

# **Time-Use, Unemployment, and Well-Being: An Empirical Analysis Using British Time-Use Data**

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PRELIMINARY VERSION!

We use nationally-representative data from the UK Time-Use Survey 2014/2015 to investigate how a person's employment status is related to time-use and cognitive and affective dimensions of subjective well-being. We find that unemployed persons report substantially lower levels of life satisfaction than employed persons. When looking at specific types of activities, the unemployed feel worse than the employed in most of the activities they engaged in. However, the employed consider working to be one of the least enjoyable activities. They also spend a large share of their time at work and with work-related activities, while the unemployed spend more time on leisure and more enjoyable activities instead. When looking at duration-weighted average affective well-being over the day, our results suggest that the benefit of having to spend less time at work outweighs the negative emotional effect of unemployment during leisure episodes, such that the unemployed experience, on average, more enjoyment during the day than the employed.

## **1. Introduction**

The economics of happiness has become a thriving area of empirical research in the last two decades with a central focus on revealing the impact of various socio-economic and political factors on subjectively perceived well-being. It is largely based on extensive surveys in which people are asked to evaluate how happy or satisfied they are and econometric tools which can be used on survey data to estimate the impact of socio-economic factors (e.g. income, health, marital status, or unemployment) on subjective well-being. While subjective well-being studies in economics have traditionally used life satisfaction as the main measure of well-being, more recently, and mainly due to improved data availability, also actually experienced emotions (affective well-being) has received more interest among economists.

Our study pays close attention to the relationship between labour market status and the multiple dimensions of subjective well-being (cognitive well-being and affective well-being). In particular, we analyse how the general life satisfaction and the affective enjoyment experienced during specific activities differs between employed and unemployed people.

Previous studies about the relationship between affective well-being and unemployment have produced conflicting findings. Knabe et al. (2010) conducted a survey among unemployed and employed persons in Germany, collecting data on time-use and emotions using the Day Reconstruction Method. They find that employed persons are more satisfied with their life than the unemployed and report more positive and less negative feelings when engaged in similar activities. Weighting these activities with their duration shows, however, that average emotional well-being does not differ between the two groups. Although the unemployed feel worse when engaged in similar activities, they can compensate this by using the time the employed are at work in more enjoyable ways. Krueger and Mueller (2012) analyse data from the American Time-Use Survey (ATUS), which has contained questions about emotional experiences since its 2010 wave, to compare the time-use and well-being of employed and unemployed persons. They also find that the unemployed feel worse during leisure activities than the employed. Contrary to Knabe et al. (2010), they find that the unemployed feel significantly worse, in particular sadder and in pain, than the employed also when calculating day-averages of emotional well-being. However, for some other emotions (happy, stressed), they find no differences between the two groups, and the employed feel more often tired than the unemployed.

In this paper, we use data from the latest wave of the UK Time-Use Survey (2014/2015), a nationally-representative survey of time-use and well-being in the UK. The UKTUS differs from the ATUS in two important aspects. First, the UKTUS contains data about self-assessed enjoyment for all reported activities, while the ATUS gathers information on only three randomly-chosen activities for each respondent. Second, the UKTUS asks respondents a broad question about their “enjoyment” of each activity, instead of separate questions for different emotions that are used in ATUS. While this comes at the cost of less detailed information, it has the advantage that “enjoyment” can be considered an individual aggregation of all emotions, so that researchers don’t have to apply somewhat arbitrary external aggregation methods (e.g. Net Affect or U-index).

Our empirical results show that the unemployed have substantially lower levels of life satisfaction than the employed in the UK. The unemployed spend more time alone and more time sleeping, watching TV, playing games, and looking for jobs than the employed, who spend more time working and commuting. The comparisons of enjoyment in different activities reveal that the unemployed feel less enjoyment in most activities (sometimes with statistical significance) than the employed. The employed feel worst when working. Over the entire day,

however, the unemployed are experiencing, on average, even more enjoyment than the employed. This result stands in stark contrast to the findings by Krueger and Mueller (2012), but is supportive of the findings by Knabe et al. (2010) that the unemployed are able to “have a good day” despite being dissatisfied with life. The analysis is then deepened by running regressions in which a number of control variables can be taken into account. This further analysis supports the general findings.

This paper is structured in five sections. In Section 2, we will provide a brief literature review on the relationship between employment status and subjective well-being, with a focus on its affective dimension. Section 3 contains the data description. The empirical results are presented in Section 4, and Section 5 concludes.

## **2. Literature Review**

Subjective well-being is a multidimensional concept. While cognitive well-being refers to a person’s own judgement of his or her quality of life, either in general or with respect to specific life domains; affective well-being captures people’s emotional experiences during the engagement in particular activities, i.e. at specific points in time.

Traditionally, happiness research in economics relied predominantly on the cognitive approach to well-being. Literally, “well-being” is defined as the state of a person being comfortable, healthy or happy (Oxford Dictionary). For example, Veenhoven (1991, 1993) and Blanchflower et al. (2004) describe happiness as the level at which, according to individuals’ judgements, they are satisfied with or favour their quality of life. Cognitive well-being is a psychological construct that people form when asked to evaluate their life in general, or certain aspects of it. To make such an evaluation implicitly requires choosing one’s own criteria for a good life and to compare them to one’s actual life achievements. Empirical data on cognitive well-being are obtained by directly interviewing respondents in large-scale social surveys, e.g. in the UK Time-Use Survey, cognitive well-being is measured by a life satisfaction question. Respondents are asked: “How satisfied are you with your life, all things considered?” and can answer on a numerical scale between 0 (‘not at all satisfied’) and 10 (‘completely satisfied’).

One of the most consistent findings of the happiness literature is that unemployment is detrimental to life satisfaction. Panel studies that observe the same people over longer periods of time have also shown that becoming unemployed substantially reduces life satisfaction. This loss in life satisfaction is much larger than what can be explained by the associated income loss (Clark and Oswald, 1994; Knabe and Rätzl, 2011a; Winkelmann and Winkelmann, 1998).

