

## TIME AWAY FROM WORK<sup>‡</sup>

# Time Use, Emotional Well-Being, and Unemployment: Evidence from Longitudinal Data<sup>†</sup>

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How do unemployed individuals allocate and experience their time? How does their time use and emotional experience change once they find a job? This article provides new evidence on the time use and emotional well-being of unemployed and employed individuals in the United States, using longitudinal data from a survey of unemployed workers in New Jersey. We find evidence that the time spent on home production activities drops sharply at the time of reemployment, with the magnitude of the shift in line with previous research using cross-sectional time use surveys (Burda and Hamermesh 2010; Krueger and Mueller forthcoming).<sup>1</sup> Leisure activities also decrease at the time of reemployment, though somewhat less than in cross-sectional time use data, partly because those finding a job were spending more time on job search activities in the weeks prior to reemployment.

We also investigate the relationship between unemployment and emotional well-being in connection with time use. Despite the fact that the unemployed spend relatively more time in leisure-related activities, we find that the unemployed enjoy these activities to a lesser degree

than their employed counterparts and thus, on an average day, report higher levels of sadness than the employed. Moreover, using the longitudinal data from the New Jersey survey, we find that the sadness decreases significantly at the time of reemployment.

### I. Data

We use data from the Survey of Unemployed Workers in New Jersey, where a group of 6,025 unemployed workers was interviewed each week for a period of up to 12 weeks from mid-October 2009 to mid-January 2010, and the long-term unemployed were surveyed for an additional 12 weeks, with interviewing ending in mid-April 2010. The respondents were invited each week to participate even if they had already found a job, which makes it possible to analyze their responses before and after reemployment. The survey was web-based and included a time diary, where respondents had to report their time use on the previous day and selected for each hour from 7 AM to 11 PM one or two activities from a list of 21 activities, comparable to the most frequently reported activities in the American Time Use Survey (ATUS). The Appendix in Krueger and Mueller (2011) describes the survey in detail. We also use data from the ATUS 2009–2010.

The main focus of this paper is to analyze the differences in time use and emotional well-being between employed and unemployed individuals. We define as unemployed those who have not yet accepted a job and have not been working for pay in the reference week. The definition of employment in the New Jersey survey is somewhat difficult, as workers in New Jersey may work part time and still be eligible for Unemployment Insurance (UI) benefits.

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<sup>1</sup>Taskin (2010) reaches a similar conclusion analyzing data from the Panel Study of Income Dynamics (PSID) from 1979 to 1986 based on weekly self-reported hours of housework.

Indeed, around 11 percent of the UI recipients in our sample reported that they were working for pay at least one hour in the previous week but had not accepted a job during the survey period. For this reason, it was difficult to establish whether and at what time unemployed workers started working on a part-time job and thus, we restrict our sample of employed individuals to those who accepted a full-time job (i.e., working more than 32 hours per week) in the sample period. We infer the start date of the job from administrative UI data based on the last week of UI benefit payment if the unemployed worker exited UI before exhausting benefits (we refer to this as “early UI exit”).<sup>2</sup> Because we want to avoid potential misclassifications, we exclude all observations where the respondent reported working for pay in the previous week but had not yet accepted a full-time job, and observations where the respondent reported that he or she had accepted a job before the start of the survey, but we did not have information on whether the job was part or full time. Note also that we restrict the sample to individuals aged 20 to 65 and limit responses to weekdays.<sup>3</sup> Our total sample size is 4,465 unemployed workers (22,087 diary days), of whom 271 accepted a full-time job during the sample period and exited UI early.<sup>4</sup> We also report the results with less restrictive sample criteria and find that our main results are robust to these alternative specifications.

