IOE, Faculty of Education and Society

# Millennium Cohort Study: Age 14 sweep (MCS6)

## Time Use Diary data

User Guide (Version 2)

August 2025

CENTRE FOR LONGITUDINAL STUDIES

UKRI Economic and Social Research Council

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## How to cite this guide

Mylona E., Lamote de Grignon Perez J., Rosenberg R., Sanchez-Galvez A., Fitzsimons E. (2025) *Millennium Cohort Study age 14 sweep (MCS6): Time Use Diary User Guide (Version 2)*. London: UCL Centre for Longitudinal Studies.

## How to cite the data

You should cite the data and acknowledge CLS following the guidance from cls.ucl.ac.uk/data-access-training/citing-our-data/

## Centre for Longitudinal Studies

Centre for Longitudinal Studies (CLS)

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## Funding

This work has been supported by the Economic and Social Research Council, under the Centre for Longitudinal Resource Centre award 2022-2025 ES/W013142/1 and the ESRC Cross-investment Grant *"Children's Time UseDiaries: Promoting Research, Sharing Best Practice, and Evaluating Innovations in Data Collections Internationally"* (Award Number: ES/F037937).

This document is available in alternative formats. Please email the Centre for Longitudinal Studies at clsdata@uck.ac.uk

# Contents

# About the Millennium Cohort Study

The Millennium Cohort Study (MCS) is a longitudinal birth cohort study, following a nationally representative sample of approximately 19,000 people born in the UK at the turn of the century.

Through the study, we have captured rich information about the different aspects of cohort members' lives, from birth to childhood and adolescence, and we are continuing to keep up with them now they are adults.

As a multidisciplinary study, MCS is used by researchers working in a wide range of fields. Findings from MCS have influenced policy at the highest level, and today the study remains a vital source of evidence on the major issues affecting young people's lives.

# About this user guide

This user guide provides an introduction to the time use diaries (TUD) data collected during Wave 6 of the Millennium Cohort Study. It describes the three modes of diary data collection (web, paper and app), the raw datasets parsed in their original formats (calendar format for web and paper, and episode format for the app), and the three new harmonised time use diary datasets, which are main addition to this guide. These three datasets have been created by the UCL Centre for Time Use Research by integrating data from web, paper, and app diaries into consistent, user-friendly formats.

This user guide supersedes a previous version published in 2018, which described the TUD harmonised calendar dataset and included SPSS and Stata syntax examples to manage the data. This old user guide is copied in the Appendix for reference.

In addition, the Stata syntax related to the updated harmonised datasets is described and is publicly available via GitHub.

# 1. Time use diaries

## 1.1 What are time use diaries?

Time use diaries (TUD) were first introduced in the 1920s, attempting to capture individuals' time use and provide a highly accurate account of the activities individuals are engaging in, limiting the ability of the respondents to give approximate answers in questions regarding activity durations (Krosnick, 1999, Robinson and Converse, 1972). Time use diaries have been tested against objective measures (accelerometers and wearable cameras) on a volunteer sample of 148 UK adults, validating time use diaries and showing that the time use diary methodology can provide accurate physical activity estimates (Gershuny et al., 2020). It is worth noting however that time use diaries are still a data collection tool that relies on self-completion and is therefore prone to subjective entries (Pedersen et al., 2016).

Time use diaries are collected over a 24-hour period, usually completed in 10- or 15-minute slots, and consist of different information about the activities explored, such as secondary activities, co-presence, affect (enjoyment) and location. They measure the occurrence, duration, and mode and/or purpose of our daily activities; for example, the duration of physical activity in the form of playing sports or commuting. Depending on the study, time use diaries are collected: once, twice (usually on a weekday and on a weekend day), on several days in a week, or for a week. Some studies collect time use diaries over different seasons to ensure a representative picture of time use across the year (Bauman et al., 2019).

Time use diaries allow for a thorough examination of a participant's time use, both in terms of outcomes and context (Gershuny et al., 2020, Hunt and McKay, 2015).
Time use diaries, although primarily relying on self-completion, limit the ability of the participants to provide biased answers (Bringolf-Isler et al., 2009). Time use diaries have been traditionally collected using paper, however new technologies for time use data collection have helped overcome the abovementioned limitations of the diaries completed on paper. Diaries completed on electronic devices can potentially reduce the complexity of the task by using checks and prompts, ultimately improving fatigue that might be caused to the participants during completion, data quality and

response rates (Chatzitheochari et al., 2018, Chatzitheochari and Mylona, 2021, Chatzitheochari and Mylona, 2022)

## 1.2 The MCS time use diaries (TUD)

The MCS currently consists of eight waves of data collection, at ages 9 months and 3, 5, 7, 11, 14, 17 and 23 years (Wave 8 ongoing and release date to be confirmed). In Wave 6, at age 14, time use diary and accelerometer data were collected alongside a range of other elements. The time use diary and accelerometer data were collected on the same days, one weekday and one weekend day, allowing for direct comparison.

The MCS initial sample ensured that all four UK countries, England, Scotland, Wales and Northern Ireland, are represented, as well as ethnic minority groups and individuals living in deprived areas (Plewis, 2007). However, for the Wave 6 time use diary and accelerometer data collections, not all MCS participants were invited to take part, as the activity monitor stock would have depleted if all respondents were eligible, based on return rates and return times observed during piloting (IpsosMORI, 2016). Therefore, reflecting these resource constraints, the MCS selected a random sub-sample of 81% of the participants living in England to complete the time use diary and accelerometer part of the study for wave 6. All participants were included from Wales, Scotland and Northern Ireland, resulting in a total of 88% overall of the initial sample (IpsosMORI, 2016). See the MCS6 Technical Report on Fieldwork for further information.

The time use diary and accelerometer data were collected during Wave 6, on a randomly selected weekday and a weekend day within 10 days, over a 24-hour period, starting from 4am until 4am the following day. For the time use diary, the cohort members were expected to report their **primary activity, location, enjoyment level** and **co-presence**. The MCS provided 44 pre-coded activities that can be grouped in 11 broad categories (*see* Table 1).

**Table 1. MCS6 Time-Use Record Activity Coding Scheme (Broad categories)**

| **Broad categories (Time-Use Domain)** | **Activity Codes** |
|---|---|
| Sleep and personal care | Sleeping and resting (including sick in bed); Personal care (including taking a shower/bath, grooming, getting dressed etc.) |
| School, homework, and education | Homework; In class; School breaks; Schools clubs; Detention |
| Paid and/or unpaid work | Paid work (including paid babysitting and paid work for the family).Unpaid work for family or other non-household members (e.g. help in family business) |
| Chores, housework, and looking after people or animals | Cooking, cleaning, and shopping for the household; Fixing things around the house, fixing bike, gardening; Looking after brothers, sisters, other children in the household; Looking after parent or other adult in the household (medical or personal care); Looking after animals |
| Eating and Drinking | Eating or drinking in a restaurant or café; Eating a meal; Eating a snack or having a drink |
| Physical exercise and Sports | Cycling; Individual ball games and training (e.g. tennis, badminton); Jogging, running, walking, hiking; Team ball games and training (e.g. football, hockey); Swimming and other water sports; Other physical exercise (e.g. dancing, keeping fit) and other sports (e.g. skateboarding, gymnastics) |
| Travelling (including walking to school) | Travel by bus, taxi, tube, plane; Travel by car, van (including vehicles owned by friends and family); Travel by physically active means (walk, bike etc.) |
| Social time and family time | Attending live sporting events; Cinema, theatre, performance, gig etc.; Exhibition, museum, library, otFtwinher cultural events; Shopping (including window shopping, hanging out at shopping centre); Speaking on the phone (including Skype, video calls); Speaking, socialising face-to-face |
| Internet, TV, and Digital Media | Answering emails, instant messaging, texting Browsing and updating social networking sites (e.g. Twitter, Facebook, BBM, Snapchat); General Internet browsing, programming (not time on social networking sites); Listening to music, radio, iPod, other audio content; |

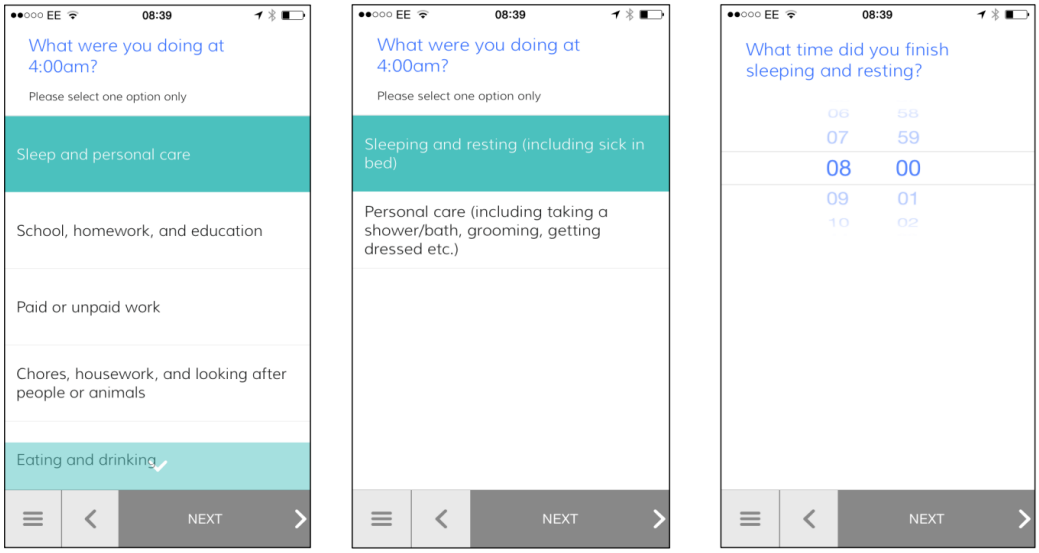
| | |
|---|---|
| | Playing electronic games and Apps Watching TV, DVDs, downloaded videos |
| Volunteering and religious activities | Volunteering; Religious activities (including going to places of worship, praying etc.) |
| Hobbies and other free time | Hobbies and other free time activities; Did nothing, just relaxing, bored, waiting; Hobbies, arts and crafts, musical activities, writing stories, poetry etc.; Reading (not for school) |
| Any other activity | Other activities not listed |