Furthermore, although it has been found that people's happiness fully adapts to positive as well as negative life events, i.e. the life satisfaction of a person returns to its original level shortly after a significant change at the occurrence of the event, unemployment is a noticeable exception. After losing a job, life satisfaction first drops substantially, then remains at this lower level and does not increase even when staying unemployed for long periods of time (Clark, 2006; Lucas et al., 2004). The life satisfaction of a formerly unemployed person is lower than that of a continuously employed person where unemployment leaves a "scar" even after the person re-enters the labour market (Clark et al., 2001; Knabe and Rätzel, 2011b). Unemployment of a person has also been found to affect the life satisfaction of his or her partner (Knabe et al., 2016) and of other people living in the same region (Clark, 2003; Clark et al., 2010; Shields et al., 2009). One explanation is that an increase in the unemployment rate typically increases anxiety of losing their current job among the employed, while making the cognitive well-being loss of the unemployed smaller as unemployment becomes more common and the unemployed deviate less from the social norm.

Contrary to the more global, cognitive construct of satisfaction with life in general, affective well-being reflects individuals' emotional situation on a moment-to-moment basis (momentary well-being). It measures how people feel and which emotions they experience at specific points in time. While responses to the life satisfaction question might suffer from various behavioural biases (Kahneman, 1999), momentary well-being measures the strength of people's emotions at specific points in time and does not require normative judgements of what should constitute a good or satisfying life. The most direct way to measure affective well-being is the Experience Sampling Method (ESM) introduced by Larson and Csikszentmihalyi (1983). The ESM is a real-time emotion-tracking method where respondents carry a specific technical device reminding them various times a day to stop and answer some questions about what they do, where and with whom they are, and how they feel. Even if methodologically the ESM could be seen as the "gold standard" to measure momentary well-being, it has some inevitable disadvantages. Conducting ESM on a large scale appears prohibitively costly with considerable burden on respondents. The ESM could skip some important events of the day due to its momentary sampling and disrupt the experience during activities when individuals have to stop and respond to the device.

A potential alternative to ESM is the Day Reconstruction Method (DRM), which has been introduced by Kahneman et al. (2004b). It extends traditional time-use studies with emotional reports. Respondents in DRM surveys are asked to first recall what they did on the day preceding the interview and reconstruct this day via a diary consisting of a time-ordered

sequence of episodes. For each episode, respondents describe what they did, where and whom they were with. In addition to traditional time-use surveys, the DRM asks respondents to also state for each episode how strongly they experienced each of a list of positive and negative emotions. Since the time gap between the interview and the reconstructed events is rather short, DRM reduces potential recall biases while profiling the time-use and flows of emotions over an entire day. Studies have shown that the emotions reported in the DRM correspond well to those measured using ESM (Kahneman et al., 2004b; Kahneman and Krueger, 2006). Hence, the DRM provides a more cost-efficient way to collect data on affective well-being than the ESM. With the diary time-use and affect data, there are several widely-applied aggregation methods to form a unidimensional affective well-being measure. The Net Affect by Bradburn (1969) is calculated as the difference in the average strength of all positive and all negative emotions in the survey. The U-Index (Kahneman and Krueger, 2006) measures the proportion of time during which the strongest emotion experienced by a person is a negative one. A simple and straightforward alternative to aggregation is to ask only one affective question for each episode – for example, “All things considered, how satisfied are you with this episode?” (White and Dolan, 2009) – which implicitly leaves the aggregation to the respondent. The measurements at episode level using Net Affect, U-Index or Episode Satisfaction can be temporally integrated over an entire day to obtain a measure of daily-basis “objective happiness” (Kahneman et al., 1997)

Although there is an extensive literature on the relationship between unemployment and cognitive well-being, only a few studies have looked into unemployment and affective well-being. These studies suggest that unemployment has two different effects on affective well-being. First, there is a *saddening effect* of being unemployed. When engaged in similar activities, the unemployed feel worse than the employed. Collecting their own DRM data with phone surveys in the US, Krueger and Mueller (2008) compare the emotional well-being of employed and unemployed persons during similar activities and find that the unemployed report feeling more sadness, stress and pain than the employed. The second main finding is that there is a *time-composition effect* because the unemployed and the employed differ in how they spend their time. In their first DRM study (with employed women in Texas), Kahneman et al. (2004a,b) find that positive feelings are strongest during leisure activities and when interacting with friends and family, while negative feelings prevail mostly during episodes of work and work-related activities. This finding has been confirmed by Krueger and Mueller (2008) with US data, by White and Dolan (2009) with British DRM data, and – more recently – by Bryson and MacKerron (2017) with ESM data collected via a smartphone app in Britain. Becoming

unemployed thus implies that people can substitute more enjoyable leisure activities for less enjoyable working time. This time-composition effect works against the saddening effect so that it is *a priori* unclear which of the two groups feels better over the course of the day.

Knabe et al. (2010) conduct a DRM survey in Germany with more than 1,000 respondents to collect data of daily time-use and emotional states. Their results show that unemployed persons declare lower levels of life satisfaction than the employed. They also find that employed people rank working and work-related activities among the least enjoyable activities but experience more positive feelings than the unemployed when engaged in similar activities. While these results are in line with previous research, their main finding is that the duration-weighted average emotional state of an unemployed person does not differ from that of an employed person. This result shows up for different aggregate measures of momentary experienced utility (Net Affect, U-Index, Episode Satisfaction). The unemployed seem to be able to compensate the affective well-being gap in similar activities by spending the time the employed have to spend on work and work-related activities in more enjoyable ways.

Krueger and Mueller (2012), when examining the first wave of the American Time-Use Survey's (ATUS) well-being module, find that the daily moods of respondents are substantially affected by their labour market status. The unemployed feel sadder than the employed not only when they engage in the same type of activities, but also on average over the entire day. This supports their earlier findings (Krueger and Mueller, 2008). They speculate about the reasons for this saddening effect, mentioning that the abundance of free time might lead the unemployed to thinking more about their situation or that the marginal utility of leisure might diminish with respect to the additional leisure time the unemployed have. However, they also find that the employed feel more often tired than the unemployed. Contrary to Knabe et al. (2010), Krueger and Mueller (2008, 2012) do not aggregate the strength of the different emotions to a unidimensional measure.

