the optimal cluster assignments for the most frequently reported activities and the average ratings for each of the six emotions. In addition, the table reports "net affect," which is the average of the positive emotion (happy) less the negative ones (sad, pain, stressed).[12] Many of the cluster assignments make intuitive sense. Paid work performed at home and away from home, for example, both fall in cluster 6, as does helping

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10. The concordance was from the Center for Time Use Research (www.timeuse.org/ahtus/documentation). The concordance contains ninety-two activities, fourteen of which could not be coded in the ATUS. Several of the activities involve caring for children of different ages; we combined these into a single activity. We omitted sleeping and napping and a small number of infrequent activities that were not covered by PATS.

11. Because Stata does not have a weight option in its cluster analysis function, a new dataset was created in which each activity could be represented multiple times in proportion to its relative frequency.

12. Net affect is a controversial measure because it treats the positive and negative emotions equally and in an additive fashion. It is also unclear how to integrate some features of experience, such as interest and tiredness, into net affect.

Table 1. Cluster Assignment of Activities from the 2006 Princeton Affect and Time Survey

Activity	Cluster	Net affect[a]	Happy	Tired	Stress	Sad	Interested	Pain	No. of episodes
Personal medical care	1	0.21	2.34	3.69	2.21	1.06	2.70	3.10	24
Financial/government services	1	0.32	2.87	3.19	3.40	1.86	3.34	1.92	20
Homework	1	0.80	2.71	3.08	3.32	0.94	3.08	1.47	43
Purchase medical services	1	2.08	3.67	2.77	2.51	0.74	4.08	1.63	80
Writing by hand	2	2.79	3.46	1.97	0.96	0.52	3.69	0.53	34
Purchase routine goods	2	3.08	4.03	2.29	1.46	0.52	3.96	0.88	218
Other child care	2	3.08	3.93	2.43	1.32	0.48	3.79	0.73	30
Use computer	2	3.24	3.99	2.17	1.16	0.55	4.52	0.55	240
Second job, other paid work	2	3.40	4.39	2.49	1.42	0.66	4.48	0.90	67
Other meals and snacks	2	3.61	4.47	2.42	1.15	0.58	3.91	0.83	971
Walking	2	3.95	4.66	1.56	0.64	0.27	4.21	1.22	56
General voluntary acts	3	3.36	4.22	2.41	1.40	0.61	4.86	0.57	53
Conversation, phone, texting	3	3.42	4.55	2.44	1.50	0.93	4.61	0.98	377
Read books	3	3.49	4.36	2.35	0.94	0.83	4.81	0.87	474
Receive or visit friends	3	3.79	4.71	2.71	1.25	0.59	4.77	0.90	187
Read to/with, talk with children	3	3.92	4.73	2.61	1.45	0.39	4.72	0.58	35
Travel related to consumption	3	4.04	5.02	2.87	1.86	0.51	4.23	0.55	18
Other in-home social, games	3	4.08	4.77	2.23	1.04	0.25	4.92	0.78	121
Pet care, walk dogs	3	4.14	4.91	2.89	1.06	0.49	4.51	0.75	104
Worship and religious acts	3	4.24	4.97	1.70	0.90	0.66	5.09	0.61	151
Sports and exercise	3	4.26	5.09	2.87	0.89	0.25	4.97	1.34	208
Café, bar	3	4.39	5.00	2.24	0.88	0.29	4.59	0.66	255
General out-of-home leisure	3	4.39	4.91	1.91	0.46	0.38	4.49	0.69	29

(continued)

Table 1. Cluster Assignment of Activities from the 2006 Princeton Affect and Time Survey (*Continued*)

Activity	Cluster	Net affect[a]	Happy	Tired	Stress	Sad	Interested	Pain	No. of episodes
Purchase personal services	3	4.43	5.06	2.08	0.69	0.16	4.33	1.05	22
Parties or receptions	3	4.72	5.24	2.04	0.88	0.29	5.00	0.38	90
Hunting, fishing, boating, hiking	3	4.73	5.32	1.91	0.74	0.36	5.26	0.68	30
Attend sporting event	3	4.74	5.24	1.73	0.78	0.04	4.97	0.69	21
Play with children	3	4.81	5.41	2.49	0.74	0.21	4.69	0.86	40
Listen to music (CDs, etc.)	3	4.81	5.33	1.56	0.38	0.35	5.06	0.84	22
Watch television, video	4	2.94	3.91	2.94	1.17	0.82	3.97	0.94	1,946
Food preparation, cooking	4	3.14	4.25	2.65	1.63	0.60	3.91	1.11	452
Relax, think, do nothing	4	3.25	4.40	2.77	1.31	0.80	3.96	1.34	313
Gardening	4	3.34	4.26	2.79	0.92	0.43	3.88	1.41	306
Set table, wash/put away dishes	5	2.28	3.32	2.81	1.45	0.68	2.76	0.93	145
Laundry, ironing, clothing repair	5	2.46	3.33	2.28	1.11	0.61	2.73	0.94	187
Adult care	5	2.56	3.90	2.56	1.72	1.19	3.82	1.10	87
Cleaning	5	2.63	3.72	2.85	1.61	0.62	3.54	1.05	327
Other domestic work	5	2.63	3.76	2.59	1.85	0.66	3.87	0.90	368
Travel related to leisure/other	5	3.00	4.02	2.73	1.66	0.57	3.43	0.79	1,120
Wash, dress, personal care	5	3.11	4.31	3.16	1.78	0.77	3.39	1.02	140
Home repairs, maintain vehicle	6	2.22	3.50	2.76	1.97	0.85	3.95	1.03	89
Paid work at home	6	2.35	3.47	2.66	2.01	0.63	4.00	0.71	207
Regular schooling, education	6	2.42	3.77	3.73	2.69	0.89	4.01	0.48	70
Main paid work (not at home)	6	2.55	3.83	2.72	2.44	0.69	3.98	0.71	1,425
General care of older children	6	3.55	4.54	3.41	1.98	0.45	4.36	0.54	235

