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**Workshop Exercises**

**WFRN 2018 Meeting**

Contents

[Exercise 1: Time Use Variables 3](#_Toc454361532)

[Exercise 2: Demographic Variables 4](#_Toc454361533)

[Exercise 3: Understanding the Data 5](#_Toc454361534)

[Exercise 4: Time Spent Working on Weekdays vs. Weekends 6](#_Toc454361535)

[Exercise 5:  Estimates of Time Spent Exercising 7](#_Toc454361536)

[Exercise 6:  Parent Time with Own Household Children 8](#_Toc454361537)

[Exercise 7:  Mothers' Child Care Time 9](#_Toc454361538)

[Exercise 8:  Participation in Various Activities by Hour of the Day 10](#_Toc454361539)

[Exercise 9: Understanding the Well-being Module 11](#_Toc454361540)

[Exercise 10: Spouse characteristics in ATUS-X 13](#_Toc454361541)

[Exercise 11: Understanding the ATUS eldercare data 15](#_Toc454361542)

[Exercise 12: Historical trends in US time use 16](#_Toc454361543)

[Exercise 13: Cross-country differences in paid work schedule and meals 17](#_Toc454361544)

[Exercise 14:  Estimates of Time Spent in Physical Activity in ATUS 18](#_Toc454361545)

[Exercise 15:  Estimates of Time Spent Volunteering Using Linked ATUS-CPS Data 19](#_Toc454361546)

# Exercise 1: Time Use Variables

In this exercise, you will become familiar with time use variable documentation on the ATUS-X site and the pieces that you can use to make time use variables. You will gather the information you will need to later create time use variables that capture participation in sports, exercise, and recreation at different times of the day both alone and with someone else.

**1) View the system-defined time use variables.** Click on "Time Use Variables" from the home page under "DATA."

Do any system-defined time use variables capture participation in sports, exercise, and recreation in the morning?

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**2) Learn more about time use variables.** Click on "About ATUS-X" from the home page. Jump down to "Creating and Selecting Time Use Variables." This section describes how to create time use variables in the ATUS-X system. For more information about what a time use variable is go to

<https://www.atusdata.org/atus/time_use_documentation.shtml>.

**a) Activities**

What major category includes participation in sports, exercise, and recreation? Hint: view the activity coding tree.

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**b) Filters (other activity-level characteristics)**

What filters are available from the system?

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What time use variable filters do you need to use to capture participation in sports, exercise, and recreation in the morning?

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Can you create a single time use variable that captures the time spent in participation in sports, exercise, and recreation from midnight to 6 a.m.?

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# Exercise 2: Demographic Variables

In this exercise, you will become familiar with household- and person-level documentation on the ATUS-X site. You will learn which weights to use and when to use them and you will learn the difference between variables with and without the \_CPS8 suffix.

**1) View the "weight" variables available from the "person" drop-down menu on the ATUS-X site.**

Which weight variable is appropriate for creating estimates of time use from 2003 to 2012?

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Which weight variable is appropriate for creating estimates of time use for Eating and Health Module respondents?

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Which replicate weights should be used with WT06?

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**2) View** **the "work status" variables from the "person" drop-down menu on the ATUS-X site**.

**EMPSTAT vs. EMPSTAT\_CPS8**

When is EMPSTAT collected?

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What is the universe for EMPSTAT?

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When is EMPSTAT\_CPS8 collected?

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What is the universe for EMPSTAT\_CPS8?

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# Exercise 3: Understanding the Data

\*Create an extract including the following samples: 2003 and 2008 and the following variables: ACT\_WORK (TUV), DAY, YEAR.

**1) Distinguishing between data samples (years)**

Your analyses will compare estimates of time spent working in 2003 and 2008. To determine the total number of cases in each year, run a frequency on the year of participation in the ATUS (YEAR).

How many individuals are in the 2003 sample? \_\_\_\_\_\_\_\_

How many individuals are in the 2008 sample? \_\_\_\_\_\_\_\_

**2) Create WEEKDAY to distinguish between weekdays and weekends.**

**3) Weekdays vs. Weekends and the Importance of Weights**

**3a. Get frequencies of the newly created WEEKDAY variable by sample.**

How many survey respondents completed the survey on a weekday during each sample year?