Dolan et al. (2017) use ATUS data (the same dataset as Krueger and Mueller, 2012, but later waves) to show that whether unemployment negatively affects subjective well-being depends on the applied well-being measure. They find that the unemployed have significantly lower cognitive well-being (Cantril ladder), but there is no differences in their reported experience of episodic happiness over the day. Average scores of negative affects (tired, stressed, sad, in pain) are even weaker among unemployed than among employed persons. Similar observations are made by Flèche and Smith (2017). They analyse French time-use data and find that negative

emotions are less intensive for unemployed men compared to employed men, measured by the U-Index, whereas they are similar for employed and unemployed women.

The relative scarcity of studies, and their often-contradictory findings, leaves plenty of room for further research. The recent availability of large-scale, nationally-representative surveys with affective well-being information opens the possibility to test the cross-country transferability of findings, to analyse why previous studies have obtained contradicting results, and to extend the analysis to deepen our understanding why cognitive and affective well-being might react so differently to unemployment.

### **3. Data description**

In this study, we use the UK Time-Use Survey (TUS) 2014/15 to investigate how unemployment relates to cognitive and affective well-being among the UK population. The UKTUS is a nationally-representative survey of how UK residents spend their daily time. It has been conducted in 2000/01 and 2014/15. In general, respondents are asked some questions about their socio-characteristics and life circumstances before filling out two time-use diaries (one weekday, one day on a weekend). For each diary day, they report all activities they engaged in, how long these lasted, what exactly they did and whom they were with.

The UK TUS 2014/15 was collaboratively collected by NatCen Social Research, the Center for Time-Use Research at the University of Oxford and the Northern Ireland Statistics and Research Agency. This large-scale survey comprises participating households from England, Scotland, Wales and Northern Ireland, and surveys randomly selected household members aged 8 or older. In total, the sample covers 4,239 household interviews with 9,388 individuals who reported on 16,550 diary days. In the 2014/15 wave, the UK TUS was extended with cognitive well-being questions in the individual questionnaire, measured by satisfaction questions over life on a 0-10 scale and questions of other specific life domains, e.g. level of being worthwhile or how happy felt yesterday, on a 1-7 scale. Two time-use diaries, one for week day and one for weekend day, would then be randomly distributed to respondents after their individual interview. Besides, a sub-sample of surveyed respondents had an affective well-being question in which they were enquired to rate, for each episode reported in the time-use diary, how much they enjoyed their time on a scale from 1 (“not at all”) to 7 (“very much”). The diary design of UK TUS 2014/15 can be considered as a slight modification of the DRM by Kahneman et al. (2004b). The affect question consists of only one single emotion (“enjoyment”) for each diary episode. Such question design implicitly leaves the aggregation of overall emotional

experiences to respondents and thus, reduces the need for researchers to aggregate separate emotions using, arguably rather arbitrary, aggregation mechanisms.

Since we are interested in the relationship between employment status and well-being, this study will not utilise the entire dataset, but restricts the analysis to the weighted data of time-use diaries with enjoyment questions completed by employed and unemployed adult respondents (where the classification of unemployment follows the ILO definition). Among 272,146 episodes reported by respondents who were given questionnaires with enjoyment questions, there are 33,240 events ineligible for affective well-being study due to missing self-reported enjoyment scores. These will be dropped from our affective well-being analysis, but remains in the investigation of time-use. The loss of observations led to incomplete diary days; however, the application of duration-based method over total waking time is not be affected by the non-identical length of diaries as long as non-responses are not systematic. We directly use the enjoyment rating for each episode reported in the time-use diaries of UK TUS 2014/15 as the emotional well-being measure. The episodic enjoyment scores are then duration-weighted over the entire day and further weighted across individuals being in employment and unemployment correspondingly. In the following, we will present and compare the descriptive statistics of our main working data to the representative data of the UK population.

Table 1 shows the descriptive statistics of diary data collected in UK TUS 2014/15. We consider the four subgroups of employed and unemployed persons in (1) the subsample of adult diaries which include enjoyment questions, and (2) the whole sample of all adult diaries, with or without employment questions, which represents the UK population. We apply ILO definitions to distinguish between employment and unemployment. We exploit the diary weight provided in the data, which allows balancing the sample for the non-response rate across subgroups as well as for months of the years and days of the week. After being weighted, months and days of the week in the data are uniformly distributed; and for each month and day of the week, the age/sex/Government Home Region distribution of the sample matches that of the population. Thus, the employed and unemployed in the sample (2) represent all employed and unemployed persons among the UK population.

Table 1: Descriptive Statistics

	(1)		(2)	
	E	UE	E	UE
<i>Mean</i>				
Age	41.34 (0.22)	34.04 (1.12)	41.25 (0.20)	33.70 (0.99)
Number of Children in Household	0.60 (0.02)	0.53 (0.07)	0.60 (0.01)	0.58 (0.07)
Number of Household Members	3.06 (0.02)	2.95 (0.12)	3.03 (0.02)	3.16 (0.12)
Monthly Net Household Income	5862 (689.8)	2463 (344.4)	5525 (588.0)	2230 (273.0)
Weekly Working Hours in Main Job	35.11 (0.22)	. .	34.98 (0.21)	. .
Unemployment Duration	. .	1413 (168.95)	. .	1510 (165.50)
Number of Diary Episodes	36.30 (0.22)	34.09 (1.09)	36.01 (0.20)	33.88 (0.94)
Episode Duration	39.67 (0.24)	42.24 (1.35)	39.99 (0.22)	42.50 (1.17)
<i>Percentage</i>				
<b>Gender</b>				
Male	52.17	54.31	52.65	55.13
Female	47.83	45.69	47.35	44.87
<b>Marital Status</b>				
Single (Never Married)	24.32	53.00	24.43	55.26
Married/Cohabiting	66.84	33.56	66.77	33.51
Divorced/Widowed	8.82	13.44	8.79	11.23
<b>Highest Qualification</b>				
Degree/Higher Education	50.93	34.34	50.29	30.81
A-Level/Equivalent	19.69	24.78	20.19	28.48
Secondary	23.24	30.43	23.39	30.46
Number Of Individuals	3599	161	4232	204
Number of Diaries	7195	321	8461	407
Number of Episodes	261204	10942	304675	13789

Notes: E: In Employment, UE: Unemployment. Household Income (British Pounds), Unemployment Duration (Days), Episode Duration (Minutes). Standard errors in parentheses.