Source: Author's calculations using data from the Princeton Affect and Time Survey. Table is restricted to the forty-five most frequent activities.
a. Average of positive emotions (happy) minus negative emotions (stress, sad, and pain). All emotions are reported on a 0 to 6 scale, where 6 is the strongest.

Table 2. Averages of Emotions by Cluster[a]

Cluster	Happy	Tired	Stressed	Sad	Interested	Pain	Net affect
1	3.09	2.97	2.92	1.18	3.57	1.80	1.12
2	4.29	2.31	1.18	0.55	4.06	0.78	3.45
3	4.79	2.37	1.05	0.56	4.79	0.84	3.97
4	4.05	2.87	1.23	0.76	3.95	1.06	3.04
5	3.86	2.72	1.64	0.63	3.44	0.89	2.80
6	3.88	2.83	2.35	0.69	4.04	0.69	2.63

Source: Author's calculations using data from the Princeton Affect and Time Survey.

a. Averages are weighted by episode frequency and sample weights. All emotions are reported on a 0 to 6 scale, where 6 is the strongest.

someone with homework. Home production activities, including cleaning and putting away dishes, are mostly assigned together in cluster 5. There are some unexpected results, however. For example, time on a second job is classified in cluster 2 whereas other paid work is in cluster 6.

Table 2 reports the means of the six emotions and net affect for each cluster of activities. The lowest-rated cluster in terms of net affect is cluster 1, which includes receiving medical care, purchasing medical services, seeking government services, and doing homework. Cluster 2 involves such tasks as writing and using a computer. The most enjoyable and interesting activities are in cluster 3, including religious activities, exercise, attending parties, listening to music, playing with children, and recreation. Cluster 4 is a mixture of activities, such as watching television, relaxing, cooking, and gardening, that are close to average in terms of affect ratings. Cluster 5, which includes domestic activities such as doing laundry, ironing, caring for adults, and cleaning, is slightly above cluster 6 (paid work) in terms of net affect but well below it in terms of interest.

If one were to use value-laden terms to describe the clusters, one could think of cluster 1 as unpleasant personal maintenance, cluster 2 as moderately enjoyable tasks, cluster 3 as engaging leisure and spiritual activities, cluster 4 as neutral downtime and cooking, cluster 5 as mundane chores, and cluster 6 as work and work-like activities.

One caveat to bear in mind is that average affect ratings are conditional on engaging in the activity for a given length of time. People probably sort the activities that they engage in based, in part, on how much utility they derive from them. It is reassuring to note, however, that if person fixed effects are removed, the correlation (weighted by frequency) between net affect across activities in the unadjusted and within-person data is 0.92.

(The unweighted correlation is 0.72.) Moreover, if the cluster analysis is redone using residuals of the six emotions after removing person effects, 83 percent of activities (weighted by frequency) remain in the same cluster as in the original assignment that did not remove person effects.

Historical Data on Time Use

To make comparisons in time use across decades, data were obtained from a project originally of the Yale University Program on Non-Market Accounts, known as the American Heritage Time Use Studies (AHTUS). The AHTUS consists of five time-use surveys conducted from 1965–66 through 2003. The disparate activity codes were harmonized to a common set of seventy-two main activities (plus missing/unclassified). In addition, the harmonized activity codes were merged to the 2005 ATUS and the latter included as well. The underlying sources of the harmonized data are as follows:

—for 1965–66, the Multinational Comparative Time-Budget Research Project, conducted by the University of Michigan's Survey Research Center, $N = 1,968$
—for 1975–76, Americans' Use of Time: Time Use in Economic and Social Accounts, conducted by the University of Michigan's Survey Research Center, $N = 5,869$
—for 1985, Americans' Use of Time, conducted by the University of Michigan's Survey Research Center, $N = 2,308$
—for 1992–94, the National Human Activity Pattern Survey, conducted by the University of Maryland's Survey Research Center, $N = 5,964$.
—for 2003, the ATUS, conducted by the Census Bureau for the Bureau of Labor Statistics, $N = 15,999$
—for 2005, the ATUS, conducted by the Census Bureau for the Bureau of Labor Statistics, $N = 10,112$.

Sample weights were used for all estimates. Because affect ratings during sleep are unavailable, the focus is on the waking day.[13] One issue that

13. Average time asleep rose from 7.95 hours in 1965–66 to 8.5 hours in 2005, or by 2.3 percentage points on a twenty-four-hour day.

can only be partially addressed is that the datasets use different methods and sampling frames. For example, the 1965–66 survey sampled people from households in which someone was employed in a nonagricultural industry, and the survey covered only certain months of the year.[14] The samples were restricted to those aged nineteen to sixty-four so as to have a consistent age range. The average age was fairly similar in the datasets, ranging from 38.4 in 1985 to 40.6 in 2003.