## II. Home Production and Leisure before and after Reemployment

Columns 1–3 of panel A in Table 1 show the average minutes of time spent in different activities in the ATUS. As in the New Jersey survey, we restrict the employed to those who are employed full time and the unemployed to those who are eligible for UI benefits, because the

ATUS lacks data on UI benefit receipt, and we exclude weekend days and the hours in the time diary before 7 AM and after 11 PM.<sup>5</sup> Comparing the average minutes spent in different activities in the ATUS to the estimates from the New Jersey survey in columns 4–6, we find that they match the differences in time use between the employed and unemployed individuals surprisingly well. Most importantly, time spent working differs by just 13 minutes, and, thus, we are confident that our measure of employment captures the start date of the job well. The estimates from the New Jersey survey suggest a larger employment-unemployment gap in time use for child care and computer use and a smaller gap for watching TV than in the ATUS. Some of these discrepancies probably arise because of differences in the survey mode.<sup>6</sup> An additional reason for the differences could be that our survey participants were more likely to use a computer in their leisure time than watch TV. It is important, however, to highlight that when we aggregate time use into a broad measure of leisure (sleep, personal care, eating, leisure and socializing, and e-mail/internet/computer use) and home production (cooking/housework, care of others, and shopping and services), we find that the differences between the two surveys in the employment-unemployment gap are relatively small (29 minutes per weekday for leisure and just four minutes for home production).

The main advantage of the New Jersey survey is that it enables us to control for individual fixed effects. The results in column 7 of Table 1 show that including individual fixed effects matters very little for the differences in the time spent on home production (136 instead of 126 minutes per weekday). The employment-unemployment gap in time spent on leisure, however, is much smaller in the fixed effect estimation (117 instead of 222 minutes per weekday for the broad

<sup>2</sup> We exclude the week in which the person exited UI, since it is not clear if the person started the job in that week or the week after.

<sup>3</sup> Participants were invited for the online interview from Tuesday to Saturday to evenly represent all weekdays in the time diary. The survey allowed for interviews on Sunday and Monday, but we exclude these observations because of potential selection issues.

<sup>4</sup> We find a weekly job finding rate of around 1 percent. This is in line with the rate of early UI exits from mid-October 2009 to mid-March 2010, as reported in Table 12 in Krueger and Mueller (2011).

<sup>5</sup> Using data for the full 24 hours of the day, we find that the differences in time use between the employed and unemployed are very similar. The only exceptions are sleeping and work, where the differences in time spent between the employed and unemployed are –71 and 430 minutes instead of –32 and 401 minutes.

<sup>6</sup> The ATUS records only primary activities, whereas in the New Jersey survey respondents were given the opportunity to record up to two activities for each hour, which left it open whether these activities were exercised sequentially or simultaneously. When two activities were reported in a given hour, we allocate 30 minutes to each.

TABLE 1—DIFFERENCE IN TIME USE AND EMOTIONS BETWEEN THE EMPLOYED (E) AND UNEMPLOYED (U)

	ATUS (weekdays, 7AM–11PM, 2009–10)			New Jersey survey (pooled cross-section)			New Jersey survey (removing individual fixed effects)
	E	U	E – U	E	U	E – U	E – U
	<i>Panel A. Time use, by activity, in minutes per weekday</i>						
Sleep	88	120	–32***	57	102	–45***	–31*
Personal care	28	28	0	34	40	–6	2
Eating	60	57	3	70	72	–1	14**
Work	412	11	401***	395	8	388***	391***
<i>of which: income generating activities</i>	1	6	–5	NA	NA	NA	NA
Job search	0	56	–55***	5	70	–65***	–101***
Education	4	22	–18***	8	32	–24***	–20**
Cooking/housework	62	147	–85***	46	111	–65***	–74***
Care of others	26	59	–34***	28	81	–53***	–54***
Shopping and services	20	31	–12***	9	17	–9***	–7
Leisure and socializing	165	320	–155***	129	245	–115***	–65***
<i>of which: TV</i>	98	190	–92***	58	110	–52***	–50***
<i>of which: reading/writing</i>	9	14	–5	9	26	–17***	–9**
<i>of which: exercising</i>	12	21	–9**	8	17	–10***	–12*
E-mail/Internet/computer use	8	17	–9***	30	84	–54***	–38***
Volunteer, religious, and civic activity	8	12	–3	NA	NA	NA	NA
Commuting/travel	71	55	16***	108	40	68***	48
Other	9	27	–17***	39	58	–19	–65
<i>Panel B. Emotions (0 = not at all; 6 = extremely strong)</i>							
Happy	4.06	3.97	0.09	3.67	3.24	0.43	0.95*
Sad	0.63	1.12	–0.49**	0.70	1.34	–0.65***	–0.61***
Stressed	1.93	1.98	–0.05	1.35	1.89	–0.54***	–0.64*
Pain	0.76	1.36	–0.60**	NA	NA	NA	NA
Tired	2.44	1.99	0.45**	NA	NA	NA	NA
Meaningful	4.37	4.34	0.03	NA	NA	NA	NA