(1) Weighted data of adult diaries with enjoyment questions

(2) Weighted data of all Adult diaries, i.e. representing adult population of the UK

In this study, our central focus is on the subsample of questionnaires with enjoyment questions to investigate how employment status is related to daily hedonic well-being. Within the relevant subsample, there are 3,599 employed and 161 unemployed individuals having completed 7,195 and 321 time-use diaries, respectively. The statistics take into account various demographical and socio-characteristics, i.e. age, gender, marital status, highest qualification achieved, household size (persons/household), number of children in household, monthly net household income (pounds), weekly working hours in the main job (of the employed), unemployment duration (of jobless persons), number of episodes per diary and episode duration (minutes). Table 1 shows either their mean value or their share in the sample.

Among UK adults in both samples, employed persons are generally older, have more children with at least double the net household income compared to unemployed persons. Married/cohabitating and more highly-educated individuals are more often in employment. In each considered subgroup, more than 50 per cent of respondents are male, while statistics of gender structure in the UK in 2014 indicate that the female-male ratio is, for the most part, larger than 1 from the age of 27 (Office of National Statistics, 2014). This could be due to the inflow immigration of women to the UK and/or the fact that women more often leave the labour force (temporarily) to become economically inactive.

Table 1 reveals that the subsample used in our study (1) and the representative data for the entire UK population (2) exhibit very similar characteristics. In both samples, the employed are, on average, about 41 years old and work for about 35 hours per week in their main job. Women constitute nearly 48 per cent of all respondents. Almost 67 per cent of all respondents are married/cohabitating. Slightly more than half of the employed have attended higher education institutions. Unemployed persons are younger (on average 35 years old) and have fewer children than the employed. Less than 34 per cent of unemployed respondents are married/cohabitating, while the rate of single and never married persons is about twice as large among the unemployed as among the employed.

Besides the broad similarities, there are moderate differences between the subsample of respondents who were asked enjoyment questions and the full sample with regard to the net household income, unemployment duration and the highest qualification. Respondents in the subsample with enjoyment questions report a higher mean monthly income (by fairly 200 – 300 pounds), have higher ratio of degree holders to the number of the unemployed while undergoing shorter mean unemployment duration by roughly 100 days relative to the average of UK adult representative data. However, these differences are insignificant.

## 4. Empirical Results

On the (weighted) time-use and affect data of UK TUS 2014/15, we apply several statistical techniques to analyse, measure and compare the differences in cognitive and affective well-being perceived by employed and unemployed persons. We start with a comparison of global well-being measures, i.e. measures that ask respondents to evaluate their overall life, between the employed and the unemployed. We then examine daily time-use patterns, differentiated by labour market status. A comparison of diurnal hedonic well-being, i.e. the duration-weighted enjoyment scores over the total waking time of the day, will then be made between the employed and the unemployed. Finally, we conduct regression analyses of cognitive well-being (life satisfaction) and affective well-being (daily average enjoyment score) dependent on employment status and a control set of socio-demographic characteristics. The regression analysis, on the one hand, validates our earlier results concerning daily affective well-being and on the other hand, investigates the impact of employment statuses on self-evaluated life satisfaction on the UK data. The obtained results can be discussed and compared to prior studies with data from the US (Krueger et al., 2012; Dolan et al., 2017), France (Fleche and Smith, 2017), Germany (Knabe et al., 2010) and for the employed in the UK (Bryson and MacKerron, 2017).

### 4.1. Global well-being measures

In Table 2, we show how the employment status is related to different cognitive well-being measures. In the UK TUS, there are three well-being questions that capture different aspects of people's overall evaluation of their life. The first question is about respondents' satisfaction with their life overall. A second question asks how much respondents feel that the things they do in their life are worthwhile. The third question is not about respondents' entire life, but only about the day before the interview. They are asked to rate how happy they felt yesterday overall. Since this question is asked about the day "overall", and without giving respondents sufficient time to recapitulate all events of the previous day (as they would do in the diary part of the study), we would consider this measure to belong to the group of cognitive well-being measures. The designated scale of life satisfaction is from 0 to 10, while the other cognitive measures are scaled between 1 and 7. Hence, they are converted into the 0-10 scale by linearly normalizing scores for convenient comparison and interpretation.

*Table 2: Global Well-Being Measures*

	<b>E</b>	<b>UE</b>	<b>Stat. sign. of the diff.</b>
Life satisfaction	7.65 (0.03)	6.55 (0.19)	***
"Overall, how happy did you feel yesterday?"	7.39 (0.05)	6.91 (0.30)	
"Overall, to what extent do you feel that the things you do in your life are worthwhile?"	7.78 (0.04)	7.04 (0.23)	***

*Notes:* E: employed, UE: unemployed. Significance level: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01  
Standard errors of means in parentheses. Employment status specified according to ILO definition.  
Except "Life Satisfaction", other measures are converted from a 1-7 scale to the 0-10 scale

A glance at all three measures shows that the cognitive well-being of the employed is higher than that of the unemployed. The largest gap between the two groups is found for the life satisfaction level, which is 1.11 and statistically significant at the 1% level. This corresponds to the general observation in the happiness literature that unemployment is detrimental to life satisfaction. A common explanation for this effect is that unemployment implies a deviation from the social norm, which encompasses the expectation that able persons should work for a living and should not depend on society for their support. Cognitive well-being depends strongly on how well one meets one's own and society's expectations and norms. Unemployment constitutes a norm deviation and thus reduces cognitive well-being (see Hetschko et al. 2014).