2003\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2008 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What percentage of individuals completed the survey on a weekend during each sample year?

2003\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2008 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**3b. Redo the analysis with the weight variable (WT06) to get accurate estimates.**

You will want to modify the commands in 3a. Because the ATUS has a complex survey design, you need to use the survey commands in Stata.

Using weights, what percentage of individuals completed the survey on a weekend during each sample year?

2003\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2008 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Exercise 4: Time Spent Working on Weekdays vs. Weekends

**4a. Click on the ACT\_WORK variable name (Build an extract🡪Time Use🡪Activity coding structure🡪ACT\_WORK) so you know what types of activities are included in this time use variable.**

**4b. Get the mean number of minutes respondents spent working by WEEKDAY.**

Using weights, what was the mean number of minutes worked on weekdays vs. weekends?

weekday\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ weekend\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**4c. Redo the analysis, excluding those who did not report doing any work on their diary day.**

Using weights, what was the mean number of minutes worked on weekdays vs. weekends?

weekday\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ weekend\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**4d. See how time spent working varies by day of the week and sample.**

Using weights, what was the mean number of minutes worked by day of the week and sample among those who reported *any* work on their diary day?

2003: weekday\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ weekend\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2008: weekday\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ weekend\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Exercise 5:  Estimates of Time Spent Exercising

For this exercise, your objective is to create estimates of average time per day spent exercising for men and women aged 25 to 64 during 2006, broken out by time of day and by whether the person was alone or in the company of others while exercising, as specified in the Excel table shell for exercise 5.  For this purpose, exercise includes any activity in the activity category of "Participating in Sports, Exercise, or Recreation**"** (second tier activity category 130100).

Select the 2006 sample and the rectangular data option in ATUS-X.  You will need to use both the time-of-day and the with-whom filters to create the appropriate time use variables.  Note that the ATUS-X time-of-day filter is not designed to produce time use variables that include time both at the beginning and at the end of the diary day.  In other words, it is not designed to define time use variables for time periods that begin before 4 a.m. and end after 4 a.m.  To produce estimates of time spent exercising at night, where night is defined to include the hours between 6 p.m. and 6 a.m., you must create two separate time use variables and sum them.  The time use variables you should create include

* Morning exercise (6 a.m. to noon)
* Afternoon exercise (noon to 6 p.m.)
* Night exercise (6 p.m. to 6 a.m.) (note that two time use variables must be created and summed)
  + exercise between 6 p.m. and 4 a.m.
  + exercise between 4 a.m. and 6 a.m.

A data set containing as few as 8 time use variables would be sufficient to fill in the rows and columns of Table 5.  You could, for example, create time use variables for time spent exercising alone and time spent exercising in the company of others for each of four time intervals, and use those to calculate the other values needed to complete the table.  Bec ause more generally it is a good idea to calculate sums directly as a check on more disaggregated calculations, we suggest that you also create variables that include all time spent exercising during the day and variables that include all time spent exercising regardless of whether alone or in the company of others.  If you do this, you will need to create a total of 15 time use variables.  
  
In addition to the 15 time use variables, your data set should include the sex and age of each respondent and the day of the week for which time use information was collected.  You also will need to include WT06, the estimation weight variable, on your data set.  WT06 is included by default when you create an extract.  
  
Once you have created a suitable extract, you will write a program to create the estimates needed to populate Table 5.  Solutions to the exercise, including sample programs, are available in the answers packet so that you can check your work.

# Exercise 6:  Parent Time with Own Household Children

For this exercise, your objective is to create estimates of the time that parents spend with their *own household children* in different types of activities.  For this purpose, only households in which the ATUS respondent has *at least one own child under the age of 18* will be analyzed.  As shown in Table 6, estimates should be produced for women who are not married, married women and married men, in each case by level of educational attainment.  For married women and married men, separate estimates should be produced for time with own household children with spouse present (with whom “all”) and own time with children without spouse present.   The activities of interest are direct physical care of children (activity code 030101); reading, playing and teaching (activity codes 030102, 030103, 030104, 030105, 030106, 030107, 030201, and 030203); time watching television (activity codes 120303 and 120304); and all other activities not previously listed.    
  