*Notes:* Columns 1–3 show the raw averages of time spent and emotions from the ATUS 2009–2010 and the well-being module of the ATUS 2010. To make the sample comparable to the New Jersey survey, weekends and hours in the diary before 7 AM and after 11 PM were excluded from the sample. Columns 4–6 show the raw averages of time spent and emotions from the New Jersey survey, and column 7 shows the differences in time use and emotions controlling for individual fixed effects.

\*\*\*Significant at the 1 percent level.

\*\*Significant at the 5 percent level.

\*Significant at the 10 percent level.

measure). The counterpart for the smaller change in leisure time at the time of reemployment is a larger difference in time spent on job search and travel, which indicates that those searching more are more likely to leave unemployment. Note, however, that this selection effect is specific to the reemployment margin, as the time spent on job search should affect the probability of exiting from unemployment, but not the probability of entering unemployment. Figure 1 also shows the time use in the weeks before and after reemployment, removing individual fixed effects. Home production and leisure drop sharply at the time of reemployment, in line with the numbers presented in Table 1. The figure also suggests that

the time spent on home production does not change much over the spell of unemployment, as there is no clear trend in the weeks before reemployment. To investigate this further, we regressed the time spent on home production activities on the duration of unemployment and individual fixed effects. We find a negative and insignificant coefficient on the duration of unemployment. This suggests that the unemployed have passed the point of diminishing marginal productivity in activities such as cooking, housework, and child care already at the beginning of the spell of unemployment.

It is useful to express the change in the time spent in home production and leisure as a

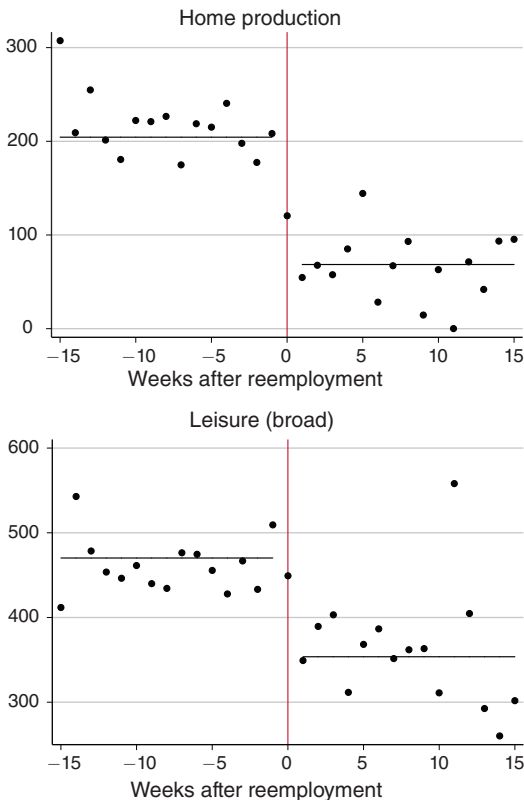


FIGURE 1. TIME SPENT ON HOME PRODUCTION AND LEISURE ACTIVITIES, IN MINUTES PER WEEKDAY, BEFORE AND AFTER REEMPLOYMENT

*Notes:* The solid lines show the average time use before and after reemployment, whereas the dots show the estimates for each week. Individual fixed effects are removed from all estimates in the figure. Home production activities are defined as: cooking/housework, care of others, and shopping and services. Leisure activities (broad) are defined as: sleep, personal care, eating, leisure and socializing, and e-mail/Internet/computer use.

percentage of the change in the time spent working: the decrease in the time spent in home production at the time of reemployment is around 35 percent of the change in the time spent working, and the same number for leisure is 30 percent.

As a robustness check, we use as an alternative measure of the employment status a question in the survey which asked the respondent whether he or she was working for pay for at least one hour during the past week. This definition should include transitions from unemployment to both part-time and full-time jobs.

