

Workshop on Time Use Data for Sociological Research
Exercise 7

Sandra Hofferth and Liana Sayer
Maryland Population Research Center
University of Maryland

American Sociological Association,
August 13, 2019

Exercise 7: Estimates of Time Spent in Physical Activity in ATUS Well-being Module

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 (6) 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 MET values associated with activities. The time use variables you should create are:

1. Time spent in exercise (ACTIVITY=130100)
2. Time spent walking or biking as a mode of transportation (WHERE=232 or 235)
3. Time spent in walking or biking as exercise
4. Time spent in moderate activities (METVALUE \geq 3 & METVALUE $<$ 6)
5. Time spent in vigorous activities (METVALUE \geq 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 five categories (underweight [low-18], 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, create the time use variables and 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 7_codes. Estimates of Time spent in physical activity in ATUS well-being module

A. SAS syntax

Separate data into person and activity records, create new activities, and remerge files

```
data ipums.act;
  set IPUMS.atu0021;
  if rectype ne 3 then delete;
run;
```

```
data ipums.resp;
  set ipums.atu0021;
  if rectype ne 2 then delete;
run;
```

```
data ipums.actsum;
  set ipums.act;
  by caseid;
  retain modact vigact modvigact totact;
  if first.caseid then do;
    modact = 0;
    vigact = 0;
    modvigact = 0;
    totact = 0;
  end;

  if 3 <= metvalue < 6 then modact + duration;
  if 6 <= metvalue < 900 then vigact + duration;
  if 3 <= metvalue < 900 then modvigact + duration;
  totact + duration;

  if last.caseid then output ipums.actsum;
  keep caseid modact vigact modvigact totact;
run;
```

```
proc means;
  var modact vigact modvigact totact;
run;
*/
```

```
proc sort data = ipums.actsum;
  by caseid;
run;
proc sort data = ipums.resp;
  by caseid;
run;
data ipums.respect;
merge ipums.resp ipums.actsum;
by caseid;
run;
```

Recode variables and Produce tables

```
data temp;
  set IPUMS.respect;

  if genhealth>5 then genhealth=.;

  twalkbike = sum (walkbike_nottrans, walkbike_trans);

      if 10 < BMI < 19 then bmicat = 1;
  else if 18 < bmi < 25 then bmicat = 2;
      else if 24 < bmi < 30 then bmicat = 3;
  else if 29 < BMI < 40 then bmicat = 4;
      else if 39 < bmi < 999 then bmicat = 5;
  else bmicat = .;

*exercise_tot = exercise_tot;

proc means;
var bmicat genhealth exercise_tot walkbike_nottrans walkbike_trans modact
vigact modvigact;
weight ehwt;
run;

proc sort;
  by bmicat;
  proc means;
    var exercise_tot walkbike_nottrans walkbike_trans modact vigact
modvigact;
    weight ehwt;
  by bmicat;
  run;

proc sort;
  by genhealth;
  proc means;
var exercise_tot walkbike_nottrans walkbike_trans modact vigact modvigact;
weight ehwt;
  by genhealth;
  run;
```

B. Stata syntax

```
/*1. run extract*/
quietly do atus_00451.do;
save extract_hier.dta, replace;

/*2. activity data*/
keep if rectype==3;

/*keep only activity-level variables*/
keep caseid actline duration where activity metvalue;

/*flag activities of interest*/
gen _onlyex=duration if (activity>=130000 & activity<130200);
gen _onlywkbk=duration if (where==232 | where==235);
gen _wkbkex=duration if (where==232 | where==235) | (activity>=130000 & activity<130200);
gen _modmet=duration if metvalue>=3 & metvalue<6;
gen _vigmet=duration if metvalue>=6 & metvalue<999;
gen _anymet=duration if metvalue>=3 & metvalue<999;

/*summarize time during activities of interest*/
egen onlyex=sum(_onlyex),by(caseid);
egen onlywkbk=sum(_onlywkbk),by(caseid);
egen wkbkex=sum(_wkbkex),by(caseid);
egen modmet=sum(_modmet),by(caseid);
egen vigmet=sum(_vigmet),by(caseid);
egen anymet=sum(_anymet),by(caseid);

/*retain only the first activity record and variables for merging with the person record*/
keep if actline==1;
keep caseid actline onlyex onlywkbk wkbkex modmet vigmet anymet;

sort caseid;
save activity.dta, replace;

/*2. person variables*/
clear;
use extract_hier.dta;

/*keep only person-level data*/
keep if rectype==2;
```

```
/*keep only person-level variables*/
drop activity-actlinew;

/*recode BMI and HEALTH*/
gen bmicat=.;
    replace bmicat=1 if bmi>=19 & bmi<=24;
    replace bmicat=2 if bmi>=25 & bmi<=29;
    replace bmicat=3 if bmi>=30 & bmi<=39;
    replace bmicat=4 if bmi>=40 & bmi<=998;

gen health=.;
    replace health=genhealth if genhealth<96;

sort caseid;
save person.dta, replace;

/*3. merge files*/
merge 1:1 caseid using activity.dta;
save act_person_merge.dta, replace;

/*4. analysis*/
svyset [weight=ehwt];

foreach v in onlyex onlywkbk wkbkex modmet vigmet anymet {;
    svy: mean `v', over(bmicat);
    svy: mean `v', over(health);
};
```