## 1.3 Modes of MCS TUD data collection

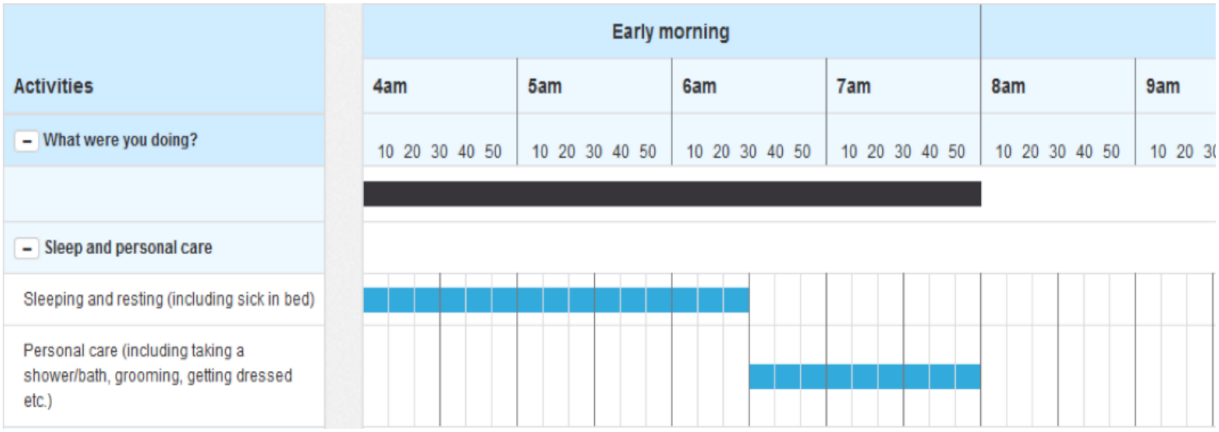
The participants were given the option of completing the time diary on a smartphone app or a via the web on PC/laptop device; if they were unable to complete it on an electronic device for any reason or refused, they were given the option of a paper time diary. The paper and the web diaries followed a similar structure, a time grid, differing from the app, which used a question-based approach (Fisher et al., 2015).

App and web diaries used a range of soft and hard checks, which was not the case for paper diaries (IpsosMORI, 2016). When comparing the three modes of time use data collection in the MCS, it was concluded that web and app diaries yield higher quality data than paper diaries, which highlights the potential of new technologies in facilitating time diary data completion (Chatzitheochari and Mylona, 2022). The same study also found that broad time-use domains did not show substantial mode differences, *not necessarily requiring analysing the time diaries separately, or controlling for mode. Sensitivity checks for mode differences, however, are recommended when analysing these datasets.*

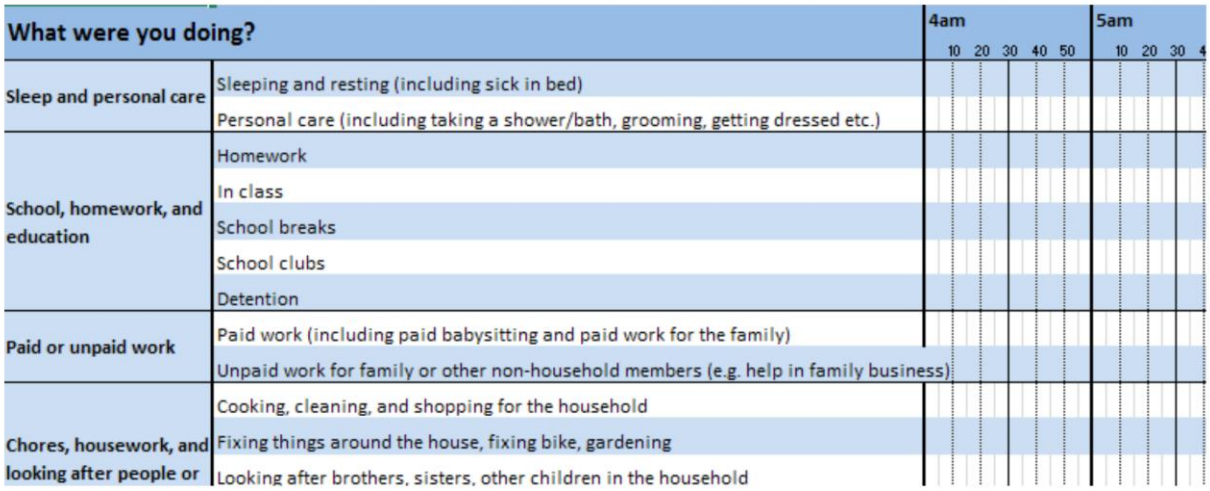
## MCS6 app time diary extract:




## MCS6 web time diary extract:



**MCS6 paper time diary extract:**



| What were you doing? | | 4am 10 20 30 40 50 | 5am 10 20 30 |
|---|---|---|---|
| Sleep and personal care | Sleeping and resting (including sick in bed) | | |
| | Personal care (including taking a shower/bath, grooming, getting dressed etc.) | | |
| School, homework, and education | Homework | | |
| | In class | | |
| | School breaks | | |
| | School clubs | | |
| | Detention | | |
| Paid or unpaid work | Paid work (including paid babysitting and paid work for the family) | | |
| | Unpaid work for family or other non-household members (e.g. help in family business) | | |
| Chores, housework, and looking after people or | Cooking, cleaning, and shopping for the household | | |
| | Fixing things around the house, fixing bike, gardening | | |
| | Looking after brothers, sisters, other children in the household | | |

# 2. Methodology to create TUD research data

## 2.1 The TUD parsed datasets

Three separate parsed datasets containing raw data for each collection mode were created by CLS in 2021.

The raw TUD data collected using the paper and web-based instruments have the same structure since the cohort member can only choose from the 10-minute slots, which we refer to as ‘calendar’ format.

In contrast, the structure of the TUD data collected via the app is based on a different approach, which we refer to as ‘episode’ format, whereby the cohort member had to choose the activity and provide the time when it was carried out, instead of using pre-determined time slots.

Please note that time diary data are only available for singleton cohort members and second cohort member (fcnum00=2) in families of twins.

The data handling and processing is different as discussed below.

### 2.1.1 Web and paper data: calendar format

The raw data from paper have 329 rows and 28 columns whereas the raw data from the web have 1309 rows and 28 columns. In both cases, each row refers to a single cohort member and includes activity measures for both assigned days saved as columns ‘day1_primary’ and ‘day2_primary’. These raw data files were structured as a binary array of size 8352 [(44 activities + 3 where questions + 6 who questions + 5 like questions) * 144 ten-minute slots = 8352].

The binary array format was converted to long format and presented in calendar format, whereby the activity is assigned to 10-minute time slots such that each row represents a 10-minute time slot with the information of the activity, location of the activity, who is accompanied in the activity and the likeliness of the activity in the respective columns. So, a day of activity for a cohort member requires 144 rows (24 hours = 144 ten-minute slots). For example:

| Time | Activity |
|---|---|
| ……. – 08:50 | Breakfast |
| 08:50 – 09:00 | Travel to school |
| 09:00 – 09:10 | Travel to school |
| 09:10 – 09:20 | Travel to school |
| 09:20 – 09:30 | Classroom |
| ……. – ……. | Classroom |
| ……. – 12:30 | Classroom |

The filename of the web and paper parsed datasets in calendar format are:

| Instrument | File name |
|---|---|
| Web | mcs6_tud_parsed_data_web_calendar_format |
| Paper | mcs6_tud_parsed_data_paper_calendar_format |

### 2.1.2 App data: episode format

The raw app data file is in wide format with 6122 rows and 1118 columns. Each row represents a single day activity of a cohort member. The data was presented in

episode format i.e., cohort member had the flexibility to choose the end time for an activity.

The raw app data was converted to long format and parsed in episode format. This format doesn't follow the 10-minute time slot categorization. Instead, the end time specified by the cohort member for an activity was used as it is. For example:

| Time | Activity |
|---|---|
| 08:52 | Breakfast |
| 09:20 | Travel to school |
| 12:32 | Classroom |

The filename of the app parsed datasets in episode format is:

| Instrument | File name |
|---|---|
| App | mcs6_tud_parsed_data_app_episode_calendar_format |

## 2.2 The TUD harmonised calendar datasets

### 2.2.1.The first TUD harmonised calendar dataset

This dataset was created by CLS in 2018 to standardize the three different modes and combined (harmonized) the data so that they represent 10-minute blocks, that is, in calendar format.