Appendix tables A1 and A2 present, respectively, the average proportions of women's and men's awake time spent in the harmonized activities in each of the six surveys. A motivation of the cluster analysis was to classify these activities into affectively similar categories so that changes in time use could be tracked in a more manageable set of categories.

Specifically, the average percentage share of the waking day spent in each of the six clusters described above was computed for each person, and these shares were then averaged over all respondents.[15] The top panel of table 3 summarizes the results for men and women combined. The picture that emerges is one of stability for clusters 1 (unpleasant personal maintenance), 2 (moderately enjoyable tasks), and 6 (work-like activities): the portion of the day spent in these activity clusters has changed little over time. In contrast, time spent on cluster 4 (neutral downtime) is up, and time spent on cluster 3 (engaging leisure) and cluster 5 (mundane chores) is down. Overall, these figures suggest that, over the last forty years, affectively neutral downtime activities like watching television have gained at the expense of mundane chores and engaging leisure activities.

The bottom two panels of table 3 report separate results for men and women. For men, the share of the day devoted to cluster 6 (work and work-like activities) has declined by 6 percentage points since 1965–66, while the share devoted to cluster 4 (neutral downtime) has increased by 8.5 points. Women, not surprisingly, have increased their time in cluster 6 activities by 5 percentage points, while their time spent on mundane chores has fallen even more, by almost 7 points. The amount of time women spend in cluster 3 (engaging leisure) fell by roughly the same amount (3 points) as their time devoted to cluster 4 (neutral

14. Aguiar and Hurst (2007) use the same underlying data, and so differences in datasets are unlikely to account for any differences in results.

15. Because a small number of activities (accounting for less than 3 percent of awake time each year) were not assigned to clusters in the PATS, they are omitted here. The percentages were renormalized to sum to 100 percent accordingly.

Table 3. Portion of the Waking Day Spent in Each Cluster, 1965–66 to 2005
Percent of average day

Cluster	1965–66	1974–75	1985	1992–94	2003	2005
All respondents						
1	4.2	3.6	3.9	5.8	4.4	3.8
2	10.7	12.1	11.8	9.5	11.1	11.5
3	19.8	19.6	19.0	16.5	18.3	17.1
4	16.3	20.3	20.1	21.2	20.6	22.3
5	17.6	15.2	16.3	14.6	14.0	14.1
6	31.4	29.2	28.9	32.4	31.6	31.2
Men						
1	4.5	4.0	4.2	5.0	3.9	3.6
2	10.7	11.5	11.2	9.4	10.8	11.1
3	18.2	17.5	17.8	15.5	17.4	16.1
4	14.5	17.3	18.8	20.7	20.9	23.0
5	9.7	10.2	12.6	11.4	10.4	10.2
6	42.4	39.5	35.4	38.0	36.5	36.0
Women						
1	4.0	3.2	3.6	6.5	4.9	3.9
2	10.7	12.5	12.3	9.6	11.3	11.9
3	21.2	21.5	20.2	17.3	19.2	18.1
4	17.9	23.0	21.3	21.6	20.2	21.7
5	24.7	19.6	19.6	17.2	17.5	17.9
6	21.5	20.1	23.0	27.8	26.9	26.5

Source: Author's calculations using data from the American Heritage Time Use Studies project and the Princeton Affect and Time Survey.

downtime) increased. These shifts, on balance, do not suggest significant improvements in affective experience for women over this entire forty-year time span.

The Activity-Based U-Index

In addition to classifying time use into categories, it is useful to summarize time allocation in a single welfare measure. Here a useful measure is the U-index, a misery index of sorts that measures the percent of moments spent in an unpleasant state. An unpleasant state is defined as one where a negative emotion (sadness, stress, or pain) strictly dominates any positive emotions ("happy" in this case). A desirable feature of the U-index is that it is ordinal at the level of an individual's feelings.[16]

16. See Kahneman and Krueger (2006).

Table 4. U-Indexes Based on Time Spent in Various Activities, 1965–66 to 2005[a]

Group	1965–66	1975–76	1985	1992–94	2003	2005
		U-index for men and women combined				
All	20.1	19.5	19.5	20.0	19.3	19.6
Men	20.9	20.4	20.1	20.2	19.6	19.9
Women	19.4	18.7	19.0	19.8	19.2	19.4
		Gender-specific U-indexes				
Men	20.2	20.1	19.2	18.8	18.7	19.0
Women	20.8	19.4	20.0	21.0	20.1	20.4

Source: Author's calculations using data from the American Heritage Time Use Studies project and the Princeton Affect and Time Survey.

a. A small number of missing and unclassified activities were assigned the mean U-index each year.

The U-index was first computed for each harmonized activity using the 2006 PATS data for a pooled sample of men and women. For example, the U-index was 27 percent during paid work, 8 percent during exercise, and 18 percent during television viewing. This means, for example, that during 27 percent of the time that the average person spends at work, the strongest emotion he or she experiences is a negative one. Next a weighted average U-index was computed, where the weights were the percent of awake time the average person spent in each activity. Formally, the weighted average U-index, denoted $\bar{U}_t$, for each year is

$$\bar{U}_t = \sum_i w_i \left(\sum_j p_{ijt} U_j \right) \bigg/ \sum_i w_i,$$

where w_i is the sample weight for individual i, p_{ijt} is the proportion of time that individual i spent in activity j in year t, and U_j is the U-index for activity j from the PATS.