Again, select the 2006 sample and the rectangular data option in ATUS-X.  You will need to use the with-whom filter to define the time use variables needed for this exercise.

A data set containing as few as 8 time use variables would be sufficient to fill in the rows and columns of Table 6.  As with Table 5, however, we suggest that you create the time use variables needed to fill in all of the cells directly, so that you have a check on your numbers.  If you do this, you will need to create a total of 15 time use variables.  
  
In addition to the 15 time use variables, your data set should include a variable that tells you whether the household includes at least one own child of the respondent under age 18 ([KIDUND18](https://www.atusdata.org/atus-action/variables/KIDUND18)),respondent's sex (SEX), presence of spouse (SPOUSEPRES) and education level (EDUC) for each respondent; and WT06, the estimation weight.

Once you have created a suitable extract, you will write a program to create the estimates needed to populate Table 6.  Solutions to the exercise, including sample programs, are available in the answers packet so that you can check your work.

# Exercise 7:  Mothers' Child Care Time

For this exercise, your objective is to create estimates using 2006 data that show the relationship between mothers' child care time and the age of youngest household child, by the marital status of the mother and the presence of adult relatives other than a spouse in the household.  For this purpose, child care time is time spent in activity 030100 (caring for and helping household children).  An adult relative may be a parent, brother or sister, or other relative age 25 or older. Mothers are defined as women who have an own household child under 18 in the home.

For this exercise, select the 2006 sample and the "respondents and members of their household" data option in ATUS-X.   The household member records in the data file may be used to identify whether an adult relative of the respondent is co-resident. There is a household-level variable in the ATUS-X that you may use to create a categorical variable indicating the age of youngest household child.

The only time use variable you need is a variable that measures the time the respondent devotes to care of household children.   You also should select person-level variables that tell you whether the woman has a co-resident own child under 18 in the household; the age of the youngest child under 18 in the household; the sex and age of each household member, the relationship of each person to the ATUS respondent, and the presence of a spouse (vs. not); and WT06, the estimation weight.

Once you have the data file, you will use all of the person records for each household to create a dummy variable for whether the household in which the respondent resides does or does not include an adult relative of the respondent.

Once you have created a suitable extract, you will write a program to create the estimates needed to populate Table 7.  Solutions to the exercise, including sample programs, are available in the answers packet so that you can check your work.

# Exercise 8:  Participation in Various Activities by Hour of the Day

For this exercise, your objective is to create estimates using 2006 data that show the fraction of the population who are engaged in different activities during each hour of the day.  You will code activities into four categories: 1) sleeping (activity code 010101); 2) working (activity codes from 050101 to 059999); 3) leisure and sports (activity codes from 120101 to 139999); and 4) all other activities.  As shown in Table 8, you would like to know whether the respondent spent any time engaged in each of the four activities during each hour of the day.  Note that the shares of people engaged in the different activities may sum to more than 100 percent, since some people may have engaged in more than one of the four types of activities during any given hour.    
  
For this exercise, select the 2006 sample and the hierarchical data option in ATUS-X.  Selecting the hierarchical data will give you household-level records, person-level records, activity-level records and who-level records.  It is possible to generate the estimates for Table 8 directly using the ATUS-X system but since 96 different time use variable would be required (4 activities times 24 hours of the day), this would be tedious.  Hierarchical data can be considerably more efficient to work with when a very large number of time use variables must be created.  Check to confirm that WT06 is included in your data.

Once you have the hierarchical data ready to analyze, you will use your statistical package to create the variables needed for your analysis.  You will need to look at each activity record for a person in turn, determine whether the activity was in progress during the first hour of the day (4:01 a.m. through 5:00 a.m.), the 2nd  hour of the day (5:01 a.m. through 6:00 a.m.), and so on through the 24th hour of the day (3:01 a.m. to 4:00 a.m.) and whether the activity should be classified as sleeping, working, playing or something else.  You should create a set of 96 indicator variables based on these determinations.  For example, Sleep5 might take a value of 1 if the person reported any sleep in the hour from 4:01 a.m. to 5:00 a.m., 0 otherwise; Sleep6 might should take a value of 1 if the person reported any sleep during the hour from 5:01 a.m. to 6:00 a.m..; and so on.   Because there are so many variables to be created, the most efficient strategy is to use loops to create them.  If you are not familiar with using loops, try writing the code to create just a few of the required variables. Looking for repetitiveness in the way variables are created will help you see how you might automate the process. We provide our versions of the loops with the solutions.