The filename of this dataset was **mcs6_cm_tud_harmonised**. The creation of this dataset and its contents are described in detail in the Appendix.

This dataset is no longer available and is superseded by the harmonised datasets described below.

### 2.2.2.The new harmonised datasets

A substantial number of cases in the parsed datasets were missing the day of week of activity and therefore excluded from the first harmonised dataset. Some of this information has now been recovered and the additional cases included in the new

harmonised datasets. These datasets also include extra variables taken from the parsed data

Three new harmonised TUD datasets were created by the UCL Centre for Time Use Research in 2025 to provide more accessible and flexible formats for researchers, addressing limitations of previous releases. All three integrate data from web, paper, and app diaries into a single, consistent structure, regardless of their original collection method.

The work draws on the available MCS time-use data in calendar format, where the app records have been rounded to 10-minute blocks to allow comparisons with the web and paper records. The data from the three modes of data collection have been combined in single datasets to enable researchers to carry out analysis in their preferred format

1. **Calendar-long format**: This dataset represents each day in 10-minute intervals, resulting in 144 rows of data per person per day. It standardises the grid-based (paper/web) and question-based (app) collection approaches into a uniform slot-based structure.
2. **Episode-long format**: Data are organised by episodes of activity. Each record shows the total minutes spent on a given activity, preserving the sequence of daily activities without the 10-minute segmentation.
3. **Harmonised derived variables**: This file contains pre-calculated totals for time spent in each activity per person per day. It is useful for researchers who need quick access to aggregated measures (e.g., daily sleep duration for children) without generating new variables from raw data.

Key improvements of the new datasets include the single integrated files and complete contextual information. Previously, users had to work with separate files for app, web, and paper diaries (parsed files), each in its original collection format. In addition, the initial harmonised release omitted certain variables (e.g., location, co-presence of others). The new datasets retain all contextual details.

By offering harmonised data in multiple formats, complete with contextual variables and ready-to-use derived measures, these new releases allow researchers to begin analysis immediately, using whichever structure best suits their work.

## 2.3 Introducing the Stata package 'timeuse'

User-written commands have been developed by the Centre for Time Use Research to assist with data management of time diary data.

The **timeuse**[1] package for Stata aims to make time use data more accessible to non-expert users. By installing it, the user will be able to use the following programs:

**timeuse**: command to extract basic time use information for multiple activities from a file organised in episodes.

**timeusex**: command to extract detailed time use information for a single activity.

**sequence**: command to create episode files from calendar files.

**sequencex**: command to create episode files from other episode files.

**tocalendar**: command to transform episode files into calendar files

**epichecks**: command to detect errors in episode files.

**clocktomins**: command to convert episode start time from string[2] to minute-of-the day.

**clocktomine**: command to convert episode end time from string to minute-of-the day.

**clocktominb**: command to convert episode start and end time from string to minute-of-the-day.

**If you use any of these programmes, please use the following citation:**

Juana Lamote de Grignon Pérez, 2024. "**TIMEUSE: Stata module to facilitate the manipulation of diary-based time-use data**," Statistical Software Components S459346, Boston College Department of Economics, revised 29 Oct 2024.

[1] The package name is yet to be confirmed. If 'timeuse' does not work, please use 'timealloc' and check timeuse.org for the latest updates.
[2] Values treated as text, also known as alphanumeric variables.

**You can find further information here:**

https://www.timeuse.org

**You can also read further here:**

Lamote de Grignon Pérez and Mylona (2024). 'timeuse' Introducing user-written Stata commands for time diary data analysis. Centre for Time Use Research. Working Paper Series.

https://www.timeuse.org/timeusepackage

# 3. Description of the TUD Research Data

## 3.1 Licensing and data access

The MCS Time Use Diary (TUD) datasets have been supplied to the UK Data Service. All data users need to be registered with the UK Data Service and to sign the UKDS End User Licence. Details of how to do this are available at ukdataservice.ac.uk/get-data/how-to-access/registration.

The MCS Time Use Diary datasets are available as safeguarded data, which can be downloaded from the UK Data Service once the End User Licence (EUL) access conditions have been accepted by the user.

## 3.2 List of datasets

Please note that time diary data are only available for singleton cohort members and second cohort member (fcnum00=2) in families of twins. Should you require the time diaries of both twins for your analyses, please contact the CLS Data Access Committee at: cls.ucl.ac.uk/data-access-training/data-access/accessing-data-directly-from-cls/.

The following table lists the three new deposited datasets that relate to this user guide

**Table 2: List of available datasets**

| Name of the dataset | Content |
|---|---|
| mcs6_tud_parsed_data_app_episode_format | Parsed TUD app data in episode format |
| mcs6_tud_parsed_data_paper_calendar_format | Parsed TUD paper data in calendar format |
| mcs6_tud_parsed_data_web_calendar_format | Parsed TUD web data in calendar format |
| mcs6_cm_tud_harmonised_calendar | Harmonised time-use data in long calendar format (web, paper, app) |
| mcs6_cm_tud_harmonised _episodes | Harmonised time-use data at episode-level (app) |
| mcs6_cm_tud_harmonised _derived | Harmonised time-use derived variables of activity durations (web, paper, app) |

The syntax related to the harmonised datasets is described in section 3.6.

## 3.3 Identifiers

For MCS, researchers need to use both the MCS family identifier (MCSID) and the two individual person identifiers (CNUM00/PNUM00) to merge with other cohort data. As CNUM00 and PNUM00 include the wave number they may need consistent naming across datasets beforehand depending on the method of merging used.

There are different ways the data of MCS can be merged depending on the focus of the research project (Parent/Carers, Cohort Members or family). Details, syntax and examples on merging is provided by the MCS Data Handling Guide.

## 3.4 Contents of the TUD harmonised datasets

### 3.4.1 Renamed variables

Some variables that appear in the parsed datasets have been renamed for clarity in the new harmonised datasets as per the table below:

| Old variable name | New variable name | Variable description |
|---|---|---|
| **FCTUDSLOT** | ftud_slot | Time slot at which the activity takes place |
| **FCTUDMOD** | ftud_mode | TUD Mode of data collection |
| **FCTUDACT** | ftud_activity | Activity for the slot |
| - | ftud_where | Location during the activity |
| **FCTUDWHO01** | ftud_who1 | Who were you with? Alone |
| **FCTUDWHO02** | ftud_who2 | Who were you with? Mother |
| **FCTUDWHO03** | ftud_who3 | Who were you with? Father |
| **FCTUDWHO04** | ftud_who4 | Who were you with? Friends or other young people (up to 18 years old) |
| **FCTUDWHO05** | ftud_who5 | Who were you with? Siblings (brother or sister) |
| **FCTUDWHO06** | ftud_who6 | Who were you with? Other adults |
| - | ftud_who7 | Who were you with? Don't want to answer |
| **FCTUDHOW0(x) (recoded)** | ftud_like | How much did you like the activity? |
| **FCTUDFINQ10(x) (recoded)** | ftud_atypical | Was this an unusual day? |
| **FCTUDFINQ10(x) (recoded)** | ftud_atypical_why | Why was the day atypical? |
| **FCTUDFINQ20(x) (recoded)** | ftud_problems | Did you encounter problems when filling in the diary? |
| - | FOVWT1_dayadj | FOVWT1 adjusted to balance day of the week |
| - | FOVWT2_dayadj | FOVWT2 adjusted to balance day of the week |

### 3.4.2 Contents of the harmonised dataset in calendar format

The variables of the **mcs6_cm_tud_harmonised_calendar** dataset are:

| Variable name | Variable description |
|---|---|
| MCSID | MCS Research ID - Anonymised Family/Household Identifier |
| FCNUM00 | Cohort Member number within an MCS family |
| FCTUDAD | Order of day assigned for accelerometer and time use diary |
| ftud_slot | Time slot at which the activity takes place |
| ftud_mode | TUD Mode of data collection |
| FCTUDMONTH | Date: Month for Physical Activity (Time Use Diary and Accelerometer) |
| FCTUDYEAR | Year of TUD date |
| ftud_activity | Activity for the slot |
| ftud_where | Location during the activity |
| ftud_who01 | Who were you with? Alone |
| ftud_who02 | Who were you with? Mother |
| ftud_who03 | Who were you with? Father |
| ftud_who04 | Who were you with? Friends or other young people (up to 18 years old) |
| ftud_who05 | Who were you with? Siblings (brother or sister) |
| ftud_who06 | Who were you with? Other adults |
| ftud_who07 | Who were you with? Don't want to answer |
| ftud_like | How much did you like the activity? |
| ftud_atypical | Was this unusual day? |
| ftud_atypical_why | Why was the day atypical |
| ftud_problems | Did you encounter problems when filling in the diary? |
| FCTUDFINQ30 | When did you fill in the diary? |
| FCACCWEEKDAY | Day of week allocated (taken from paradata) - numeric |
| FOVWT1 | S6: Overall Weight (inc NR adjustment) single country analyses |
| FOVWT2 | S6: Overall Weight (inc NR adjustment) whole uk analyses |
| FOVWT1_dayadj | FOVWT1 adjusted to balance day of the week |
| FOVWT2_dayadj | FOVWT2 adjusted to balance day of the week |

