



# Lab Exercise #1: Linking Possibilities

## Learning goals

- Understand the 4-8-4 CPS rotation pattern
- Learn to use the IPUMS CPS Rotation Pattern Exploration Station (RoPES)
- Evaluate whether topical supplements can be combined
- Estimate the proportion of the sample that can be combined in different months
- Make sure month-in-sample values (using the household level variable MISH) look as expected for linkages

## Summary

In this exercise, you will explore the different types of linkages that are possible in the CPS using the IPUMS CPS RoPES. A month-to-month link is the simplest kind of link possible in the CPS. You can, for example, make this type of linkage using adjacent months of basic monthly data or combine information from different supplements in non-adjacent months. You may also create a full panel and observe a cohort of individuals each time they appear in the CPS.

*Future exercises will build on this work. Save any do files to your IPUMS flash drive. You may also choose to save extracted or modified data files locally.*

Part 1: Month-to-Month Linking

1. Can the 2015 Education supplement be linked to any ASEC supplement? \_\_\_\_\_
2. What topical supplements can be linked to the 2015 Education supplement?  
\_\_\_\_\_
3. What month contains the 2015 Veterans supplement? \_\_\_\_\_ The 2015 Volunteer supplement? \_\_\_\_\_
4. What fraction of the respondents in the month containing the 2015 Veterans supplement should link to the month containing the 2015 Volunteer supplement? \_\_\_\_\_

Now let's look at the data. Make an extract that includes the months in 2015 containing the Veteran and Volunteer supplements and CPSIDP, MISH, AGE, SEX, and RACE. Link people who appear in both of these months using CPSIDP.

5. What fraction of the respondents in August 2015 actually link to September 2015?  
\_\_\_\_\_
6. For respondents appearing in both months, what are MISH values in August?  
\_\_\_\_\_ How about in September? \_\_\_\_\_
7. Create two variables that report the value for an individual's MISH in August and September, respectively. Cross tabulate these two variables and fill in Table 1 below.

**Table 1**

|                   |   | September (Volunteer) |   |   |   |   |   |   |   |   |
|-------------------|---|-----------------------|---|---|---|---|---|---|---|---|
|                   |   | MISH                  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| August (Veterans) | 1 |                       |   |   |   |   |   |   |   |   |
|                   | 2 |                       |   |   |   |   |   |   |   |   |
|                   | 3 |                       |   |   |   |   |   |   |   |   |
|                   | 4 |                       |   |   |   |   |   |   |   |   |
|                   | 5 |                       |   |   |   |   |   |   |   |   |
|                   | 6 |                       |   |   |   |   |   |   |   |   |
|                   | 7 |                       |   |   |   |   |   |   |   |   |
|                   | 8 |                       |   |   |   |   |   |   |   |   |

8. What happened to the 1/4 of respondents who were in the August and September data but did not link? Why do they fail to link across these adjacent months?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Part 2: Full Panel Linking

9. As with a month-to-month linked file, a fully linked CPS panel will be smaller than a single-month cross-sectional sample. This full panel will be approximately what fraction of a cross-sectional CPS sample? \_\_\_\_\_
10. Create a full panel for those entering the CPS in August 2015. What months will you include in your extract? *Be sure to include the variables CPSIDP, MISH, AGE, SEX, and RACE.*  
\_\_\_\_\_
11. How many people begin the rotation pattern in August of 2015? \_\_\_\_\_
12. How many of those entering the survey in August of 2015 are still in the survey in the last month of participation in CPS? \_\_\_\_\_



Part 1: Month-to-Month Linking

1. Can the 2015 Education supplement be linked to any ASEC supplement? **No**
2. What topical supplements can be linked to the 2015 Education supplement?  
**2014 Tobacco Use, Veterans, Education, Voter, and Food Security supplements; 2015 Computer and Internet Use, Veterans, Volunteer, and Food Security supplements; 2016 Veterans, Education, Voter, and Food Security supplements.**
3. What month contains the 2015 Veterans supplement? **August** The 2015 Volunteer supplement? **September**
4. What fraction of the respondents in the month containing the 2015 Veterans supplement should link to the month containing the 2015 Volunteer supplement? **¾ or 75%**
5. What fraction of the respondents in August 2015 actually link to September 2015?  
**~70.5%**
6. For respondents appearing in both months, what are MISH values in August? **1, 2, 3,5,6,7.** How about in September? **2,3,4, 6, 7,8**
7. Create two variables that report the value for an individual’s MISH in August and September, respectively. Cross tabulate these two variables and fill in Table 1 below.

**Table 1**

|                   |   | September (Volunteer) |               |               |               |   |               |               |               |   |
|-------------------|---|-----------------------|---------------|---------------|---------------|---|---------------|---------------|---------------|---|
|                   |   | MISH                  | 1             | 2             | 3             | 4 | 5             | 6             | 7             | 8 |
| August (Veterans) | 1 | 0                     | <b>14,838</b> | 0             | 0             | 0 | 0             | 0             | 0             | 0 |
|                   | 2 | 0                     | 0             | <b>15,375</b> | 0             | 0 | 0             | 0             | 0             | 0 |
|                   | 3 | 0                     | 0             | 0             | <b>15,432</b> | 0 | 0             | 0             | 0             | 0 |
|                   | 4 | 0                     | 0             | 0             | 0             | 0 | 0             | 0             | 0             | 0 |
|                   | 5 | 0                     | 0             | 0             | 0             | 0 | <b>15,105</b> | 0             | 0             | 0 |
|                   | 6 | 0                     | 0             | 0             | 0             | 0 | 0             | <b>15,587</b> | 0             | 0 |
|                   | 7 | 0                     | 0             | 0             | 0             | 0 | 0             | 0             | <b>15,276</b> | 0 |
|                   | 8 | 0                     | 0             | 0             | 0             | 0 | 0             | 0             | 0             | 0 |

8. What happened to the other ¼ of respondents who were in the August and September data but do not link? Why do they fail to link across these adjacent months?  
**Those respondents in MIS 4 in the Veterans supplement (August) begin the 8-month break in September and those in MIS 8 in the Veterans supplement exit the CPS forever in September. These respondents are replaced in the Volunteer supplement by a new cohort entering the CPS for the first time (MIS 1) and another re-entering the CPS after their 8-month break (MIS 5).**



## Part 2: Full Panel Linking

9. As with a month-to-month linked file, a fully linked CPS panel will be smaller than a single-month cross-sectional sample. This full panel will be approximately what fraction of a cross-sectional CPS sample? 1/8
10. Create a full panel for those entering the CPS in August 2015. What months will you include in your extract? *Be sure to include the variables CPSIDP, MISH, AGE, SEX, and RACE.* August-November 2015 and August-November 2016
11. How many people begin the rotation pattern in August of 2015? 15,891
12. How many of those entering the survey in August of 2015 are still in the survey in the last month of participation in the CPS? 11,694