The top panel of table 4 reports the results. The activity-based U-index shows very little trend over the last forty years for men and women combined, or for women as a group. For men, however, there has been a shift away from activities associated with unpleasant feelings. To put the estimates in context, the difference between the activity-based U-index on weekends and weekdays is about 3 percentage points. (With episode-level data, the weekend-weekday difference is about twice as large.) Thus, the one-point drop in the U-index from 1965–66 to 2005 is about one-third of the difference in unpleasant feelings associated with activities during the week and those on the weekend.

Although the U-index is highly correlated across activities for men and women, there are some notable differences in a small number of activities. Women, for example, find supervising/helping with homework and voluntary acts less unpleasant than do men. The bottom panel of table 4 uses the gender-specific U-indexes for each activity to compute the U-index separately for men and women using their actual time allocations. The results are generally consistent with those in the top panel, but noisier. The gender-specific weighted U-index displays no trend for women and has trended downward for men over the last forty years.

Table 5 presents results of regressions designed to control for possible changes in the age and education composition of the samples, as well as the survey day and month. The unit of observation is the individual respondent, and the dependent variable is the duration-weighted U-index for each respondent's activities on the survey day, or $\Sigma j\, p_{ijt} U_j$, where U_j is the U-index for activity j for men and women combined. The regression-adjusted estimates reveal a similar pattern: very little shift toward or away from unpleasant activities, on net, for women, but about a 1-percentage-point shift away from activities associated with unpleasant feelings for men since the mid-1960s.

Conclusion

This paper reports results of two new methods for classifying common activities and evaluating trends in time use. The results indicate that, for the population as a whole, changes in time allocation over the past forty years have *not* led to a decrease in the amount of time spent in activities associated with unpleasant feelings. For men, however, there has been a gradual shift away from activities associated with unpleasant feelings, primarily because of a downward trend in paid work and an upward trend in more "affectively neutral downtime" activities, such as "relaxing/doing nothing" and watching television. For women a decrease in household chores has been accompanied by an increase in market work and in time spent in neutral downtime activities.

Time spent in the most enjoyable and engaging forms of leisure activities has decreased for both men and women since the mid-1960s. This conclusion is seemingly at odds with that of Aguiar and Hurst, who write, "we have documented that the amount of leisure enjoyed by the

Table 5. Results of Regressions Explaining Activity-Based U-Indexes[a]

Independent variable	All respondents		Men		Women	
	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Intercept	20.905	0.224	21.108	0.356	19.862	0.279
Year = 1975–76	−0.518	0.074	−0.338	0.118	−0.689	0.094
Year = 1985	−0.544	0.070	−0.731	0.111	−0.363	0.088
Year = 1992–94	−0.031	0.071	−0.677	0.113	0.551	0.089
Year = 2003	−0.682	0.070	−1.255	0.110	−0.130	0.090
Year = 2005	−0.409	0.070	−0.950	0.109	0.110	0.089
Tuesday	−0.137	0.071	−0.122	0.113	−0.149	0.090
Wednesday	0.007	0.071	0.035	0.113	−0.023	0.090
Thursday	−0.194	0.071	−0.049	0.112	−0.325	0.090
Friday	−0.513	0.071	−0.553	0.112	−0.474	0.090
Saturday	−2.231	0.071	−2.599	0.113	−1.893	0.090
Sunday	−3.018	0.072	−3.431	0.113	−2.645	0.090
February	0.022	0.089	−0.128	0.140	0.158	0.113
March	0.203	0.092	−0.072	0.146	0.451	0.115
April	0.056	0.095	−0.179	0.149	0.243	0.121
May	−0.118	0.093	−0.272	0.146	0.004	0.117
June	−0.146	0.089	−0.302	0.142	−0.018	0.112
July	−0.406	0.111	−0.351	0.177	−0.470	0.139
August	−0.405	0.107	−0.473	0.171	−0.363	0.134
September	−0.018	0.096	−0.221	0.152	0.177	0.121
October	0.088	0.095	0.028	0.150	0.109	0.120
November	0.142	0.087	−0.031	0.140	0.313	0.109
December	0.102	0.089	0.082	0.140	0.092	0.113
Age	0.036	0.011	0.054	0.017	0.018	0.013
Age squared	−0.001	0.000	−0.001	0.000	0.000	0.000
Female	−0.921	0.038				
< High school diploma	−0.048	0.059	−0.025	0.093	−0.113	0.074
Some college	0.438	0.052	0.511	0.084	0.329	0.066
College degree	0.152	0.056	0.103	0.087	0.142	0.072
> College degree	0.009	0.075	−0.006	0.112	−0.054	0.099
R^2	0.104		0.115		0.084	
No. of observations	40,388		17,921		22,467	

Source: Author's regressions using data from the American Heritage Time Use Studies project and the Princeton Affect and Time Survey.

a. The dependent variable is the duration-weighted average U-index. Regressions are estimated by weighted least squares. Person weights have been normalized to sum to 1 in each sample. Weighted means (standard deviations) of the dependent variable are 19.7 percent (4.0) for all, 20.1 percent (4.3) for men, and 19.3 percent (3.8) for women. All explanatory variables except age and age-squared are dummy variables. The base year is 1965–66.

average American has increased substantially over the last forty years."[17] The difference stems from the fact that, in the present investigation, activities were assigned to groups according to respondents' own reports of their affective experiences.[18] The affect data suggest that people find television more pleasant than work and household chores, but less pleasant than socializing with friends and other activities classified in the most enjoyable cluster. Both Aguiar and Hurst and the present study find a substantial increase in time spent watching television.