### 3.4.3 Contents of the harmonised dataset in episode format

The variables of the **mcs6_cm_tud_harmonised_episodes** dataset are:

| Variable name | Variable description |
|---|---|
| MCSID | MCS Research ID - Anonymised Family/Household Identifier |
| FCNUM00 | Cohort Member number within an MCS family |
| FCTUDAD | Order of day assigned for accelerometer and time use diary |
| ftud_epinum | Episode number |
| ftud_start | Start time of episode (minute of day) |
| ftud_end | End time of episode (minute of day) |
| ftud_time | Duration of episode (minutes) |
| ftud_clockst | Start time on 24-hour clock |
| ftud_activity | Activity for the slot |
| ftud_where | Location during the activity |
| ftud_who01 | Who were you with? Alone |
| ftud_who02 | Who were you with? Mother |
| ftud_who03 | Who were you with? Father |
| ftud_who04 | Who were you with? Friends or other young people (up to 18 years old) |
| ftud_who05 | Who were you with? Siblings (brother or sister) |
| ftud_who06 | Who were you with? Other adults |
| ftud_who07 | Who were you with? Don't want to answer |
| ftud_like | How much did you like the activity? |
| ftud_mode | TUD Mode of data collection |
| FCTUDMONTH | Date: Month for Physical Activity (Time Use Diary and Accelerometer) |
| FCTUDYEAR | Year of TUD date |
| ftud_atypical | Was this unusual day? |
| ftud_atypical_why | Why was the day atypical |
| ftud_problems | Did you encounter problems when filling in the diary? |
| FCTUDFINQ30 | When did you fill in the diary? |
| FCACCWEEKDAY | Day of week allocated (taken from paradata) - numeric |
| FOVWT1 | S6: Overall Weight (inc NR adjustment) single country analyses |

| | |
|---|---|
| FOVWT2 | S6: Overall Weight (inc NR adjustment) whole uk analyses |
| FOVWT1_dayadj | FOVWT1 adjusted to balance day of the week |
| FOVWT2_dayadj | FOVWT2 adjusted to balance day of the week |

### 3.4.4 Contents of the harmonised derived variables dataset

The variables of the **mcs6_cm_tud_harmonised_derived** dataset are:

| Variable name | Variable description |
|---|---|
| MCSID | MCS Research ID - Anonymised Family/Household Identifier |
| FCNUM00 | Cohort Member number within an MCS family |
| FCTUDAD | Order of day assigned for accelerometer and time use diary |
| ftud_activity_1 | mpd on: Sleeping and resting (including sick in bed) |
| ftud_activity_2 | mpd on: Personal care (including taking a shower/bath, grooming, getting dressed etc.) |
| ftud_activity_3 | mpd on: Homework |
| ftud_activity_4 | mpd on: In class |
| ftud_activity_5 | mpd on: School breaks |
| ftud_activity_6 | mpd on: School clubs |
| ftud_activity_7 | mpd on: Detention |
| ftud_activity_8 | mpd on: Paid work (including paid babysitting and paid work for the family) |
| ftud_activity_9 | mpd on: Unpaid work for family or other non-household members (e.g. help in family business) |
| ftud_activity_10 | mpd on: Cooking, cleaning, and shopping for the household |
| ftud_activity_11 | mpd on: Fixing things around the house, fixing bike, gardening |
| ftud_activity_12 | mpd on: Looking after brothers, sisters, other children in the household |
| ftud_activity_13 | mpd on: Looking after parent or other adult in the households (medical or person care) |
| ftud_activity_14 | mpd on: Pet care |
| ftud_activity_15 | mpd on: Eating or drinking in a restaurant or cafe? |
| ftud_activity_16 | mpd on: Eating a meal |
| ftud_activity_17 | mpd on: Eating a snack or having a drink |
| ftud_activity_18 | mpd on: Cycling |

| Variable name | Variable description |
|---|---|
| ftud_activity_19 | mpd on: Individual ball games and training (e.g. tennis, badminton) |
| ftud_activity_20 | mpd on: Jogging, running, walking, hiking |
| ftud_activity_21 | mpd on: Team ball games and training (e.g. football, hockey) |
| ftud_activity_22 | mpd on: Swimming and other water sports |
| ftud_activity_23 | mpd on: Other exercise and sports, dancing, keeping fit, skiing, gymnastics |
| ftud_activity_24 | mpd on: Travel by bus, taxi, tube, plane |
| ftud_activity_25 | mpd on: Travel by car, van (including vehicles owned by friends and family) |
| ftud_activity_26 | mpd on: Travel by physically active means (walk, bike etc.) |
| ftud_activity_27 | mpd on: Attending live sporting events |
| ftud_activity_28 | mpd on: Cinema, theatre, performance, gig etc. |
| ftud_activity_29 | mpd on: Exhibition, museum, library, other cultural events |
| ftud_activity_30 | mpd on: Shopping (including window shopping, hanging out at shopping centre) |
| ftud_activity_31 | mpd on: Speaking on the phone (including Skype, video calls) |
| ftud_activity_32 | mpd on: Speaking, socialising face-to-face |
| ftud_activity_33 | mpd on: Answering emails, instant messaging, texting |
| ftud_activity_34 | mpd on: Browsing and updating social networking sites (e.g. Twitter, Facebook, BBM, Snapchat) |
| ftud_activity_35 | mpd on: General internet browsing, programming (not time on social networking sites) |
| ftud_activity_36 | mpd on: Listening to music, radio, iPod, other audio content |
| ftud_activity_37 | mpd on: Playing electronic games and Apps |
| ftud_activity_38 | mpd on: Watch TV, DVDs, downloaded videos |
| ftud_activity_39 | mpd on: Volunteering |
| ftud_activity_40 | mpd on: Religious activities (including going to places of worship, praying etc.) |
| ftud_activity_41 | mpd on: Did nothing, just relaxing, bored, waiting |
| ftud_activity_42 | mpd on: Hobbies, arts and crafts, musical activities, writing stories, poetry etc. |
| ftud_activity_43 | mpd on: Reading (not for school) |
| ftud_activity_44 | mpd on: Other activities not listed |
| ftud_activity_99 | mpd on: Missing |

| Variable name | Variable description |
|---|---|
| ftud_mode | TUD Mode of data collection |
| FCTUDMONTH | Date: Month for Physical Activity (Time Use Diary and Accelerometer) |
| FCTUDYEAR | Year of TUD date |
| ftud_atypical | Was this unusual day? |
| ftud_atypical_why | Why was the day atypical |
| ftud_problems | Did you encounter problems when filling in the diary? |
| FCTUDFINQ30 | When did you fill in the diary? |
| FCACCWEEKDAY | Day of week allocated (taken from paradata) - numeric |
| FOVWT1 | S6: Overall Weight (inc NR adjustment) single country analyses |
| FOVWT2 | S6: Overall Weight (inc NR adjustment) whole uk analyses |
| FOVWT1_dayadj | FOVWT1 adjusted to balance day of the week |
| FOVWT2_dayadj | FOVWT2 adjusted to balance day of the week |

The variable FCACCWEEKDAY in the above datasets also appears in the MCS6 accelerometer data and can help users wishing to merge between the two sources of data.

## 3.5 Weighting

Data weights can be found in the MCS longitudinal family data file (to adjust for the survey's complex initial design and attrition throughout the years). Missing values were either given a value from a previous sweep (if the factor was unlikely to change over time; for example, ethnicity and parental education), or multiple imputation was used to estimate missing values for other variables such as type of accommodation (Mostafa and Ploubidis, 2017). By multiplying the sampling weights in Wave 1 with the attrition weights of Waves 2-6 (calculated in a similar way), two overall weights were constructed and scaled to fit the productive cases sample size: FOVWT1, Wave 6 overall weight for single country analysis and FOVWT2, Wave 6 overall weight for whole of UK analyses.

In addition, the following weights have been computed and adjust for the 'day of the week'. The MCS collected two time diaries per cohort member, one on a weekday

and one on a weekend day. Therefore, the sample of diaries is unbalanced in terms of days of the week (as the week has 5 weekdays, but only 2 weekend days). In order to capture the heterogeneity of activities during the weekend, we recommend using the weights provided in the time diary file(s). Please note that if you conduct separate analyses by weekday/weekend day, there is no need to adjust for the day of the week.[3] The new weights are the following:

- FOVWT1_dayadj - FOVWT1 adjusted to balance day of the week
- FOVWT2_dayadj - FOVWT2 adjusted to balance day of the week

## 3.6. The Stata Do File

The Stata Do file is published in GitHub page:

https://github.com/CLS-Data/MCS-Wave-6-Harmonised-Time-Use-Diary-Data

and can be used for the following purposes:

**Part I: Opening/Using the data**

- Opening/using the MCS time diary data long calendar file
- Merging the MCS time diary data file with the MCS cohort member survey dataset (for more weight-related variables please see Longitudinal Family file)
- Sort the data by:
  - Participant ID
  - Diary order (up to two time diaries per person)
  - Slot number (reflecting the correct order of the time in the day the activities reported started)

**Part II: Creating time use variables**

*You will first need to run the syntax from part I.*

[3] There are four time diaries that do not include the day of the week, and therefore the weight is 0.

- A set of 11 variables, counting the **duration** of each broad activity in minutes of the diary day[4]
- A set of 11 variables, indicating **whether the participant engaged** in that broad activity **in the diary day or not[5]**

Using the same syntax, you can create duration and participation variables for all activities and combination of activities.