The subjective assessment of whether one is doing worthwhile things in life also implies a statistically significant difference of 0.75 points between employed and unemployed persons. This reflects well some previous findings, indicating that people in employment feel purposeful and that working is approached as a meaningful, instead of enjoyable, activity (White and Dolan, 2009). When asked to rate how happy one felt yesterday, the employed report on average lower scores than their assessments of life satisfaction, while the opposite holds for the unemployed. As a result, the gap between working and jobless persons in their evaluation how happy they felt yesterday is smaller and statistical insignificant. This points to the importance of the time frame. When evaluating one's life overall, it matters to what extent one has achieved certain life goals and how that compares to the achievements of others. Having a (good) job seems to belong to these desirable life goals. When asked to evaluate how happy one felt yesterday, one might still compare how one spent one's own day with what other did (or what one thinks they did). One might, however, also compare one's own previous day with the days before that or with a "typical" day in one's own present life. Since the employment status does

not change for most people within short time periods, it matters less for the comparison of a single day with other days. This might be a reason why the employment status does not seem to be strongly related to that particular well-being measure.

#### 4.2. Analysis of time-use data

Before looking into how individuals actually enjoy their time, we analyse the daily time allocation of employed and unemployed persons. Table 3 provides a comprehensive picture of typical time-use, differentiated by employment status, revealing how employed and unemployed persons allot their daily time to a range of activities.

With part-time employees included, an employed person on average spends 255 minutes (4 hours 11 minutes) per day working and 44 minutes commuting to work. The unemployed, instead, do not go to work and spend this time for other activities. According to Table 3, unemployed persons devote a statistically significant larger amount of time to leisure, i.e. sleeping, playing games, watching TV, computing and other mass-media. In each of these activities, they spent between a half and one hour longer than employed persons. The activities with the most noticeable differences between the two groups are all rather indolent kinds of leisure.

Job-seeking and studying/trainings take up, on average, 28 minutes of an unemployed person's day, but only 6 minutes for the employed. The considerable difference implies that most of the employed do not spend much time with on-the-job-search and/or that the ratio of the unemployed searching for job to the number of unemployed persons is higher than that among the employed. The unemployed do not seem to spend much more time on household management, cooking, personal care, reading, social life, etc. than the employed. These differences are mostly statistically insignificant.

The investigation of daily time-use implies a substantial difference in how time is allotted to a wide range of activities among employed and unemployed persons. While the employed go to work, the jobless have a lot more leisure time, spend more time looking for a job and more often attend study and training programs.

Table 3: Time-Use by Employment Status and Activities, Unconditional on Participating

	E	UE	E - UE	Sig. level
Sleeping	498 (2)	554 (9)	-56	***
Eating	78 (1)	80 (4)	-2	
Personal Care	55 (1)	57 (3)	-1	
Working/Employment-Related Activities	255 (3)	0 .	255	***
Breaks at Work	9 (0)	0 .	9	***
Commuting to Work	44 (1)	0 .	44	***
Job Seeking	1 (0)	28 (6)	-27	***
Study/Training	6 (1)	41 (9)	-34	***
Cooking/Baking	31 (1)	35 (3)	-5	*
Household Management/Shopping & Services	84 (1)	92 (8)	-8	
Gardening and Pet Care	15 (1)	15 (4)	-1	
Childcare	24 (1)	25 (5)	0	
Helping Household Members	6 (0)	9 (4)	-3	
Volunteer/Participatory Activities	6 (0)	13 (4)	-7	*
Social Life	44 (1)	45 (5)	-1	
Entertainment/Sport/Outdoor Activities	42 (1)	54 (7)	-12	*
Free Time Learning/Art & Hobbies	5 (0)	12 (3)	-7	**
Playing Games	10 (1)	42 (10)	-31	***
Computing & Other Mass-media	18 (1)	41 (7)	-23	***
Reading	12 (1)	14 (3)	-2	
TV/Video	117 (2)	177 (13)	-60	***
Radio/Music	3 (0)	11 (4)	-8	*
Travel (Other purposes)	54 (1)	70 (5)	-17	***
Other Time-Use	23 (2)	26 (5)	-3	

Notes: Standard error of the means in parentheses

### 4.3.Affective well-being by employment status

With the remaining observations, we perform a two-step analysis of emotional well-being: at the event level and at the day level. The former refers to comparing the average enjoyment scores reported by the employed and the unemployed when engaged in the same activities. The latter compares the temporal integral of momentary enjoyment over the whole day, which takes into account the relative time composition of different activities within the day.

*Table 4: Enjoyment Score Across Individuals by Employment Status & Activities*

<b>Activity</b>	<b>E</b>	<b>UE</b>	<b>E - UE</b>	<b>Sig. level</b>
Playing Games	6.22	6.17	0.05	
Entertainment/Sport/Outdoor Activities	6.17	6.14	0.03	
Social Life	6.15	5.92	0.23	*
Reading	6.02	5.77	0.26	
Eating	5.95	5.92	0.04	
Radio/Music	5.85	6.12	-0.28	
TV/Video	5.84	5.79	0.06	
Volunteer/Participatory Activities	5.80	6.18	-0.38	
Childcare	5.77	5.85	-0.09	
Gardening and Pet Care	5.73	5.73	0.00	
Free Time Learning/Art & Hobbies	5.66	5.74	-0.08	
Other Time-Use	5.52	5.31	0.22	
Computing & Other Mass-media	5.51	5.02	0.49	**
Helping Household Members	5.48	4.85	0.63	**
Breaks at Work	5.41	.	.	
Cooking/Baking	5.29	5.04	0.26	
Personal Care	5.27	5.32	-0.05	
Travel (Other Purposes)	5.11	5.06	0.05	
Household Management/ Shopping & Services	4.72	4.54	0.18	
Working/Employment Related Activities	4.63	.	.	
Study/Training	4.57	4.83	-0.26	
Commuting to Work	4.53	.	.	
Job Seeking	3.39	3.57	-0.18	
<b>Day-Average Enjoyment</b>	<b>5.28</b>	<b>5.44</b>	<b>-0.16</b>	<b>*</b>

*Notes:* E: employed, UE: unemployed. Significance level: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01

Table 4 reveals how much enjoyment the employed and the unemployed experience, on average, when engaged in similar activities. As we only consider jobless persons without any paid jobs in the group of the unemployed, the episodes of commuting to work, working and other working-related activities will be only observed among the employed. In the following,

we will analyse affective well-being across activities within each group, and then compare the results between employed and unemployed persons.