Controlling for individual fixed effects, we find that the increase in time spent on working is 123 minutes compared to 388 minutes above, which confirms the observation above that part-time work is widespread among the UI recipients in New Jersey. Note, however, that when we compute the change in home production and leisure time as a percentage of the change in working time, we find that time spent in home production increases by 29 percent, and time spent in leisure increases by 53 percent (both effects are significant at the 1 percent level). This suggests some nonlinearity in the change of leisure at the time of reemployment, as with smaller changes in time spent on market work, time spent on leisure activities increases more in percentage of the change in time spent working.

### III. Emotional Well-Being before and after Reemployment

With data from the New Jersey survey and data from the well-being module of the ATUS 2010, we can evaluate how the subjective well-being differs between employed and unemployed individuals in connection with their time use. Both surveys randomly sampled three episodes in the time diary and asked the participants to rate their emotions during that episode on a scale from 0 to 6, where 0 means that the person did not experience that feeling at all and 6 means that the feeling was extremely strong.<sup>7</sup> Both surveys asked the respondents to rate their feelings happy, sad, and stressed, and the well-being module of the ATUS asked in addition the emotions in pain, tired, and meaningful.<sup>8</sup>

Table 2 shows the average ratings of the emotion sad of the employed and unemployed during specific activities of the day in the ATUS sample.<sup>9</sup> The unemployed are significantly sadder during leisure time, which could be due to the low amount of income the unemployed

<sup>7</sup> In the New Jersey survey, in addition to the three random episodes, one episode of job search was selected.

<sup>8</sup> For details on the well-being module of the ATUS 2010, see: [www.krueger.princeton.edu/data/ATUS/ATUSWellbeingFiles.html](http://www.krueger.princeton.edu/data/ATUS/ATUSWellbeingFiles.html).

<sup>9</sup> To increase the sample size, we included those individuals who are not eligible for UI benefits in the unemployed and part-time workers in the employed, and we also included weekend days. See also the online Appendix Table, which shows the results for all emotions during specific episodes of the day.

TABLE 2—DIFFERENCE IN THE EMOTION SAD BETWEEN THE EMPLOYED (E) AND UNEMPLOYED (U), BY TIME USE CATEGORY

	E	U	E - U
Personal care	2.32	2.85	-0.53
Eating	0.42	0.52	-0.10
Work	0.72	0.00	0.72***
<i>of which: income generating activities</i>	0.15	0.00	0.15*
Job search	2.51	1.97	0.55
Education	0.99	0.63	0.35
Cooking/housework	0.53	0.69	-0.16
Care of others	0.30	1.28	-0.97*
Shopping and services	0.49	1.66	-1.17**
Leisure and socializing	0.55	1.02	-0.47***
<i>of which: TV</i>	0.63	1.01	-0.38*
<i>of which: reading/writing</i>	0.41	1.41	-1.00**
<i>of which: exercising</i>	0.38	0.84	-0.46
E-mail/Internet/computer use	0.58	0.40	0.18
Volunteer, relig. and civic act.	0.69	0.94	-0.25
Communting/travel	0.57	0.99	-0.42***
Other	0.65	0.23	0.41**
Total	0.61	0.93	-0.32***

Notes: The authors' estimates with the ATUS 2010 well-being module. We used the ATUS labor force recode to define employment status.

- \*\*\*Significant at the 1 percent level.
- \*\*Significant at the 5 percent level.
- \*Significant at the 10 percent level.

have to spend on leisure activities, to diminishing marginal utility of leisure, or because the unemployed have time to think about their predicament, especially when they are watching TV.<sup>10</sup> The unemployed also feel sadder when shopping and obtaining services, probably because they are reminded of the many things they can no longer afford to purchase. Interestingly, the unemployed feel much less sad when they engage in work activities, which are mostly income generating activities such as hobbies and musical performances. These work-related activities, however, absorb a very small share of the average day of the unemployed.

Panel B of Table 1 shows the average emotions over the course of the entire day. The unemployed in the ATUS express higher levels of sadness and more pain than their employed counterparts, but also less tiredness. No difference is found for the emotions happy and stressed. This might explain why Knabe et al. (2010), based on

<sup>10</sup> We report a similar finding in Krueger and Mueller (2008) based on a smaller sample.