- A variable counting the **number of episode[6] changes** per participant per diary day for the primary activities
- A variable counting the **number of episode changes** per participant per diary day for the location
- A variable counting the **number of episode changes** per participant per diary day for the enjoyment
- A variable indicating whether the diary was completed on a weekday or a weekend day
- A variable indicating whether the diary was completed on a school day or a non-school day
- A variable indicating the season the diary was completed

Co-presence is coded in a different way, allowing users to create variables according to their needs. The following examples are provided in the Do file:

- Example 1: Total time spent in a day in minutes sleeping with any other person (not alone)
- Example 2: Total time spent in a day in minutes doing physical activity with mother, father or both
- Example 3: Total time spent in a day in minutes socialising with friends

---

[4] A total daily duration in minutes variable is created per category, summing up the total minutes each cohort member engaged in that activity.

[5] If the cohort member engaged in at least one of those activities, they will receive a score of '1' in the binary participation variable.

[6] An episode in this example is defined by (any change in the) primary activity, in the second example an episode is defined by location, and in the third by enjoyment level

**Part III: Quality indicators**

Time diary quality criteria vary, these are examples.

*You will first need to run the syntax from parts I and II.*

- A binary indicator of whether the participant had 6 or more episodes reported in the primary activity in the diary day
- A binary indicator for more than 90 minutes of missing data in a diary day
- A set of 3 different scenarios that indicate the quality of the data at the level of an individuals' diary day, using a binary indicator based on the following conditions:

  Scenario I.

  More than 6 episode changes (primary activity) and at least one episode of sleep/rest/personal care

  Scenario II.

  More than 6 episode changes (primary activity), at least one episode of sleep/rest/personal care and less than 90 minutes of missing data

  Scenario III.

  More than 6 episode changes (primary activity), at least one episode of sleep/rest/personal care, less than 90 minutes of missing data and at least one episode of eating/drinking

**Part IV: Instantaneous enjoyment**

*You will first need to run the syntax from parts I and II.*

- A binary indicator of whether a participant's enjoyment level changed at any point at least once during the diary day
- A variable calculating the mean enjoyment per participant per diary day
- An example calculating the mean enjoyment per participant per diary day of each broad activity (sleeping)

**IT IS ESSENTIAL THAT ONCE YOU ARE DONE WITH THE DATA MANAGEMENT, YOU KEEP ONE ROW PER DIARY, and thus TWO ROWS PER INDIVIDUAL.**

**keep if ftud_slot==1**

Given the recoding of the data, you will not require 144[7] rows per participant per diary anymore for various types of analyses. If you wish to do further recoding, you need to reload the full dataset/restore it to its initial format.

Useful Stata commands for time use data:

- **preserve/restore**
- **dtable**
- **tabstat**
- **esttab**
- **coefplot**

## Important notes

1. File format ends up with 1 row per diary, and 2 rows per participant (one row for the weekday and one for the weekend day).

2. This user guide does not cover merging with parent/guardian data files. If you require merging with these data files, please note that the diaries will now include 288 rows per diary, instead of 144 (if two parents/guardians are available). You will need to use different data management techniques to include the same information in one row.

[7] Remember, one day has 1440 minutes. This dataset includes activities participants engaged in every 10 minutes.

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# Appendix

The appended document is the user guide that accompanied the original harmonised TUD dataset. It includes a small number of SPSS and Stata syntax examples and is included here for reference. The document appears as .png images to maintain formatting and page numbering of the of the original. A .pdf version is available on request from CLS if required (clsdata@uck.ac.uk)

Institute of Education

# Millennium Cohort Study

## Physical Activity: Time Use Diary harmonised dataset

MCS6(2015)

USER GUIDE

March 2018, Edition 2

Joe Heywood

CENTRE FOR LONGITUDINAL STUDIES

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# 1 Preface

First published in 2017 by the Centre for Longitudinal Studies
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ISBN 978-1-906929-94-7

The Centre for Longitudinal Studies (CLS) is an ESRC Resource Centre based at the Institute of Education (UCL).

It provides support and facilities for those using the three internationally-renowned birth cohort studies: the National Child Development Study (1958), the 1970 British Cohort Study and the Millennium Cohort Study (2000). CLS conducts research using the birth cohort study data, with a special interest in family life and parenting, family economics, youth life course transitions and basic skills. The views expressed in this work are those of the author(s) and do not necessarily reflect the views of the Economic and Social Research Council. All errors and omissions remain those of the author(s).

This document is available in alternative formats.
Please contact the Centre for Longitudinal Studies.
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## 2 Millennium Cohort Study

The Millennium Cohort Study (MCS) is a multi-disciplinary research project following the lives of around 19,000 children born in the UK in 2000-01. It is the most recent of Britain's world-renowned national longitudinal birth cohort studies. The study has been tracking the Millennium children through their early childhood years and plans to follow them into adulthood. It collects information on the children's siblings and parents. MCS's field of inquiry covers such diverse topics as parenting; childcare; school choice; child behaviour and cognitive development; child and parental health; parent's employment and education; income and poverty; housing, neighbourhood and residential mobility; and social capital and ethnicity.

The study is core funded by the Economic and Social Research Council (ESRC) and a consortium of Government departments.

To date, there have been six surveys of the cohort: at age nine months, three, five, seven, eleven and fourteen years old.

| Sweep | Fieldwork start | Mean age of Cohort Members |
|---|---|---|
| MCS 1 | 2001 | 9 months |
| MCS 2 | 2004 | 3 years old |
| MCS 3 | 2006 | 5 years old |
| MCS 4 | 2008 | 7 years old |
| MCS 5 | 2012 | 11 years old |
| MCS 6 | 2015 | 14 years old |
| MCS 7 | 2018 | 17 years old |

Further information about the MCS is available from the CLS website http://www.cls.ioe.ac.uk/mcs.

For any queries please contact help@ukdataservice.ac.uk

# 3 Introduction to the Time Use Diary of MCS6

This document accompanies the deposit of the Millenniuum Cohort Study's physical activity data. This data contains the harmonized information collected by the Time Use Diary through a paper form or through a mobile application or through an online form. Cohort members who paricipated in the age 14 sweep of MCS were asked to complete a Time Use Diary for two specified full days: one during the week and another over a weekend [1] .

Details on the Physical Activity module and the Time Use Diary or Accelerometer is provided [1] and [2] .

## 3.1 Different modes

Cohort members were provided with the option of two modes (online or app). If the Cohort Member refused these two modes or they were impractical, then a paper mode was provided as a n option. The three modes are:

- Online, the data were entered in a web form
- App, the data were enered in a mobile/tablet application
- Paper, the data were entered on a paper form

The online and paper versions split the day into 10 minute slots starting from 4am each day.

CLS standardized the three different modes and harmonized the data so that they represent 10-minute blocks.

[1] Centre for Longitudinal Studies (2017) *Millennium Cohort Study Sixth Sweep (MCS6). Age 14 Survey. Activity Monitor, Time Use and Physical Measurement*

[2] Ipsos MORI Social Research Institute (2016) *Millennium Cohort Study Sixth Sweep (MCS6). Time Use Diary Documentation. Prepared for the Centre for Longitudinal Studies, UCL Institute of Education*

# 4 Variables

| | |
|---|---|
| MCSID | MCS Research ID - Anonymised Family/Household Identifier |
| FCNUM00 | Cohort Member number within an MCS family |
| FCTUDAD | Order of day assigned for Accelerometer and Time Use Diary |
| FCTUDSLOT | 10-minute slot of data entry starting from 04:00 |
| FCTUDMOD | TUD Mode of data collection |
| FCTUDMONTH | Date: Month for Physical Activity (Time Use Diary and Accelerometer) |
| FCTUDYEAR | Date: Year for Physical Activity (Time Use Diary and Accelerometer) |
| FCTUDWEEKDAY | Weekday for Physical Activity (Time Use Diary and Accelerometer) |
| FCTUDACT | Activity for the slot |

## 4.1 Dataset structure

The structure of the dataset is on the _cm_ level which means that each Cohort Member occupies a row. There are families that have more than one Cohort Members (e.g. twins, triplets). The information is provided in a long format with one row per 10 minute slot for each of the assigned days.

There are 144 10-minute slots within a day and 288 in two days. This means that for one Cohort Member that filled in both days there are 288 rows that cover the slots of the first and the second day.

The percentage of complete diaries with no activities missing is 82,18. This percentage corresponds to 7088 diaries of both assigned days across cohort members. Only 1537 diaries have activity not reported for one or more slots.

The total number of Cohort Members that competed the time use diary is 4642. The majority of the Cohort Members of those that have completed the time use diary has done so for both assigned days; that is 3983. However, for a few cases only the first (617 cases) or the second day (42 cases) is available.

The variable weekday gives the day of the week. The order of the assigned day provided by the FCTUDAD is not related to weekday. This means that researchers need to use FCTUDWEEKDAY to identify whether the first or the second day of the case is weekday or weekend.