At an overview, both the employed and the unemployed tend to assign relatively high enjoyment scores to volunteering activities, sport and leisure, with scores mainly above 5.5, while being they do not seem to enjoy daily repeated tasks, e.g. household management. For both groups, playing games is among the most favourite things to do. The worst is job search, for which the average well-being score is reported to be 3.39 by the employed and 3.57 by the unemployed. Our results confirm what have been found by Krueger and Mueller (2012) with US data, where unemployed people are also feel particularly bad when looking for a job. Work-related activities (working and commuting) belong to the least enjoyable activities of the day for employed persons, with scores as low as 4.53. Employed persons feel best when playing games (6.22), whereas the unemployed report the highest average enjoyment scores when volunteering and or engaging in participatory activities (6.18).

Social life activities also belong to the most enjoyable times of the day. Compared to the employed, the unemployed do not experience as much enjoyment during socializing, i.e. 5.92 compared to 6.15, where the difference is significant at 10% level. Nonetheless, social life episodes are rated better by unemployed persons than many other entertainment and leisure activities, e.g. watching TV/Video (5.79), reading (5.77), gardening and pet care (5.73) or free-time learning and hobbies (5.74).

In line with the previous literature on the relationship between employment status and well-being, we find that the employed are enjoying most kinds of activities more than the unemployed. Whenever there is a statistically significant difference in enjoyment scores for particular activities in Table 4, the employed feel better than the unemployed. This has been called the *saddening effect* of being unemployed (Knabe et al. 2010). However, the differences are statistically insignificant for most activities, so we find only weak evidence for the *saddening effect* in the UK TUS data. The most noticeable gaps of enjoyment scores between two groups are during helping other household members (0.63 point gap) and during computing/mass-media use (0.49 point gap).

At the bottom of Table 4, we present the duration-weighted average enjoyment score over the total waking time. We find that, averaged over their entire day, the jobless experience even more enjoyment than the employed. The employed report an average enjoyment score of 5.28 over the day. This value is by 0.16 point higher, the difference being statistically significant at

the 10% level, for the jobless. What we find on the UK data is consistent with the findings by Knabe et al. (2010). Although the unemployed are dissatisfied with their life and, in general, do not enjoy particular daily activities as much as the employed enjoy the same activities, they are better off with respect to affective well-being when looking at the entire day and how they actually spend their time. This can be explained by the strength of emotional experiences and the duration that the persons experience it. The unemployed spend far more time on leisure and entertainment while the employed go to work, an activity that accounts for some of the worst hours of the day. The weak *saddening effect* is thus reversed by the stronger *time-composition effect*, resulting in a higher daily affective well-being experience of unemployed persons compared to the employed.

#### 4.4. Regression Analysis

In the preceding section, we compared mean enjoyment scores between the groups of the employed and the unemployed. Since the two groups differ not only in their employment status, but also in other socio-demographic characteristics (see Table 1), it is possible that the observed differences are caused by factors other than the employment status. To verify our results, we conduct regression analyses where we regress life satisfaction and daily enjoyment on employment status, while controlling for a set of socio-demographic variables.

We estimate a regression model with three different specifications. The baseline specification includes only a dummy variable indicating the person's employment status. The second specification is extended with various personal and sociodemographic characteristics, such as gender, marital status, education, age, household size and number of children. The final specification brings in the monthly net household income per capita. We adjust household income to the size of the household, using the modified OECD equivalence scale. The model is run separately for life satisfaction and day-average enjoyment score as dependent variables. Concerning the regression of daily enjoyment, we also differentiate weekday from weekend diaries and thus perform separate regressions for each type of diary day. Regression results are reported in Tables 5, 6 and 7.

##### *Life satisfaction*

The regression results of life satisfaction from Table 5 are in line with the literature and confirm our earlier descriptive findings: Unemployed people are dissatisfied with their life. The relationship between unemployment and life satisfaction is negative and statistically significant at the 1% level. The magnitude of the estimated coefficient becomes smaller (in absolute terms)

as control variables are added, changing from -1.105 in the baseline to -0.869 in the final specification. When controlling for various socio-demographic characteristics and household income, being jobless is associated with a level of life satisfaction that is almost 0.9 points smaller than that of a comparable employed person.

*Table 5: Regression Results: Life Satisfaction*

	<b>Life Satisfaction</b>		
	(1)	(2)	(3)
Unemployment	-1.105*** (0.197)	-1.053*** (0.195)	-0.869*** (0.201)
Female		0.120* (0.070)	0.135* (0.073)
Age		-0.096*** (0.015)	-0.111*** (0.016)
Age-Squared		0.001*** (0.00019)	0.0012*** (0.00021)
Married/Cohabiting		0.655*** (0.092)	0.695*** (0.095)
Degree/Higher Education		-0.041 (0.070)	-0.085 (0.073)
Number of adults in household		-0.008 (0.039)	0.004 (0.043)
Number of Children in Household		0.053 (0.038)	0.063 (0.039)
Equivalentized HH Income (in 1000 GBP)			0.0022*** (0.001)
Constant	7.651*** (0.036)	9.224*** (0.352)	9.438*** (0.371)
No. of Obs.	3048	3048	2814
R-Squared	0.02	0.05	0.05

*Notes:* OLS Regressions. Robust standard errors in parentheses

Significance level: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

We find a non-linear relationship between individuals' age and their level of self-evaluated life satisfaction. The respective relationship is U-shaped, where life satisfaction is decreasing in age in the early years, reaching a low around the late 40s, and then rising again in the latter years of life. Similar findings have been reported by other studies, e.g. Clark and Oswald (1994), Frey and Stutzer (2002), Di Tella et al. (2003), Blanchflower and Oswald (2008), Stone et al. (2010). Women and persons living with a partner, either being married or cohabiting, have a higher life satisfaction than comparable men or singles, respectively. Women tend to assess their life

satisfaction by 0.12 points higher than men. This difference rises to 0.135, being statistically significant at the 5% level, when household income is controlled for. Married/cohabitating persons are more satisfied with their life compared to others, shown by the positive (roughly 0.7) and highly significant coefficients in both specifications. While more children in the household or higher income are associated with higher life satisfaction, higher educational degrees and larger household sizes (more adults) are, *ceteris paribus*, negatively related to the assessment of global subjective well-being. These effects are rather small in size and not statistically significant. Household income per capita is, in line with previous literature, positively and highly significantly related to life satisfaction. However, the effect size is relatively small (satisfaction with life is 0.0022 point higher when equalized household income is 1,000 pounds higher).