The hard part of this exercise is creating the indicator variables.  Once they have been created, you need only calculate their weighted mean values.  A weighted mean value of 0.920, for example, implies that 92.0 percent of the population engaged in the given activity during the hour in question.

Solutions to the exercise, including sample programs, are available in the answers packet so that you can check your work.

# Exercise 9: Understanding the Well-being Module

In this exercise, you will become familiar with the data from the well-being module. You will also compare estimates of well-being during sports (activity codes 130101 - 139999) and paid work and work-related activities (activity codes 050101 - 059999) and you will examine age and gender differences in affect during paid work activities.

Create a hierarchical extract including the 2010 sample, activity-level well-being data, and AWBWT, the activity-level well-being module estimation weight, as well as person-level characteristics to make gender comparisons and WBWT, the person-level well-being module estimation weight.

**1) Examine frequencies of the six subjective well-being items.**

**1a. Understanding subjective well-being coding: HAPPINESS and STRESS.**

In how many *activities* do respondents report being 'very happy'? \_\_\_\_\_\_\_\_

In how many *activities* do respondents report being 'very stressed'? \_\_\_\_\_\_\_\_

**1b. Why are so many records coded as 'NIU (Not in universe)'?**

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**1c. How many activity records have subjective well-being data available?**

\_\_\_\_\_\_\_\_

**2) Recode NIU as missing.**

**3) Generate weighted means for the six subjective well-being items using AWBWT. Solutions to the exercise, including sample programs, are available in the answer packet so that you can check your work.**

**4) Interpret the mean for happiness.**

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**5) Generate weighted means and unweighted N's for each subjective well-being measure during sports, exercise, and recreation and during work and work-related activities. Using the extract you used to answer the previous questions in this exercise, write a program to create the estimates needed to populate Table 9.  Solutions to the exercise, including sample programs, are available in the answers packet so that you can check your work.**

**6) Generate weighted person-level estimates using WBWT of average subjective well-being (for each of the six well-being measures) for men and women aged 25 to 64 during paid work and work-related activities.**

The well-being module respondent reports his or her subjective well-being for (up to) three randomly selected *activities*. The number of work activities that also have subjective well-being reports will range from zero to three. This occurs because the well-being module data are on activity records rather than person records. For each subjective well-being variable, you will need to create a *person-level average* assessment of well-being during paid work.

You may pursue one of two strategies to accomplish this work. You may either work with the activity-level data and create summary measures which you then merge with the person-level data or you may rectangularize/transpose/reshape the data so it is at the person level.

Solutions to the exercise, including sample programs, are available in the answer packet so that you can check your work.

# Exercise 10: Spouse characteristics in ATUS-X

The aims of this exercise are to become familiar with 1) thinking about how to leverage the rich information available in the ATUS about respondents and household members, 2) creating couple-level variables, and 3) analyzing couple-level data. While the ATUS only collects time use information for one member of each surveyed household, sociodemographic information is obtained for all the members of the household. ATUS-X provides the following characteristics about the ATUS respondent's spouse: age, sex, race, Hispanic origin, educational attainment, spouse employed, employment status, usual work hours and weekly earnings. *Note that when analyzing couple-level characteristics from the ATUS, you may need to keep in mind whether the respondent is male or female.*

Create a rectangular extract including ATUS respondents and household members for the 2012 sample along with the following variables: time spent in household activities (ACT\_HHACT), individual characteristics (AGE, SEX, EDUC, EMPSTAT), and spouse characteristics (SPOUSEPRES, SPAGE, SPSEX, SPSPEDUC, SPEMPSTAT).