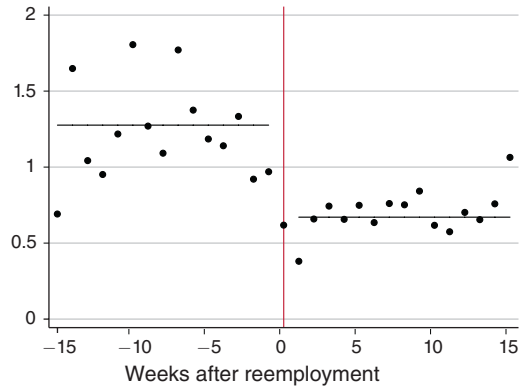


FIGURE 2. THE EMOTION SAD, BEFORE AND AFTER REEMPLOYMENT

Note: The solid lines show the average emotion before and after reemployment, whereas the dots show the estimates for each week. Individual fixed effects are removed from all estimates in the figure.

a survey of long-term unemployed in Germany, found no differences in emotional well-being between the employed and unemployed, as they did not include the emotions sad and in pain in their survey. We find similar results in the New Jersey survey (columns 4–6), with the exception that the employed in New Jersey appear less stressed. The fixed effects estimates (column 7) yield similar results, but the difference in happiness becomes significant at the 10 percent level. Note that some of these effects could be of temporary nature, as the first couple of weeks back to work might be a big relief from the stress and anxiety related to the experience of unemployment and job search. This is, however, unlikely to be true for the effect of reemployment on sadness, because it holds both in the New Jersey survey as well as the ATUS, which covers a representative sample of employed and not just those who recently became reemployed. This conclusion is also supported by Figure 2, which shows no clear trend in sadness over the 15 weeks after reemployment. One open question remains whether emotional well-being increases instantly to the preunemployment level or there are permanent scarring effects as found in studies of panel data of global evaluations of subjective well-being (Clark et al. 2008).

We also computed the corresponding statistics for a different definition of employment (working for pay for at least one hour in the past week) with the New Jersey survey. We find that the

employed tend to be happier (by 0.25 points), less sad (by 0.29 points), and less stressed (by 0.15 points). All these differences are significant at the 1 or 5 percent level. The smaller coefficients, however, suggest that the biggest gains in emotional well-being are concentrated among those who start a full-time job. Finally, we find that the share of those who report being satisfied or very satisfied with life increases by 25 percentage points at the time of starting a full-time job and by 7 percentage points in weeks working for pay for at least one hour (both significant at the 1 percent level), indicating that the changes in emotional well-being align well with changes in global evaluations of subjective well-being.

#### IV. Conclusions

We shed new light on the experience of unemployment, by studying diary data on time use and emotional well-being of unemployed workers in the United States. The novel feature of our analysis is the use of panel data before and after the time of reemployment. Controlling for individual fixed effects, we find that the time spent on home production activities, such as cooking, housework, child care, and shopping, drops sharply at reemployment by around 35 percent of the increase in time spent working. This is consistent with previous research based on cross-sectional time use data.

Aguiar, Hurst, and Karabarbounis (2011) also show that around 30 to 40 percent of forgone market hours in recessions are allocated to home production activities. These numbers are similar to the drop in the time spent in home production activities at reemployment and thus, transitions from unemployment to employment (and vice versa) should lead to changes in the time use of the population as a whole, which are consistent with Aguiar, Hurst, and Karabarbounis. To gauge the importance of such transitions for changes in aggregate time use, consider the increase in the unemployment rate of 5.6 percentage points in the recent recession (from trough to peak). If the difference in time spent on home production between the employed and unemployed stayed constant over that period, this increase in the unemployment rate would generate an increase in home production hours of around 0.6 hours per week, which is more than half

of the increase in home production relative to trend in the recent recession. This suggests that fluctuations in aggregate unemployment are an important determinant of the changes in aggregate time use over the business cycle.

Lastly, we find that the unemployed are sadder compared to when they are employed. Our results are robust to the inclusion of individual fixed effects, and sadness drops sharply in the first weeks after reemployment, which is strong evidence against the hypothesis that the saddening effect of unemployment is driven by selection. Instead, unemployment takes an emotional toll, even during leisure-related activities.

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