Among all the regressors, the unemployment dummy has the largest effect on life satisfaction. This shows the importance of one's labour market status for the subjective evaluation of overall cognitive well-being. The observed negative relationship corresponds to the well-established empirical finding that unemployment causes people to be dissatisfied with their life.

### ***Diurnal affective well-being***

The regression results of daily affective well-being on employment status and various socio-demographic characteristics are presented in Table 6 and Table 7 corresponding to regressions at individual level and at individual-day level respectively. Concerning the former, we obtain one day-average emotional well-being measure for each individual by weighting within the individual the enjoyment levels of weekday and weekend diaries by 5:2. Referring to the latter, the diurnal enjoyment of respondents by weekday and weekend diaries will be separately regressed. Thus, there is no need to aggregate the two diary days by each individual into an average typical daily well-being that is balanced for days of the week. Although employment status of a person typically does not change in a short period of time (from weekday to weekend), the effect of being employed/unemployed on how a person enjoys his/her day could be largely different by days of the week, and so do other controls. Hence, a differentiation between weekday and weekend day and a comparison between regression outcomes at individual and at individual-day level would be sensible for our analysis.

*Table 6: Regression Results: Daily Affective Well-being at Individual Level*

	<b>Daily Enjoyment</b>		
	(1)	(2)	(3)
Unemployment	0.151*	0.126	0.168**
	(0.086)	(0.086)	(0.084)
Female		0.09**	0.086**
		(0.035)	(0.035)
Age		-0.014*	-0.015*
		(0.008)	(0.008)
Age-Squared		0.000185**	0.000206**
		(0.000088)	(0.000092)
Married/Cohabiting		-0.035	-0.015
		(0.041)	(0.042)
Degree/Higher Education		-0.089**	-0.095***
		(0.036)	(0.035)
Number of Adults in Household		-0.037*	-0.039*
		(0.020)	(0.021)
Number of Children in Household		0.026	0.019
		(0.021)	(0.022)
Equivalized HH Income (in 1000 GBP)			0.004
			(0.003)
Constant	5.238***	5.552***	5.576***
	(0.018)	(0.163)	(0.169)
No. of Obs.	3709	3709	3400
R-Squared	0.00	0.01	0.01

*Notes:* OLS Regressions. Robust standard errors in parentheses.

Significant level: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Regression results at individual level shown in Table 6 suggest that employment status is an important factor to the level of hedonic well-being gained by UK respondents in everyday life. Being unemployed is related to better assessment of enjoyment perceived on a day-to-day basis by 0.126 – 0.168 point. These coefficients are all positive, increasing in size and becoming significant at 5% level when income is also taken into account. Our earlier findings obtained by the comparison of means technique are, therefore, supported by the regression analysis controlling for different sets of socio-factors. Unemployment lowers people’s evaluation of global life satisfaction, meanwhile relates to better emotional experience on a daily balance.

Some control variables, including gender, age, education and number of adults in the household yield significant effects on the daily perceived well-being of individuals, while the others are insignificant. Being female increases the diurnal well-being by roughly 0.9 point with statistical

significance at 5% level. To our surprise, earning higher degrees, having a civil partner or having more adult members in the household do not make people experience their daily life better. These coefficients are negative, sometimes with highly significant level, for instance, coefficients of holding degrees/attaining higher education. Age has a U-shaped relationship to diurnal affective well-being, slightly significant at 10%. The daily average well-being is reduced with Age until people are around 40. It increases afterwards as people become older. Income has a small and insignificant impact on daily enjoyment perceived by individuals.

We will look further into how different personal and socio-characteristics are related to daily emotional experience of individuals by days of the week. Table 7 illustrates the regressions of daily enjoyment at individual-day level in which the effects of input variables are differentiated by weekday and weekend day. According to Table 7, all the specifications of weekday and weekend regressions indicate that unemployment is associated with better average assessment of subjective enjoyment. The coefficients of unemployment dummy vary between 0.175 and 0.208 for weekday and are significant at either 10% or 5% level. These coefficients are also positive for weekend regression, however, far smaller in size of effects and statistically insignificant. This indicates that the results we obtained earlier by comparing mean enjoyment scores of employed and unemployed persons as well as by running regression of experiential daily well-being at individual level are robust to controlling for third factors in a regression analysis. As we had seen in the descriptive analysis, working and employment-related activities are considered the least enjoyable activities for employed persons, and being unemployed allows the substitution of more entertaining activities for less unpleasant working hours. During working days, the unemployed obtain significantly higher level of day-average enjoyment than the employed, whereas the daily affective well-being is not significantly different for the two groups on weekends.

Our results suggest that gender and age matter for the duration-weighted affective well-being on weekdays, but we do not find a significant relation between enjoyment and these factors on weekends. On weekdays, women score significantly higher in diurnal well-being than men. Age has a small, but highly significant U-shaped relation with how people enjoy their day, similar to that on life satisfaction. Average daily affective well-being is decreasing with age before reaching the lowest point around 40 and going up again as people get older.

We do not find statistically significant relationships between living with a partner or having more adults in the households and daily enjoyment. Being better education is negatively related to daily enjoyment, both on weekdays and on weekends.