Understanding why time spent watching television has increased so much in the last forty years, and what this shift implies for well-being, would seem to be a priority for future research. Three possible hypotheses, with varying implications, come to mind. One is that watching television has become more attractive, as a result of more variety in programming, better television sets, and greater flexibility because of Tivo and other forms of video technology. The second is that many people, perhaps especially women because of their increased time and effort at work, feel too tired much of the time to engage in more positive affective experiences such as socializing or entertaining. Third, some people may be seduced by the ease of watching television into allocating their free time suboptimally. Sorting out these hypotheses is left for future work, but it is worth noting that Robinson and Godbey's finding that the enjoyment score that people assign to the activity of watching television declined substantially from the mid-1970s to the mid-1990s weighs against the first explanation.[19]

Several other extensions of the analysis are possible. First, the social context of episodes could be taken into account in defining and classifying activities. The experience of commuting to work alone, for example, is likely to be different from that of participating in a carpool. Second, the range of emotional experiences associated with different activities can be extended beyond the six emotions considered here. Third, secondary activities associated with a main activity could be taken into account. For example, an episode spent eating while also supervising a child is likely to be a different experience than eating by itself. Fourth, paid work could be sub-

17. Aguiar and Hurst (2007, p. 999).
18. The trends in the underlying activities are quite similar in Aguiar and Hurst (2007) and the present paper, despite the fact that Aguiar and Hurst did not have access to the harmonized activity codes when they undertook their study. The robustness of the underlying trends is encouraging.
19. Robinson and Godbey (1997).

divided into different activities depending on the nature of the job or occupation. Fifth, one could experiment with assigning activities to more or fewer than six categories. The similarity of results based on the U-index method, which does not rely on aggregating activities, suggests, however, that the main results are not sensitive to the number of categories.

   Three limitations of the present analysis are also worth noting. First, the nature of certain activities may have changed substantially over time. Although this limitation applies to all studies of trends in time use at the activity level, it is particularly relevant here. For example, the experience of using a computer is undoubtedly quite different today than it was in earlier decades. Second, different people have different emotional responses to the same activities, and the mix of responses could be changing over time. Third, it is unclear how time spent sleeping should be factored into the U-index. If data were available to compute the U-index at the episode level for representative samples over time, the first two limitations could potentially be overcome.

APPENDIX

Table A1. Portion of Waking Day Spent in Each Main Activity, Women, 1965–66 to 2005
Percent of average day

Main activity	1965–66	1975–76	1985	1992–94	2003	2005
General or other personal care	1.52	0.20	0.79	0.32	0.25	0.09
Wash, dress, personal care	5.80	4.90	6.67	5.84	5.22	4.96
Personal medical care	0.06	0.11	0.04	0.06	0.44	0.64
Meals at work	0.74	0.69	0.72	0.00	0.05	0.03
Other meals and snacks	7.09	7.83	7.32	6.88	5.27	5.51
Main paid work (not at home)	14.32	14.07	15.83	21.10	19.51	19.13
Paid work at home	0.62	0.56	1.36	0.81	1.36	1.28
Second job, other paid work	0.14	0.17	0.26	0.01	0.64	0.62
Work breaks	0.51	0.34	0.18	0.06	0.02	0.02
Other time at workplace	0.23	0.19	0.16	0.00	0.00	0.00
Time looking for work	0.00	0.08	0.08	0.06	0.18	0.14
Regular schooling, education	0.19	0.30	0.33	1.01	0.61	0.43
Homework	0.30	0.42	0.48	0.77	0.79	0.70

(*continued*)

Table A1. Portion of Waking Day Spent in Each Main Activity, Women, 1965–66 to 2005 (*Continued*)