1. Get the characteristics of the sample.

* How many couples are in the sample? \_\_\_\_\_\_\_\_
* How many respondents are male? \_\_\_\_\_\_\_\_ Female? \_\_\_\_\_\_\_\_
* What proportion of respondents are employed? \_\_\_\_\_\_\_\_
* What proportion of spouses are employed? \_\_\_\_\_\_\_\_
* What proportion of couples both members have the same educational attainment (1: less than HS diploma, 2: HS diploma, no college, 3: Some college, 4: college degree or higher)? \_\_\_\_\_\_\_\_

1. Only for heterosexual couples, create couple-level variables based on the age, employment status, and educational attainment of both members of the couple.

* Couple-level variables:
  + CAGE: male is 5 years older than female, difference is less than 5 years, female is 5 years older than male
  + CEMPSTAT: both employed (dual-earner couples), only male is employed (male breadwinner couple), only female is employed (female breadwinner couple), neither is employed
  + CEDUC: male has more education than female (hypergamy), both have same level of education (homogamy), female has more education than male (hypogamy)
* How many dual earner couples are there in the sample? \_\_\_\_\_\_\_\_ Male breadwinner? \_\_\_\_\_\_\_\_
* In how many couples is the male older than the female by 5 or more years? \_\_\_\_\_\_\_\_
* How many hypergamous couples are there in the sample? \_\_\_\_\_\_\_\_ Hypogamous? \_\_\_\_\_\_\_\_

(Hypergamous- men have more education than women; hypogamous- women have more education than men)

1. Compare time spent in household activities based on the characteristics of the couples.

* What is the mean number of minutes spent in household activities for:
  + men in dual-earner couple arrangements? \_\_\_\_\_\_\_\_
  + women in dual-earner couple arrangements? \_\_\_\_\_\_\_\_
* What is the difference between men's and women's time spent in household activities when:
  + men are older than their wives? \_\_\_\_\_\_\_\_
  + wives are older than their husbands? \_\_\_\_\_\_\_\_
  + husbands and wives are within five years of one another? \_\_\_\_\_\_\_\_
  + men are more educated than their wives? \_\_\_\_\_\_\_\_
  + women are more educated than their husbands? \_\_\_\_\_\_\_\_
  + husbands and wives have the same level of education? \_\_\_\_\_\_\_\_

# Exercise 11: Understanding the ATUS eldercare data

In this exercise, you will become more familiar with the eldercare data in the ATUS. You will analyze the variables collected by the module and you will also explore differences in time use by eldercare providers and non-providers.

Eldercare information is collected at two levels: person (P) and eldercare recipient (R). P records contain information from the ATUS respondent about eldercare provision. Eldercare recipient records contain information about the individuals to whom the ATUS respondent provided care. Eldercare recipient records are not available in ATUS-X yet, but the data may be [downloaded from ATUS-X for use](https://www.atusdata.org/atus/eldercare_registers.shtml).

Create an extract that includes all samples with eldercare information. Create and extract the following time use variables: one each for time spent in personal care (010000), social activities (120000), care for adults (030400, 030500, 040400, 040500). and secondary eldercare (filter secondary activity, without care for adults). You will also need to extract all of the person-level variables about eldercare.

Examining person-level eldercare variables

1. How many respondents in each year (2011-2014) provided eldercare in the last 3 months? 2011:\_\_\_\_\_\_ 2012:\_\_\_\_\_\_ 2013:\_\_\_\_\_\_ 2014:\_\_\_\_\_\_ What proportion of providers provided eldercare about once a week or more? 2011:\_\_\_\_\_\_ 2012:\_\_\_\_\_\_ 2013:\_\_\_\_\_\_ 2014:\_\_\_\_\_\_
2. In 2011, among those who provided eldercare the day before the interview, how much time do they spend in secondary eldercare? \_\_\_\_\_\_ How much time do at least weekly providers spend? \_\_\_\_\_\_
3. In 2014, considering those who provided eldercare at least weekly, how much time do they spend in personal care and social activities? Personal care:\_\_\_\_\_\_ Social activities:\_\_\_\_\_\_ What about those who didn’t provide eldercare in the last 3 months? Personal care:\_\_\_\_\_\_ Social activities:\_\_\_\_\_\_

Examining eldercare recipient-level data. Merge the eldercare recipient data (R records) to the ATUS respondent data file (P records). You want to preserve information from all respondents, even if they haven’t provided eldercare.