C: SPSS Syntax

*****Define characteristics.

```
COMPUTE exercise=0.  
IF ACTIVITY GE 130000 AND ACTIVITY LT 130200 exercise=duration.
```

```
COMPUTE walk_bike=0.  
IF WHERE=232 OR WHERE=235 walk_bike=duration.
```

```
COMPUTE ex_walk_bike=0.  
IF (ACTIVITY GE 130000 AND ACTIVITY LT 130200) OR WHERE=232 OR WHERE=235  
ex_walk_bike=duration.
```

```
COMPUTE moderate=0.  
IF METVALUE GE 3 AND METVALUE LT 6 moderate=duration.
```

```
COMPUTE vigorous=0.  
IF METVALUE GE 6 AND METVALUE LT 999 vigorous=duration.
```

*****Aggregate durations.

```
AGGREGATE  
/OUTFILE=* MODE=ADDVARIABLES  
/BREAK=CASEID  
/time_exercise=SUM(exercise)  
/time_walk_bike=SUM(walk_bike)  
/time_ex_walk_bike=SUM(ex_walk_bike)  
/time_moderate=SUM(moderate)  
/time_vigorous=SUM(vigorous).
```

```
SELECT IF rectype=2.
```

```
COMPUTE time_moderate_vigor=time_moderate+time_vigorous.
```

*****Recode BMI and Health.

```
COMPUTE BMI_group=0.  
IF bmi ge 19 and bmi lt 25 BMI_group=1.  
IF bmi ge 25 and bmi lt 30 BMI_group=2.  
if bmi ge 30 and bmi lt 40 BMI_group=3.  
if bmi ge 40 and bmi lt 998 BMI_group=4.  
if bmi =998 or bmi=999 BMI_group=9.
```

```
VAL LABEL BMI_group 1 'Normal'
```

2 'Overweight'
3 'Obese'
4 'Extreme obese'.

MISSING VALUES BMI_group (0,9).
MISSING VALUES GENHEALTH (96, 97,99).

*****Compute table.

WEIGHT BY EHWT.

MEANS TABLES=time_exercise time_walk_bike time_ex_walk_bike time_moderate
time_vigorous
time_moderate_vigor BY BMI_group GENHEALTH
/CELLS=MEAN.

Exercise 7. Minutes Per Day Spent in Physical Activity by BMI and Health, 2006-08, 2014-16.

	Total	Exercise:	Transport	Moderate	Vigorous	Moderate	N
BMI	Exercise	Walking, Biking	ation: Walking, Biking	Activities	Activities	or Vigorous Activities	
Underweight	20.2	3.9	4.1	47.2	10.2	57.4	1,764
Normal	24.6	5.0	3.9	84.0	7.3	91.2	22,685
Overweight	19.2	4.7	2.5	94.1	3.9	98.0	23,124
Obese	14.1	2.6	1.6	90.8	2.3	93.2	15,819
Extremely Obese	13.5	4.0	3.5	82.6	3.0	85.6	6,488
General Health Status							
Excellent	30.9	5.2	4.1	89.9	9.6	99.4	12,747
Very Good	23.4	5.2	2.5	90.0	5.4	95.5	23,523
Good	3.2	3.8	2.3	90.2	2.3	92.5	21,260
Fair	8.7	3.2	2.8	83.0	2.3	85.3	8,612
Poor	7.3	3.0	4.6	42.5	0.4	42.9	2,941