Percent of average day

Main activity	1965–66	1975–76	1985	1992–94	2003	2005
Short course or training	0.21	0.20	0.28	0.04	0.06	0.21
Other education or training	0.72	0.03	0.16	0.09	0.02	0.02
Food preparation, cooking	7.46	7.08	5.77	4.09	3.74	3.77
Set table, wash/put away dishes	3.71	2.26	1.87	0.68	1.23	1.22
Cleaning	5.94	5.76	4.52	4.79	3.97	4.58
Laundry, ironing, clothing repair	4.43	2.45	1.99	1.58	2.21	2.37
Home repairs, maintain vehicle	0.30	0.60	0.40	0.39	0.32	0.28
Other domestic work	1.58	0.59	1.49	1.40	1.26	1.24
Purchase routine goods	1.90	2.94	3.10	0.93	3.35	3.31
Purchase consumer durables	0.14	0.12	0.08	2.60	0.01	0.02
Purchase personal services	0.27	0.26	0.16	0.18	0.26	0.19
Purchase medical services	0.13	0.25	0.30	0.37	0.43	0.33
Purchase repair, laundry services	0.33	0.16	0.10	0.09	0.12	0.11
Financial/government services	0.06	0.14	0.20	0.12	0.09	0.10
Purchase other services	1.52	0.10	0.19	0.10	0.06	0.06
General care of older children	3.47	2.36	2.23	1.44	2.60	2.37
Medical care of children	0.09	0.12	0.07	0.02	0.16	0.17
Play with children	0.32	0.30	0.41	0.33	0.87	0.81
Supervise/help with homework	0.25	0.13	0.16	0.18	0.52	0.45
Read to/with, talk with children	0.24	0.36	0.18	0.06	0.38	0.43
Other child care	0.30	0.57	0.23	0.43	0.54	0.53
Adult care	0.67	1.10	0.51	0.51	1.65	1.35
General voluntary acts	0.45	0.29	0.43	0.05	0.91	0.78
Political and civic activity	0.09	0.04	0.01	0.00	0.02	0.00
Worship and religious acts	0.95	1.09	0.84	1.02	0.98	0.89
General out-of-home leisure	0.16	0.18	0.16	0.00	0.19	0.21
Attend sporting event	0.11	0.26	0.28	0.31	0.22	0.16
Theater, concert, opera	0.02	0.09	0.06	0.14	0.11	0.08
Museums, exhibitions	0.01	0.04	0.01	0.06	0.06	0.05
Café, bar	0.11	0.27	0.49	0.30	1.63	1.44
Parties or receptions	1.54	0.55	0.55	0.69	0.68	0.61
Sports and exercise	0.34	0.60	0.98	1.50	0.90	0.84
Walking	0.10	0.13	0.25	0.00	0.31	0.26

Table A1. Portion of Waking Day Spent in Each Main Activity, Women, 1965–66 to 2005 (*Continued*)

Percent of average day

Main activity	1965–66	1975–76	1985	1992–94	2003	2005
Cycling	0.00	0.03	0.02	0.00	0.03	0.02
Physical activity/sports with child	0.05	0.13	0.15	0.10	0.02	0.04
Hunting, fishing, boating, hiking	0.08	0.21	0.25	0.00	0.08	0.10
Gardening	0.27	0.55	0.36	0.26	0.82	0.80
Pet care, walk dogs	0.13	0.37	0.57	0.44	0.60	0.65
Receive or visit friends	4.97	4.78	2.94	4.01	4.62	1.81
Other in-home social games	0.46	0.69	0.71	0.56	0.58	0.80
Artistic activity	0.07	0.15	0.11	0.09	0.02	0.02
Crafts	1.24	1.44	0.76	0.55	0.11	0.17
Hobbies	0.04	0.04	0.02	0.03	0.02	0.03
Relax, think, do nothing	0.59	1.16	0.74	1.81	1.77	1.69
Read books	3.02	2.97	2.68	2.44	1.96	2.15
Listen to music (CDs etc.)	0.08	0.20	0.08	0.04	0.10	0.07
Listen to radio	0.28	0.19	0.23	0.11	0.07	0.11
Watch television, video	8.47	12.74	13.02	14.87	13.60	14.68
Writing by hand	0.74	0.23	0.39	0.72	0.19	0.15
Conversation, phone texting	1.60	2.20	3.37	1.42	0.92	3.45
Use computer	0.00	0.00	0.08	0.26	0.89	1.00
Imputed travel	0.00	0.05	0.00	0.00	0.33	0.03
Travel related to care	0.71	0.96	0.86	1.76	1.56	0.97
Travel related to work	1.35	1.37	1.97	2.26	1.68	1.66
Travel related to education	0.11	0.13	0.22	0.23	0.13	0.11
Travel related to consumption	2.13	2.06	2.33	2.22	2.50	1.26
Travel related to child care	0.55	0.53	0.53	0.36	0.77	0.72
Travel related to volunteering/worship	0.39	0.91	0.67	0.37	0.27	0.26
Travel related to leisure and other purposes	1.89	1.87	2.04	2.00	1.71	1.56
Missing/unclassified	1.34	2.79	2.18	1.66	0.47	2.92

Source: Author's calculations using data from the American Heritage Time Use Studies project.

Table A2. Portion of Waking Day Spent in Each Main Activity, Men, 1965–66 to 2005