## Time Use Diary visualisation of the dataset format

| MCSID | FCNUM00 | FCTUDAD | FCTUDSLOT | FCTUDACT | FCTUDWEEKDAY |
|---|---|---|---|---|---|
| Household / Family identifier | Cohort Member number within a family | Assigned Day | 10-minute slot (144 in 24 hours) | Activity | Whether the assigned day is weekday or weekend (Month and Year are also provided) |
| Family 1 | 1st CM of the family | First assigned day | 10-minute slot 1 (at 4am) | | Weekend (Saturday, Sunday) |
| Family 1 | 1st CM of the family | First assigned day | 10-minute slot 2 | | Weekend (Saturday, Sunday) |
| Family 1 | 1st CM of the family | First assigned day | 10-minute slot 50 | | Weekend (Saturday, Sunday) |
| Family 1 | 1st CM of the family | First assigned day | 10-minute slot 70 | | Weekend (Saturday, Sunday) |
| Family 1 | 1st CM of the family | First assigned day | 10-minute slot 100 | | Weekend (Saturday, Sunday) |
| ... | ... | ... | ... | | ... |
| Family 1 | 1st CM of the family | First assigned day | 10-minute slot 144 | | Weekend (Saturday, Sunday) |
| Family 1 | 1st CM of the family | Second assigned day | 10-minute slot 1 (at 4am) | | Weekday (Monday – Friday) |
| Family 1 | 1st CM of the family | Second assigned day | 10-minute slot 30 | | Weekday (Monday – Friday) |
| Family 1 | 1st CM of the family | Second assigned day | 10-minute slot 40 | | Weekday (Monday – Friday) |
| Family 1 | 1st CM of the family | Second assigned day | 10-minute slot 50 | | Weekday (Monday – Friday) |
| ... | ... | ... | ... | | ... |
| Family 1 | 1st CM of the family | Second assigned day | 10-minute slot 144 | | Weekday (Monday – Friday) |
| Family 1 | 2nd CM of the family | First assigned day | 10-minute slot 40 | | Weekday (Monday – Friday) |
| ... | ... | ... | ... | | ... |
| Family 2 | 1st CM of the family | Second assigned day | 10-minute slot 110 | | Weekday (Monday – Friday) |

The assigned days are two per child: one is a weekday and one is in the weekend. **The order of the assigned day does not correspond to the weekday.**

The 44 activities can get clustered into general activities using syntax provided

_cm_ level multiple CMs per family

There may be only one day collected for a CM

## 4.2 10-minute slots

There are 144 10-minute slots in a day. The 10-minute slots start from 4 a.m. as shown in the table below.

| Slot | Period | Slot | Period | Slot | Period | Slot | Period |
|---|---|---|---|---|---|---|---|
| 1 | 04:00 to 04:10 | 37 | 10:00 to 10:10 | 73 | 16:00 to 16:10 | 109 | 22:00 to 22:10 |
| 2 | 04:10 to 04:20 | 38 | 10:10 to 10:20 | 74 | 16:10 to 16:20 | 110 | 22:10 to 22:20 |
| 3 | 04:20 to 04:30 | 39 | 10:20 to 10:30 | 75 | 16:20 to 16:30 | 111 | 22:20 to 22:30 |
| 4 | 04:30 to 04:40 | 40 | 10:30 to 10:40 | 76 | 16:30 to 16:40 | 112 | 22:30 to 22:40 |
| 5 | 04:40 to 04:50 | 41 | 10:40 to 10:50 | 77 | 16:40 to 16:50 | 113 | 22:40 to 22:50 |
| 6 | 04:50 to 05:00 | 42 | 10:50 to 11:00 | 78 | 16:50 to 17:00 | 114 | 22:50 to 23:00 |
| 7 | 05:00 to 05:10 | 43 | 11:00 to 11:10 | 79 | 17:00 to 17:10 | 115 | 23:00 to 23:10 |
| 8 | 05:10 to 05:20 | 44 | 11:10 to 11:20 | 80 | 17:10 to 17:20 | 116 | 23:10 to 23:20 |
| 9 | 05:20 to 05:30 | 45 | 11:20 to 11:30 | 81 | 17:20 to 17:30 | 117 | 23:20 to 23:30 |
| 10 | 05:30 to 05:40 | 46 | 11:30 to 11:40 | 82 | 17:30 to 17:40 | 118 | 23:30 to 23:40 |
| 11 | 05:40 to 05:50 | 47 | 11:40 to 11:50 | 83 | 17:40 to 17:50 | 119 | 23:40 to 23:50 |
| 12 | 05:50 to 06:00 | 48 | 11:50 to 12:00 | 84 | 17:50 to 18:00 | 120 | 23:50 to 00:00 |
| 13 | 06:00 to 06:10 | 49 | 12:00 to 12:10 | 85 | 18:00 to 18:10 | 121 | 00:00 to 00:10 |
| 14 | 06:10 to 06:20 | 50 | 12:10 to 12:20 | 86 | 18:10 to 18:20 | 122 | 00:10 to 00:20 |
| 15 | 06:20 to 06:30 | 51 | 12:20 to 12:30 | 87 | 18:20 to 18:30 | 123 | 00:20 to 00:30 |
| 16 | 06:30 to 06:40 | 52 | 12:30 to 12:40 | 88 | 18:30 to 18:40 | 124 | 00:30 to 00:40 |
| 17 | 06:40 to 06:50 | 53 | 12:40 to 12:50 | 89 | 18:40 to 18:50 | 125 | 00:40 to 00:50 |
| 18 | 06:50 to 07:00 | 54 | 12:50 to 13:00 | 90 | 18:50 to 19:00 | 126 | 00:50 to 01:00 |
| 19 | 07:00 to 07:10 | 55 | 13:00 to 13:10 | 91 | 19:00 to 19:10 | 127 | 01:00 to 01:10 |
| 20 | 07:10 to 07:20 | 56 | 13:10 to 13:20 | 92 | 19:10 to 19:20 | 128 | 01:10 to 01:20 |
| 21 | 07:20 to 07:30 | 57 | 13:20 to 13:30 | 93 | 19:20 to 19:30 | 129 | 01:20 to 01:30 |
| 22 | 07:30 to 07:40 | 58 | 13:30 to 13:40 | 94 | 19:30 to 19:40 | 130 | 01:30 to 01:40 |
| 23 | 07:40 to 07:50 | 59 | 13:40 to 13:50 | 95 | 19:40 to 19:50 | 131 | 01:40 to 01:50 |
| 24 | 07:50 to 08:00 | 60 | 13:50 to 14:00 | 96 | 19:50 to 20:00 | 132 | 01:50 to 02:00 |
| 25 | 08:00 to 08:10 | 61 | 14:00 to 14:10 | 97 | 20:00 to 20:10 | 133 | 02:00 to 02:10 |
| 26 | 08:10 to 08:20 | 62 | 14:10 to 14:20 | 98 | 20:10 to 20:20 | 134 | 02:10 to 02:20 |
| 27 | 08:20 to 08:30 | 63 | 14:20 to 14:30 | 99 | 20:20 to 20:30 | 135 | 02:20 to 02:30 |
| 28 | 08:30 to 08:40 | 64 | 14:30 to 14:40 | 100 | 20:30 to 20:40 | 136 | 02:30 to 02:40 |
| 29 | 08:40 to 08:50 | 65 | 14:40 to 14:50 | 101 | 20:40 to 20:50 | 137 | 02:40 to 02:50 |
| 30 | 08:50 to 09:00 | 66 | 14:50 to 15:00 | 102 | 20:50 to 21:00 | 138 | 02:50 to 03:00 |
| 31 | 09:00 to 09:10 | 67 | 15:00 to 15:10 | 103 | 21:00 to 21:10 | 139 | 03:00 to 03:10 |
| 32 | 09:10 to 09:20 | 68 | 15:10 to 15:20 | 104 | 21:10 to 21:20 | 140 | 03:10 to 03:20 |
| 33 | 09:20 to 09:30 | 69 | 15:20 to 15:30 | 105 | 21:20 to 21:30 | 141 | 03:20 to 03:30 |
| 34 | 09:30 to 09:40 | 70 | 15:30 to 15:40 | 106 | 21:30 to 21:40 | 142 | 03:30 to 03:40 |
| 35 | 09:40 to 09:50 | 71 | 15:40 to 15:50 | 107 | 21:40 to 21:50 | 143 | 03:40 to 03:50 |
| 36 | 09:50 to 10:00 | 72 | 15:50 to 14:00 | 108 | 21:50 to 22:00 | 144 | 03:50 to 04:00 |

# 5 Recoding to General Activities

The 44 specific activities can get clustered in 11 general activities as they appear in the paper version of the TUD questionnaire. The following SPSS syntax and STATA code creates the general activity variable.