1. How many respondents have provided eldercare for more than one person? \_\_\_\_\_\_
2. How many respondents have provided eldercare for at least 1 year? \_\_\_\_\_\_
3. Create a new category for caregivers who provide eldercare to spouse or partner 65 years old or more. How much time do they spend in personal care and social activities? Personal care:\_\_\_\_\_\_ Social activities:\_\_\_\_\_\_

# Exercise 12: Historical trends in US time use

Using information from the American Heritage Time Use Survey (AHTUS), you will analyze trends in time use in the US during the last five decades. In AHTUS-X, create an extract including 1965, 1975, 1985, 1995, 2005 and 2012 samples. Include the following variables in the extract: SEX, AGE, CIVSTAT, EMPSTAT, UNDER18, and RECWGHT. Also include time use variables for paid work, unpaid domestic work, primary childcare, secondary (but not primary) childcare.

1. Estimate minutes in paid work by year from 1965-2012 for the full sample and the employed respondents only.
2. Estimate the gender gap in unpaid work by year from 1965-2012 for the full sample and the respondents who are in a union.
3. Estimate the time spent in each of primary childcare and secondary childcare for mothers and fathers by year from 1965-2012. Note that secondary childcare is limited in the historical samples.

# Exercise 13: Cross-country differences in paid work schedule and meals

Using information from MTUS-X, you will analyze patterns of paid work and meals in four countries. Create an extract with the 2005 samples for US, UK and Netherlands and 2009 for Spain. Create and include in your extract the following TUVs:

* Total time spent in paid work (predefined)
* Time spent in paid work between 6am and 2pm
* Time spent in paid work between 2pm and 10pm
* Time spent in paid work between 10pm and 6am
* Total time spent in meals during the day
* Time spent in meals between 11am and 1pm
* Time spent in meals between 1pm and 3pm
* Time spent in meals between 5 pm and 8pm
* Time spent in meals between 8pm and 11pm

Select also the day of the week and the employment status of the respondent.

1. Compute the average minutes spent in paid work for each country and by weekend/weekday diary for the entire sample and full-time employees only.
2. Compute the average minutes spent in paid work during the morning, afternoon, and night for each country for the entire sample and full-time employees only.
3. Calculate the average time spent in meals for each country and document differences in the timing of meals during the day across countries.

# Exercise 14:  Estimates of Time Spent in Physical Activity in ATUS

With time use data, physical activity can be defined in several ways. We will create different measures of physical activity and see how sensitive the measurement is to the patterns we observe in the data. Your objective in this exercise is to create time use variables from the ATUS activity-level data, to consider different ways to measure physical activity in the ATUS, and to explore associations between BMI, health, and physical activity.

The **first step** in the process is to create a dataset that contains only the respondents who participated in the Eating and Health Module of the ATUS (***hint***: use the module selection on the samples page to identify the years in which the module was fielded). Make sure to include in your extract the BMI and general health status variables along with the appropriate weight to use when analyzing Eating and Health Module data (EHWT). Because we're going to create time use variables from the activity-level data, make sure your extract is hierarchical and you choose the necessary variables to construct time use variables based on mode of transportation, activity, and metvalues associated with activities. The time use variables you should create are:

1. Time spent in exercise (ACTIVITY=1302XX)
2. Time spent walking or biking as a mode of transportation (WHERE=232 or 235)
3. Time spent in exercise or walking/biking as a mode of transportation
4. Time spent in moderate activities (METVALUE>=3 & METVALUE<6)
5. Time spent in vigorous activities (METVALUE>=6 & METVALUE<999)
6. Time spent in moderate or vigorous activities

The **second step** is to create a person-level file. First, recode the BMI and general health status variables. BMI should be coded into four categories (normal [19-24], overweight [25-29], obese [30-39], extreme obesity [40+]) and don't forget to set the missing data to missing. For general health status, set the missing data to missing. Second, merge the time use variables from the activity-level file with the person-level data.

The **third step** is to generate mean minutes of each type of physical activity by BMI and general health status and populate Table 14. Don't forget to use EHWT rather than WT06 since you're using variables collected as part of the Eating and Health Module.