Percent of average day

Activity	1965–66	1975–76	1985	1992–94	2003	2005
General or other personal care	0.93	0.19	0.74	0.34	0.25	0.17
Wash, dress, personal care	4.60	4.04	4.93	4.10	3.67	3.51
Personal medical care	0.06	0.04	0.02	0.04	0.31	0.60
Meals at work	1.55	1.18	0.90	0.00	0.05	0.06
Other meals and snacks	7.49	8.42	7.63	7.13	5.55	5.93
Main paid work (not at home)	34.98	30.28	25.57	29.27	28.44	27.41
Paid work at home	0.97	1.76	2.62	1.23	1.54	1.89
Second job, other paid work	0.96	0.71	0.54	0.06	1.00	0.96
Work breaks	1.16	0.60	0.27	0.08	0.03	0.03
Other time at workplace	0.68	0.40	0.35	0.00	0.00	0.00
Time looking for work	0.00	0.16	0.12	0.10	0.30	0.15
Regular schooling, education	0.32	0.67	0.64	1.23	0.64	0.50
Homework	0.73	0.76	0.93	0.93	0.68	0.90
Short course or training	0.26	0.25	0.20	0.03	0.03	0.09
Other education or training	0.29	0.09	0.12	0.07	0.04	0.00
Food preparation, cooking	0.84	1.03	1.44	1.52	1.42	1.42
Set table, wash/put away dishes	0.35	0.22	0.38	0.14	0.33	0.30
Cleaning	0.94	1.79	2.13	2.54	1.88	1.89
Laundry, ironing, clothing repair	0.11	0.10	0.26	0.30	0.42	0.45
Home repairs, maintain vehicle	0.99	1.75	1.80	1.64	1.49	1.47
Other domestic work	0.79	0.72	1.35	1.13	0.88	0.84
Purchase routine goods	1.05	1.31	1.69	0.44	2.17	1.95
Purchase consumer durables	0.18	0.15	0.10	1.24	0.03	0.01
Purchase personal services	0.09	0.05	0.06	0.04	0.06	0.06
Purchase medical services	0.17	0.14	0.19	0.21	0.24	0.28
Purchase repair, laundry services	0.25	0.13	0.15	0.18	0.13	0.11
Financial/government services	0.04	0.13	0.16	0.10	0.08	0.07
Purchase other services	1.02	0.11	0.23	0.10	0.05	0.04
General care of older children	0.40	0.48	0.38	0.25	0.83	0.84
Medical care of children	0.00	0.02	0.01	0.00	0.05	0.01
Play with children	0.46	0.17	0.23	0.20	0.60	0.54

Table A2. Portion of Waking Day Spent in Each Main Activity, Men, 1965–66 to 2005 (*Continued*)

Percent of average day

Activity	1965–66	1975–76	1985	1992–94	2003	2005
Supervise/help with homework	0.08	0.05	0.04	0.05	0.23	0.17
Read to/with, talk with children	0.06	0.11	0.08	0.07	0.12	0.12
Other child care	0.11	0.13	0.06	0.15	0.25	0.25
Adult care	0.47	0.91	0.54	0.40	1.22	1.13
General voluntary acts	0.21	0.24	0.26	0.10	0.72	0.67
Political and civic activity	0.10	0.02	0.00	0.03	0.00	0.05
Worship and religious acts	0.59	0.76	0.54	0.65	0.74	0.57
General out-of-home leisure	0.03	0.08	0.19	0.00	0.22	0.17
Attend sporting event	0.14	0.30	0.28	0.40	0.26	0.29
Theater, concert, opera	0.05	0.08	0.09	0.06	0.09	0.16
Museums, exhibitions	0.02	0.05	0.03	0.03	0.06	0.01
Café, bar	0.66	0.48	0.83	0.78	1.67	1.65
Parties or receptions	1.40	0.59	0.61	0.61	0.62	0.52
Sports and exercise	0.72	1.24	1.75	2.21	1.39	1.36
Walking	0.16	0.19	0.26	0.00	0.23	0.22
Cycling	0.00	0.03	0.03	0.00	0.05	0.07
Physical activity/sports with child	0.04	0.07	0.10	0.04	0.04	0.07
Hunting, fishing, boating, hiking	0.52	0.63	0.99	0.00	0.53	0.50
Gardening	0.16	0.38	0.61	0.33	1.39	1.64
Pet care, walk dogs	0.06	0.34	0.52	0.40	0.45	0.47
Receive or visit friends	3.29	3.36	2.50	3.60	3.86	1.63
Other in-home social games	0.54	0.52	0.51	0.51	1.00	1.06
Artistic activity	0.11	0.05	0.09	0.03	0.02	0.00
Crafts	0.01	0.22	0.03	0.04	0.18	0.13
Hobbies	0.28	0.32	0.30	0.04	0.04	0.06
Relax, think, do nothing	0.31	1.21	0.77	1.74	1.75	1.93
Read books	3.46	2.61	2.42	2.44	1.55	1.44
Listen to music (CDs etc.)	0.10	0.42	0.13	0.08	0.26	0.32
Listen to radio	0.44	0.28	0.33	0.24	0.12	0.13
Watch television, video	11.21	12.77	14.55	16.41	16.08	17.25
Writing by hand	0.27	0.12	0.23	0.60	0.12	0.11
Conversation, phone texting	0.99	1.53	2.05	0.73	0.44	2.69
Use computer	0.00	0.00	0.17	0.58	1.24	1.25
Imputed travel	0.00	0.04	0.01	0.00	0.24	0.03
Travel related to care	0.97	1.48	1.08	1.83	1.66	1.09
Travel related to work	3.68	3.19	3.45	3.35	2.86	2.69

Table A2. Portion of Waking Day Spent in Each Main Activity, Men, 1965–66 to 2005 (*Continued*)

Percent of average day

Activity	1965–66	1975–76	1985	1992–94	2003	2005
Travel related to education	0.19	0.27	0.17	0.22	0.15	0.09
Travel related to consumption	1.63	1.41	1.86	1.59	2.12	0.95
Travel related to child care	0.28	0.21	0.23	0.11	0.32	0.26
Travel related to volunteering/worship	0.37	0.81	0.62	0.35	0.24	0.18
Travel related to leisure and other purposes	2.06	1.97	2.58	2.35	1.79	1.71
Missing/unclassified	1.60	2.67	2.00	2.23	0.47	2.47

Source: Author's calculations using data from the American Heritage Time Use Studies project.