## 5.1 SPSS Syntax

```
* Sleep and personal care > Sleeping and resting (including sick in bed) .
IF (FCTUDACT EQ 1) GENERAL_ACTIVITY = 1.
* Sleep and personal care > Personal care (including taking a shower/bath,
   grooming, getting dressed etc.) .
IF (FCTUDACT EQ 2) GENERAL_ACTIVITY = 1.
* Education related > Homework .
IF (FCTUDACT EQ 3) GENERAL_ACTIVITY = 2.
* Education related > In class .
IF (FCTUDACT EQ 4) GENERAL_ACTIVITY = 2.
* Education related > School breaks .
IF (FCTUDACT EQ 5) GENERAL_ACTIVITY = 2.
* Education related > School clubs .
IF (FCTUDACT EQ 6) GENERAL_ACTIVITY = 2.
* Education related > Detention .
IF (FCTUDACT EQ 7) GENERAL_ACTIVITY = 2.
* WORK > Paid work (including paid babysitting and paid work for the family
   ) .
IF (FCTUDACT EQ 8) GENERAL_ACTIVITY = 3.
* WORK > Unpaid work for family or other non-household members (e.g. help
   in family business) .
IF (FCTUDACT EQ 9) GENERAL_ACTIVITY = 3.
* House chores > Cooking, cleaning, and shopping for the household .
IF (FCTUDACT EQ 10) GENERAL_ACTIVITY = 4.
* House chores > Fixing things around the house, fixing bike, gardening .
IF (FCTUDACT EQ 11) GENERAL_ACTIVITY = 4.
* House chores > Looking after brothers, sisters, other children in the
   household .
IF (FCTUDACT EQ 12) GENERAL_ACTIVITY = 4.
* House chores > Looking after parent or other adult in the households (
   medical or personal care) .
IF (FCTUDACT EQ 13) GENERAL_ACTIVITY = 4.
* House chores > Pet care .
IF (FCTUDACT EQ 14) GENERAL_ACTIVITY = 4.
* Eating and drinking > Eating or drinking in a restaurant or caf?? .
IF (FCTUDACT EQ 15) GENERAL_ACTIVITY = 5.
* Eating and drinking > Eating a meal .
IF (FCTUDACT EQ 16) GENERAL_ACTIVITY = 5.
* Eating and drinking > Eating a snack or having a drink .
IF (FCTUDACT EQ 17) GENERAL_ACTIVITY = 5.
* Physical exercise and sports > Cycling .
IF (FCTUDACT EQ 18) GENERAL_ACTIVITY = 6.
* Physical exercise and sports > Individual ball games and training (e.g.
   tennis, badminton) .
```

```
IF (FCTUDACT EQ 19) GENERAL_ACTIVITY = 6.
* Physical exercise and sports > Jogging, running, walking, hiking .
IF (FCTUDACT EQ 20) GENERAL_ACTIVITY = 6.
* Physical exercise and sports > Team ball games and training (e.g.
   football, hockey) .
IF (FCTUDACT EQ 21) GENERAL_ACTIVITY = 6.
* Physical exercise and sports > Swimming and other water sports .
IF (FCTUDACT EQ 22) GENERAL_ACTIVITY = 6.
* Physical exercise and sports > Other exercise and sports, dancing,
   keeping fit, skiing, gymnastics .
IF (FCTUDACT EQ 23) GENERAL_ACTIVITY = 6.
* Travelling > Travel by bus, taxi, tube, plane .
IF (FCTUDACT EQ 24) GENERAL_ACTIVITY = 7.
* Travelling > Travel by car, van (including vehicles owned by friends and
   family) .
IF (FCTUDACT EQ 25) GENERAL_ACTIVITY = 7.
* Travelling > Travel by physically active means (walk, bike etc.) .
IF (FCTUDACT EQ 26) GENERAL_ACTIVITY = 7.
* Social events, outings > Attending live sporting events .
IF (FCTUDACT EQ 27) GENERAL_ACTIVITY = 8.
* Social events, outings > Cinema, theatre, performance, gig etc. .
IF (FCTUDACT EQ 28) GENERAL_ACTIVITY = 8.
* Social events, outings > Exhibition, museum, library, other cultural
   events .
IF (FCTUDACT EQ 29) GENERAL_ACTIVITY = 8.
* Social events, outings > Shopping (including window shopping, hanging out
    at shopping centre) .
IF (FCTUDACT EQ 30) GENERAL_ACTIVITY = 8.
* Social events, outings > Speaking on the phone (including Skype, video
   calls) .
IF (FCTUDACT EQ 31) GENERAL_ACTIVITY = 8.
* Social events, outings > Speaking, socialising face-to-face .
IF (FCTUDACT EQ 32) GENERAL_ACTIVITY = 8.
* Digital media > Answering emails, instant messaging, texting .
IF (FCTUDACT EQ 33) GENERAL_ACTIVITY = 9.
* Digital media > Browsing and updating social networking sites (e.g.
   Twitter, Facebook, BBM, Snapchat) .
IF (FCTUDACT EQ 34) GENERAL_ACTIVITY = 9.
* Digital media > General internet browsing, programming (not time on
   social networking sites) .
IF (FCTUDACT EQ 35) GENERAL_ACTIVITY = 9.
* Digital media > Listening to music, radio, iPod, other audio content .
IF (FCTUDACT EQ 36) GENERAL_ACTIVITY = 9.
* Digital media > Playing electronic games and Apps .
IF (FCTUDACT EQ 37) GENERAL_ACTIVITY = 9.
* Digital media > Watch TV, DVDs, downloaded videos .
IF (FCTUDACT EQ 38) GENERAL_ACTIVITY = 9.
* Volunteering, Spiritual > Volunteering .
IF (FCTUDACT EQ 39) GENERAL_ACTIVITY = 10.
* Volunteering, Spiritual > Religious activities (including going to places
    of worship, praying etc.) .
IF (FCTUDACT EQ 40) GENERAL_ACTIVITY = 10.
* Hobbies incl relaxing > Did nothing, just relaxing, bored, waiting .
IF (FCTUDACT EQ 41) GENERAL_ACTIVITY = 11.
```

```
* Hobbies incl relaxing > Hobbies, arts and crafts, musical activities,
   writing stories, poetry etc. .
IF (FCTUDACT EQ 42) GENERAL_ACTIVITY = 11.
* Hobbies incl relaxing > Reading (not for school) .
IF (FCTUDACT EQ 43) GENERAL_ACTIVITY = 11.
* Hobbies incl relaxing > Other activities not listed .
IF (FCTUDACT EQ 44) GENERAL_ACTIVITY = 11.

IF SYSMIS(GENERAL_ACTIVITY) GENERAL_ACTIVITY = -1.

VARIABLE LABELS GENERAL_ACTIVITY 'TUD General Activity'.
VALUE LABELS GENERAL_ACTIVITY -1 'Mising or Other Activity'
1 'Sleep and personal care'
2 'Education related'
3 'Work'
4 'House chores'
5 'Eating and drinking'
6 'Physical exercise and sports'
7 'Travelling'
8 'Social events, outings'
9 'Digital media'
10 'Volunteering, Spiritual'
11 'Hobbies incl relaxing'.
MISSING VALUES GENERAL_ACTIVITY (-1).
FREQUENCIES GENERAL_ACTIVITY .

CROSSTABS GENERAL_ACTIVITY BY FCTUDACT .
```