Table 7: Regression Results: Daily Affective Well-being at Individual-Day Level

	Daily Enjoyment					
	Weekday			Weekend		
	(1)	(2)	(3)	(1)	(2)	(3)
Unemployment	0.208** (0.092)	0.175* (0.092)	0.196** (0.092)	0.036 (0.079)	0.022 (0.080)	0.037 (0.079)
Female		0.126*** (0.035)	0.126*** (0.036)		0.037 (0.032)	0.044 (0.033)
Age		-0.024*** (0.008)	-0.027*** (0.008)		-0.008 (0.008)	-0.009 (0.008)
Age-Squared		0.00033*** (0.000)	0.00036*** (0.000)		0.00011 (0.000)	0.00012 (0.000)
Married/Cohabiting		-0.057 (0.043)	-0.047 (0.045)		0.001 (0.041)	0.023 (0.042)
Degree/Higher Education		-0.132*** (0.035)	-0.141*** (0.036)		-0.085*** (0.032)	-0.081** (0.034)
Number of Adults in Household		-0.014 (0.018)	-0.006 (0.019)		-0.017 (0.017)	-0.017 (0.018)
Number of Children in Household		0.045** (0.022)	0.033 (0.023)		0.008 (0.019)	-0.003 (0.020)
Equivalentized HH Income (in 1000 GBP)			0.00027 (0.0012)			-0.004*** (0.002)
Constant	5.181*** (0.018)	5.591*** (0.167)	5.660*** (0.172)	5.53*** (0.017)	5.72*** (0.163)	5.746*** (0.171)
No. of Obs.	3679	3679	3375	3685	3685	3380
R-Squared	0.00	0.02	0.02	0.00	0.00	0.01

Notes: OLS Regressions. Robust standard errors in parentheses.

Significance level: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

The number of children appears positively related to daily enjoyment during weekdays, whereas there does not seem to be any relationship on weekends. We find that the relationship between equivalized net household income and daily enjoyment goes in different directions on weekdays and weekends. The income variable is negative and highly significantly related to daily enjoyment on weekends, while showing a positive and statistically insignificant association with average affective well-being on weekdays. One explanation for this surprising finding could be that the people with higher income could be the employed who work overtime on the weekend instead of spending the complete free time to relax and recover. To be able to figure out the driving factors behind this finding, one needs to look into how income is related to the decision of time spent on different activities, and the level of enjoyment achieved associated with these exercises of time.

Overall, the regression analysis supports our descriptive finding that unemployment is reversely related to people’s cognitive and affective well-being. While employment is an important contributor to individuals’ subjectively perceived cognitive well-being (life satisfaction), its relationship with duration-weighted daily enjoyment seems to be negative. Similar differences are found for income. While higher household income is associated with higher life satisfaction, high-income individuals do not enjoy their days more than people with lower incomes during weekdays, and even less on weekends.

4.5. Correlations between well-being measures

In the following, we will examine the correlations between various cognitive and affective well-being measures more closely.

*Table 8: Correlations between Well-Being Measures*

	Life Satisfaction	Happiness Yesterday	Life Worthwhile	Daily Enjoyment
Life Satisfaction	1	-	-	-
Happiness Yesterday	0.51	1	-	-
Life Worthwhile	0.66	0.48	1	-
Daily Enjoyment	0.22	0.22	0.25	1

As shown in Table 8, there are positive pairwise correlations between all the well-being measures considered. However, the correlations of the daily enjoyment to other three cognitive measures are rather weak, valued either at 0.22 or 0.25. The strongest correlation is found between life satisfaction and people’s assessment whether they find that the things they do in their life are worthwhile. Life satisfaction is a cognitive measure that forms when people think

of what constitute a satisfying life and briefly review their life circumstances based on these abstract criteria. Thus, it is reasonable that the persons with more sense of purpose are likely to feel more satisfied with their life.

A moderate correlation can be found between how happy people state they were the day before the initial interview and their overall life satisfaction (0.51), or between yesterday's happiness and their statement how worthwhile the thing they do are (0.48). Concerning the measure reflecting how happy the person felt yesterday, it potentially consists of the actual experience of individuals yesterday and an assessment of how much they should be happy about it. This could be an explanation of its positive but weaker correlations between yesterday happiness to the other cognitive measures as well as affective measures.

Results in Table 8 suggest that average enjoyment is only weakly correlated with the more cognitive types of well-being assessments. Hence, the two types of well-being measurement seem to capture distinct dimensions of subjective well-being. Our finding that unemployment has opposite effects on affective and cognitive well-being thus emphasizes the need to examine both well-being dimensions separately.

## **5. Conclusion**

In this study, we investigate the relationship between employment status, time-use and subjective well-being, using the most recent wave of the national time-use survey of the UK (UK TUS 2014 – 2015). Our main findings indicate that employment status plays an important role for individuals' well-being. We support what have been found in previous studies by Knabe et al. (2010), Dolan et al. (2017), Fleche and Smith (2017). Unemployment is detrimental to global evaluative life satisfaction, but not to diurnal affective well-being. Jobless persons are worse off compared to employed persons during the engagement of nearly all the daily activities, which implies the existence of a saddening effect of being unemployed. However, the observed well-being differences are mainly statistically insignificant, so that the evidence for the saddening effect is rather weak. Working is reported by the employed to belong to one of the least enjoyable experiences of the day. When considering total waking time, the employed spend, on average, more than 4 hours per day at work, while the unemployed can allot this amount of time to more relaxed and enjoyable activities, e.g. playing games or watching TV. We find that this time-composition effect is strong enough to compensate and reverse the saddening effect, resulting in a higher duration-weighted diurnal affective well-being of the unemployed.

This study contributes to understanding the relationship between employment status and well-being, with empirical evidence from the nationally representative UK data. Our findings suggest that unemployment makes people dissatisfied with their life. This could be the consequence of internal pressure, e.g. self-actualisation, or external pressure, e.g. social norms. However, when looking at everyday life, we do not find a negative effect here. If anything, the unemployed are able to enjoy their days more than the employed.

In future research, one could examine more thoroughly the contributions of several aspects to individuals' experienced utility. Whether or not the saddening effect directly originates from being unemployed and the role played by social contacts in mediating the relationship between employment status and subjective well-being are some research questions that could be solved with affect data. This opens rooms for future research in labour market experiences and happiness.

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