References

Aguiar, Mark, and Erik Hurst. 2007. "Measuring Trends in Leisure: The Allocation of Time Over Five Decades." *Quarterly Journal of Economics* 122, no. 3: 969–1006.

Becker, Gary S. 1965. "A Theory of the Allocation of Time." *Economic Journal* 75, no. 299: 493–517.

Dow, Gregory K., and F. Thomas Juster. 1985. "Goods, Time, and Well-Being: The Joint Dependence Problem." In *Time, Goods, and Well-Being,* edited by F. Thomas Juster and Frank P. Stafford. University of Michigan Press.

Gershuny, Jonathan, and Brendan Halpin. 1996. "Time Use, Quality of Life and Process Benefits." In *In Pursuit of the Quality of Life,* edited by Avner Offer. Oxford, U.K.: Clarendon Press.

Gronau, Reuben. 1977. "Leisure, Home Production and Work: The Theory of the Allocation of Time Revisited." *Journal of Political Economy* 85, no. 6: 1099–1123.

Juster, F. Thomas. 1985. "Preferences for Work and Leisure." In *Time, Goods, and Well-Being,* edited by F. Thomas Juster and Frank P. Stafford. University of Michigan Press.

Kahneman, Daniel, and Alan Krueger. 2006. "Developments in the Measurement of Subjective Well-Being." *Journal of Economic Perspectives* 20, no. 1: pp. 3–24.

Kahneman, Daniel, and others. 2004. "A Survey Method for Characterizing Daily Life Experience: The Day Reconstruction Method." *Science* 306, no. 5702: 1776–80.

Michelson, William. 2005. *Time Use: Expanding Explanation in the Social Sciences.* Boulder, Colo.: Paradigm Publishers.

Ramey, Valerie A., and Neville Francis. 2006. "A Century of Work and Leisure." Working Paper 12264. Cambridge, Mass.: National Bureau of Economic Research (May).

Robinson, John P., and Geoffrey Godbey. 1997. *Time for Life: The Surprising Ways Americans Use Their Time.* University Park, Pa.: Pennsylvania State University Press.

Russell, James A. 1980. "A Circumplex Model of Affect." *Journal of Personality and Social Psychology* 39, no. 6: 1161–78.

General Discussion

William Dickens argued that subjective rankings of the pleasurableness or unpleasurableness of activities have probably changed over time, although this is impossible to measure. What one can measure is the changing occupational and educational composition of the population. He wondered if breaking the results down by education or occupational category might illuminate the changing patterns of work and leisure.

Isabel Sawhill wondered about shifts in the types of work that people do over time and, since people spend about half of their waking hours at work during the workweek, how these shifts might affect their happiness.

Gary Burtless suggested that the most dramatic shifts in time use have probably occurred among people between the ages of sixty and seventy-two; some of Alan Krueger's earlier data on time use cover people between ages nineteen and sixty-four, which would miss these shifts.

Christopher Sims worried that people might think of utility as the time integral of the U-index, which could be misleading. For example, people may feel unhappy during activities such as training for a marathon or performing "unpleasant personal maintenance," but it is unlikely they would be happier overall if they did not do these things. Thus, he suggested, there may be something unmeasured that is connected to these activities and is part of overall welfare. If this is true, it could be dangerous to take policy steps to shift time use toward activities that appear more enjoyable. Krueger replied that the activities Sims described are, in effect, investments, and that policy actions certainly should take account of the returns to these investments. Some of the returns are reflected in the affect data, but some are not.

Robert Hall commented on television's contribution to well-being. Although people do not typically view television watching as an activity that makes them very happy, they also report self-control issues regarding

television: for example, they watch television instead of going to bed even though they realize that going to bed would actually make them happier.

Lawrence Katz wondered about the difference between average and marginal enjoyment. On average, socializing with friends might be more fun than watching television, but a person may have "marginal" friends with whom socializing is less fun than watching television. Katz also asked whether travel time to and from activities should be included in those activities or treated separately. For example, meeting friends involves traveling to and from a meeting place.

William Nordhaus wondered about the accuracy of historical time use reports. He also wondered how best to account for activities that are performed simultaneously, which are difficult to measure separately. He commented that paid work in the Bureau of Labor Statistics survey is a black box that should be investigated in the future. Krueger replied that the Princeton Affect and Time Survey asks follow-up questions about work episodes, such as whether the boss was present, whereas the BLS survey does not. Data from the PATS show that people feel stress at work when they spend time with their bosses, but not when they socialize with their friends, and they are typically less happy at work when they are alone. Krueger acknowledged that more research could be done on the relationship between working conditions and affect at work.

Krueger also noted that cultural and language factors affect reported life satisfaction measures, which makes them problematic for cross-cultural comparisons. For example, surveys in France indicate that people there are less likely to use the upper end of satisfaction or happiness scales, which makes them appear less happy than Americans, even though they typically work fewer hours and eat better food. The U-index, which compares the intensity of positive and negative emotions, is one way to overcome this problem.