## 5.2 STATA

```
* Sleep and personal care > Sleeping and resting (including sick in bed) .
gen GENERAL_ACTIVITY = 1 if (FCTUDACT == 1)
* Sleep and personal care > Personal care (including taking a shower/bath,
   grooming, getting dressed etc.) .
replace GENERAL_ACTIVITY = 1 if (FCTUDACT == 2)
* Education related > Homework .
replace GENERAL_ACTIVITY = 2 if (FCTUDACT == 3)
* Education related > In class .
replace GENERAL_ACTIVITY = 2 if (FCTUDACT == 4)
* Education related > School breaks .
replace GENERAL_ACTIVITY = 2 if (FCTUDACT == 5)
* Education related > School clubs .
replace GENERAL_ACTIVITY = 2 if (FCTUDACT == 6)
* Education related > Detention .
replace GENERAL_ACTIVITY = 2 if (FCTUDACT == 7)
* WORK > Paid work (including paid babysitting and paid work for the family
   ) .
replace GENERAL_ACTIVITY = 3 if (FCTUDACT == 8)
* WORK > Unpaid work for family or other non-household members (e.g. help
   in family business) .
replace GENERAL_ACTIVITY = 3 if (FCTUDACT == 9)
* House chores > Cooking, cleaning, and shopping for the household .
replace GENERAL_ACTIVITY = 4 if (FCTUDACT == 10)
```

```
* House chores > Fixing things around the house, fixing bike, gardening .
replace GENERAL_ACTIVITY = 4 if (FCTUDACT == 11)
* House chores > Looking after brothers, sisters, other children in the
   household .
replace GENERAL_ACTIVITY = 4 if (FCTUDACT == 12)
* House chores > Looking after parent or other adult in the households (
   medical or personal care) .
replace GENERAL_ACTIVITY = 4 if (FCTUDACT == 13)
* House chores > Pet care .
replace GENERAL_ACTIVITY = 4 if (FCTUDACT == 14)
* Eating and drinking > Eating or drinking in a restaurant or caf?? .
replace GENERAL_ACTIVITY = 5 if (FCTUDACT == 15)
* Eating and drinking > Eating a meal .
replace GENERAL_ACTIVITY = 5 if (FCTUDACT == 16)
* Eating and drinking > Eating a snack or having a drink .
replace GENERAL_ACTIVITY = 5 if (FCTUDACT == 17)
* Physical exercise and sports > Cycling .
replace GENERAL_ACTIVITY = 6 if (FCTUDACT == 18)
* Physical exercise and sports > Individual ball games and training (e.g.
   tennis, badminton) .
replace GENERAL_ACTIVITY = 6 if (FCTUDACT == 19)
* Physical exercise and sports > Jogging, running, walking, hiking .
replace GENERAL_ACTIVITY = 6 if (FCTUDACT == 20)
* Physical exercise and sports > Team ball games and training (e.g.
   football, hockey) .
replace GENERAL_ACTIVITY = 6 if (FCTUDACT == 21)
* Physical exercise and sports > Swimming and other water sports .
replace GENERAL_ACTIVITY = 6 if (FCTUDACT == 22)
* Physical exercise and sports > Other exercise and sports, dancing,
   keeping fit, skiing, gymnastics .
replace GENERAL_ACTIVITY = 6 if (FCTUDACT == 23)
* Travelling > Travel by bus, taxi, tube, plane .
replace GENERAL_ACTIVITY = 7 if (FCTUDACT == 24)
* Travelling > Travel by car, van (including vehicles owned by friends and
   family) .
replace GENERAL_ACTIVITY = 7 if (FCTUDACT == 25)
* Travelling > Travel by physically active means (walk, bike etc.) .
replace GENERAL_ACTIVITY = 7 if (FCTUDACT == 26)
* Social events, outings > Attending live sporting events .
replace GENERAL_ACTIVITY = 8 if (FCTUDACT == 27)
* Social events, outings > Cinema, theatre, performance, gig etc. .
replace GENERAL_ACTIVITY = 8 if (FCTUDACT == 28)
* Social events, outings > Exhibition, museum, library, other cultural
   events .
replace GENERAL_ACTIVITY = 8 if (FCTUDACT == 29)
* Social events, outings > Shopping (including window shopping, hanging out
    at shopping centre) .
replace GENERAL_ACTIVITY = 8 if (FCTUDACT == 30)
* Social events, outings > Speaking on the phone (including Skype, video
   calls) .
replace GENERAL_ACTIVITY = 8 if (FCTUDACT == 31)
* Social events, outings > Speaking, socialising face-to-face .
replace GENERAL_ACTIVITY = 8 if (FCTUDACT == 32)
* Digital media > Answering emails, instant messaging, texting .
```

```
replace GENERAL_ACTIVITY = 9 if (FCTUDACT == 33)
* Digital media > Browsing and updating social networking sites (e.g.
   Twitter, Facebook, BBM, Snapchat) .
replace GENERAL_ACTIVITY = 9 if (FCTUDACT == 34)
* Digital media > General internet browsing, programming (not time on
   social networking sites) .
replace GENERAL_ACTIVITY = 9 if (FCTUDACT == 35)
* Digital media > Listening to music, radio, iPod, other audio content .
replace GENERAL_ACTIVITY = 9 if (FCTUDACT == 36)
* Digital media > Playing electronic games and Apps .
replace GENERAL_ACTIVITY = 9 if (FCTUDACT == 37)
* Digital media > Watch TV, DVDs, downloaded videos .
replace GENERAL_ACTIVITY = 9 if (FCTUDACT == 38)
* Volunteering, Spiritual > Volunteering .
replace GENERAL_ACTIVITY = 10 if (FCTUDACT == 39)
* Volunteering, Spiritual > Religious activities (including going to places
    of worship, praying etc.) .
replace GENERAL_ACTIVITY = 10 if (FCTUDACT == 40)
* Hobbies incl relaxing > Did nothing, just relaxing, bored, waiting .
replace GENERAL_ACTIVITY = 11 if (FCTUDACT == 41)
* Hobbies incl relaxing > Hobbies, arts and crafts, musical activities,
   writing stories, poetry etc. .
replace GENERAL_ACTIVITY = 11 if (FCTUDACT == 42)
* Hobbies incl relaxing > Reading (not for school) .
replace GENERAL_ACTIVITY = 11 if (FCTUDACT == 43)
* Hobbies incl relaxing > Other activities not listed .
replace GENERAL_ACTIVITY = 11 if (FCTUDACT == 44)

replace GENERAL_ACTIVITY = -1 if (GENERAL_ACTIVITY == .)

label variable GENERAL_ACTIVITY "TUD General Activity"
label define GENERAL_ACTIVITY_labels -1 "Mising or Other Activity" 1 "Sleep
    and personal care" 2 "Education related" ///
  3 "Work" 4 "House chores" 5 "Eating and drinking" ///
  6 "Physical exercise and sports" 7 "Travelling" ///
  8 "Social events, outings" 9 "Digital media" ///
  10 "Volunteering, Spiritual" 11 "Hobbies incl relaxing"
label values GENERAL_ACTIVITY GENERAL_ACTIVITY_labels
tab GENERAL_ACTIVITY

tab FCTUDACT GENERAL_ACTIVITY
```

# 6 How to handle the data in the long format

There are two ways the data can be used. The first one would be to transform the dataset into wide format (cases to variables) where there is one variable for each slot (Slot_1, Slot_2, etc). The second way is to keep the data in the long format. Both ways will bring the same results, however, this section focuses on the second way. This is because it will provide you overall time spent in an activity (for example, sleeping) with less steps. n this section we provide you with syntax for the second solution.

Data users may be interested in aggregating the number of 10-minute slots in one activity spent by a Cohort Member. The syntax below can be used to count the 10-minute slots for each day of each Cohort Member of each family.

## 6.1 SPSS syntax

```
* generate a sleep variable .
IF (FCTUDACT EQ 1) sleeping = 1 .
IF sysmis(sleeping) sleeping = 0 .
FREQUENCIES sleeping.

* total sleeping per assigned day per Cohort Member per family .
AGGREGATE
 outfile = *
 overwrite = yes
 mode = addvariables
 /break = MCSID FCNUM00 FCTUDAD
 /total_sleeping = SUM(sleeping)
 /groupsize = N.
EXECUTE.

* perusal in one family .
* 10-minute slots of sleeping and not sleeping .
TEMPORARY.
SELECT IF (MCSID EQ "M10002P").
CROSSTABS FCTUDAD BY sleeping.
* total number of 10-minute slots of sleeping .
TEMPORARY.
SELECT IF (MCSID EQ "M10002P").
CROSSTABS FCTUDAD BY total_sleeping.
* total numbers that can get used for analysis
* user needs to keep one row per cohort member per assigned day .
TEMPORARY.
SELECT IF (MCSID EQ "M10002P").
FREQUENCIES total_sleeping.
```

## 6.2 STATA syntax

```
* generate a sleep variable .
gen sleeping = 1 if (FCTUDACT == 1)
replace sleeping = 0 if (FCTUDACT != 1)
```

```
tab sleeping

* total sleeping per assigned day per Cohort Member per family .
egen total_sleeping = count(sleeping) if sleeping == 1 , by (MCSID FCNUM00
   FCTUDAD)

* perusal in one family .
gen example_family = 1 if MCSID == "M10002P"
* 10-minute slots of sleeping and not sleeping .
tab FCTUDAD sleeping if example_family == 1
* total number of 10-minute slots of sleeping .
tab FCTUDAD total_sleeping if example_family == 1
* total numbers that can get used for analysis
* user needs to keep one row per cohort member per assigned day .
tab total_sleeping if example_family == 1



* Let's assume that different activity binary variables have been created
* LOOP FOR GENERATING VARIABLES SUITABLE FOR FOR ANALYSIS
foreach X of varlist act1 act2 act3 act4 act5 act6 act7 act8 act9 act10
   act11 act12 act13 act14 act15 act16 act17 act18 act19 act20 act21 act22
   act23 act24 act25 act26 act27 act28 act29 act30 act31 act32 act33 act34
   act35 act36 act37 act38 act39 act40 act41 act42 act43 act44 {

*generate total activity slots per day.
cap drop tot_`X'
egen tot_`X' = count(`X') if `X' == 1 , by (MCSID FCNUM00 FCTUDAD)
tab tot_`X'

*generate total activity slots per day (all time slots have this value)
cap drop day_`X'
egen day_`X' = max (tot_`X'), by (MCSID FCNUM00 FCTUDAD)
replace day_`X' = 0 if day_`X'==.

*generate total activity slots averaged over both days (all time slots have
    this value)
cap drop avg_`X'
egen avg_`X' = mean(tot_`X'), by (MCSID FCNUM00)
replace avg_`X' = 0 if avg_`X'==.

}
```

# 7 Further information

Further information on MCS is available from the CLS website (http://www.cls.ioe.ac.uk/mcs). CLS can also be contacted at the following email address: clsfeedback@ioe.ac.uk

The author would like to thank Emla Fitzsimons, Aida Sanchez, Aase Villasden, Emily Gilbert and Vilma Agalioti-Sgompou for their help on documenting the data.

## 7.1 Acknowledgement

For this report, the author(s) used *SPHINX - Python Documentation Generator* by Georg Brandl and the Sphinx team, version 1.3.1 http://sphinx-doc.org and in addition to the packages embedded by Sphinx, the report utilised the following LaTeX packages:

*graphicx*, *afterpage* and *color* by David Carlisle and the LaTeX Team
http://www.ctan.org/pkg/graphicx , http://www.ctan.org/pkg/afterpage ,
http://www.ctan.org/pkg/color
*tcolorbox* by Thomas F. Sturm http://www.ctan.org/pkg/tcolorbox
*xcolor* by Uwe Kern http://www.ctan.org/pkg/xcolor
*sectsty* by Rowland McDonnell http://www.ctan.org/pkg/sectsty
*geometry* by Hideo Umeki http://www.ctan.org/pkg/geometry
*tikz* by Till Tantau and Christian Feuers?nger http://www.ctan.org/pkg/pgf
*helvet* by Walter Schmidt http://www.ctan.org/pkg/helvet
*hyperref* by Heiko Oberdiek and Sebastian Rahtz http://www.ctan.org/pkg/hyperref
*datetime2* by Nicola Talbot https://www.ctan.org/tex-archive/macros/latex/contrib/datetime2