# Exercise 15:  Estimates of Time Spent Volunteering Using Linked ATUS-CPS Data

Your objective in this exercise is to link ATUS and CPS data, merge in appropriate weights, and create estimates of the percent of ATUS respondents volunteering per day, of the average time per day spent volunteering, and of the average time per day spent volunteering conditional on volunteering in the ATUS. All estimates are for the full sample and for individuals in the CPS Volunteer supplement who are volunteers (or not) (see Excel table shell for exercise 15).  For this purpose, volunteering includes any activity in the activity category of "Volunteer activities**"** (first tier activity category 150000).

Completing this exercise requires creating two extracts (one from ATUS-X and one from IPUMS-CPS) and ***linking*** ATUS-X and IPUMS-CPS data. In ATUS-X, select the 2006-2008 ATUS samples and the rectangular data option. Be sure to include CPSID, YEAR\_CPS8, and MONTH\_CPS8 from the “Technical Household” variables as well as your volunteering time use variable. Note that the 2008 ATUS sample is included because individuals enter the ATUS sample 2-5 months after completing the CPS (in this case September-December). In IPUMS-CPS (be sure to register), choose the 2006 and 2007 volunteer supplement samples (both from September) and VLSTATUS from the “Volunteer Supplement” variables as well as MISH, MONTH, and YEAR from the “Technical Variables” under Household and CPSIDP under Person “Linking” variables.

The **first step** in the process is to create a dataset that contains only the ATUS respondents who should have been in the CPS volunteer supplement in MIS 5-8 in September of 2006 or 2007. To figure out which ATUS respondents ***should*** link to the CPS volunteer supplement, recall that ATUS respondents are a subsample of CPS respondents, so not everyone in CPS will link to the ATUS. And, because of the CPS rotation pattern (4-8-4 – see the next page for a visual), not all ATUS respondents will be in every month of the CPS. A technical detail: some ATUS respondents will be in both the 2006 and 2007 CPS volunteer supplement. For this analysis, identify only the ATUS respondents who were in the CPS volunteer supplement in MIS 5-8. *Hint*: use MONTH\_CPS8 and YEAR\_CPS8 and don’t forget that these month/year combinations refer to the ATUS respondent’s 8th month of participation in the CPS.

The **second step** in the process is to create a dataset that contains only the CPS respondents who were in the CPS volunteer supplement in MIS 5-8 in September of 2006 or 2007; these are the CPS respondents you will keep in the dataset to link to the ATUS. Note: retain ***only*** the CPS respondents who are in the volunteer supplement during MIS 5-8.

The **third step** in the process is to prepare the weights files. The 2006 and 2007 files contain the adjusted weights (ADJ\_WGT) we need for the analysis of the linked sample. The [documentation](https://internal.atusdata.org/atus/resources/linked_docs/linked_generic.pdf) will help you understand which variables are created specifically for the linked file. Put the files together (append them in Stata speak) and keep only the cases you think you need for merging in the next step. ***Note***: Restrict your file to include only the CPS respondents who have a LINENO value of 1 (these are the ATUS respondents; LINENO was added to this file by ATUS-X staff). And, don't forget that you're only interested in the ATUS respondents who participated in the CPS Volunteer supplement in MIS 5-8. The MISH variable from ATUS-X and IPUMS-CPS is called HRMIS in the linked file.

The **fourth step** in the process is to merge the ATUS-X and IPUMS-CPS files you created in steps 1 and 2 together (using CPSIDP) and to then merge in the adjusted weights from the "linked file" (<https://www.atusdata.org/atus/cpslink.shtml#vol>) for 2006 and 2007 (using CASEID). ADJ\_WGT is the weight variable you should use to generate your estimates.

Once you have created a suitable extract from both ATUS-X and IPUMS-CPS and merged the extracts with the adjusted weights, the **fifth step** is to create the estimates needed to populate Table 15.  Solutions to the exercise, including sample programs, are available in the answers packet so that you can check your work.



Note: The highlighted cells represent the cohorts that you want to include in your analysis. Identify the individuals in these cohorts in both the ATUS and CPS and restrict your files to these cases only before trying to link the ATUS and CPS files.