Session 1: Describing Data and Data Manipulation

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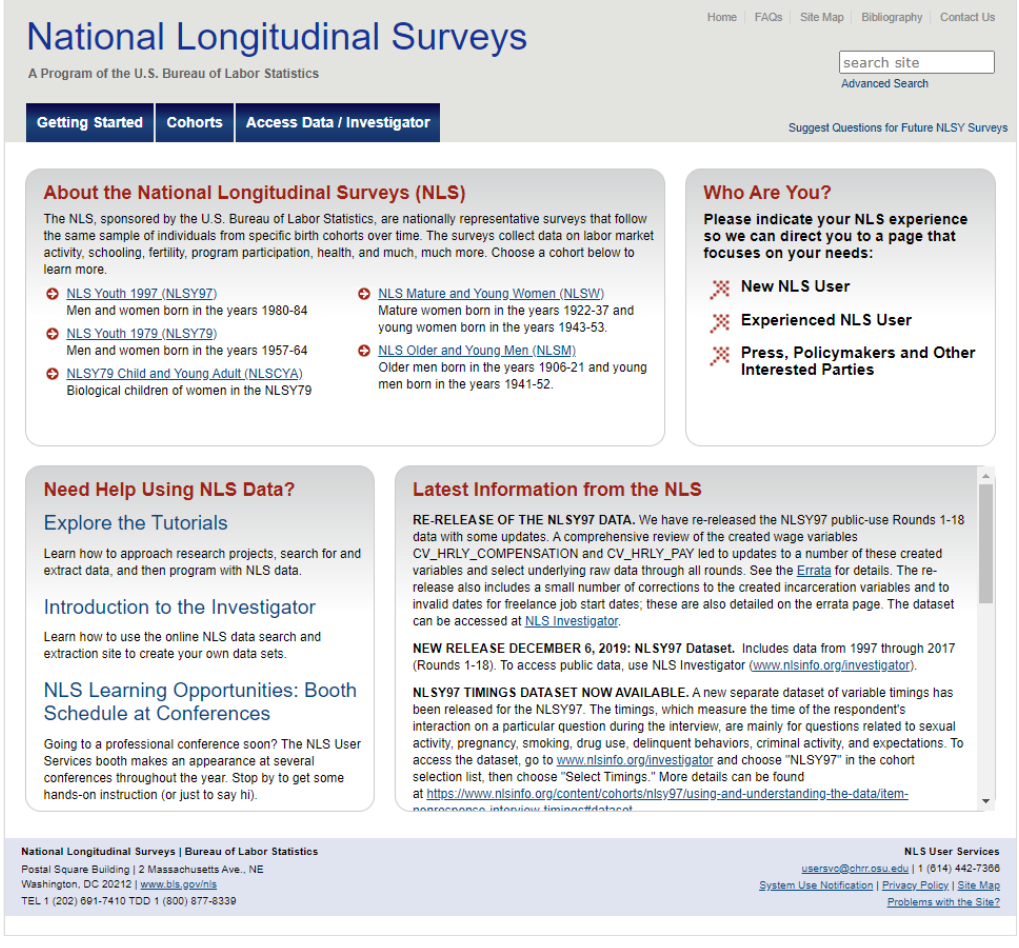
NLSY Dataset

The dataset used in this session is a subsample of the National Longitudinal Survey of Youth (NLSY).

More data and explanations here.



Describing Data

To get a **general description** of the dataset in memory and the format of each variable, type `describe`.

```
Contains data from data1.dta
  obs:           540                          Random subsample of data from NLSY79
 vars:            26                          30 Aug 2017 19:21
-------------------------------------------------------------------------------
              storage   display    value
variable name   type    format     label      variable label
-------------------------------------------------------------------------------
id              int     %8.0g                 respondent's identifier
female          byte    %8.0g
date_birth      int     %d
ethnicity       str8    %9s
ethhisp         byte    %8.0g                 hispanic
ethblack        byte    %8.0g      yn         black
ethwhite        byte    %8.0g                 white
age             byte    %8.0g                 age in 2002
height          byte    %8.0g                 height in 1985 (in inches)
weight85        int     %8.0g                 weight in 1985 (in pounds)
weight02        int     %8.0g                 weight in 2002 (in pounds)
sm              byte    %8.0g                 year of schooling of respondent's mother
sf              byte    %8.0g                 year of schooling of respondent's father
pov78           byte    %8.0g      yn         living in poverty in 1978
s               byte    %8.0g                 years of schooling (as of 2002)
asvab_mean      float   %9.0g                 aptitude test, composite score
asvab02         byte    %8.0g                 arithmetic reasoning
asvab03         byte    %8.0g                 word knowledge
asvab04         byte    %8.0g                 paragraph comprehension
earnings        double  %9.0g                 hourly earnings in 2002 (in $)
hours           byte    %8.0g                 number of hours worked per week in 2002
```

Note that `describe using filename` describes a stored Stata format dataset. You can also **describe a subset of a dataset** by specifying the variables you are interested in: `describe varlist`.

Variables

Names: variable names can be 1-32 characters long and can be formed only by letters, numbers, and underscore.

Types: there are two types of variables in Stata, *numeric* and *string*. A third type, *date*, is a special type of numeric. Numeric variables contain numbers. String variables contain text which can contain any character on the keyboard (letters, numbers, and special characters). Numeric calculations and statistical analysis can be done on numeric variables but not on string variables.

Numeric: there are five numeric types for storing variables, three of them are integer types (*byte*, *int*, *long*), and two of them floating point (*double* and *float*). For further info, type `help data types`.

Variables

Stata has a **color-coded system** for each type:

- **Black** is for numbers.
- **Red** is for text or strings.
- **Blue** is for labeled variables (a short description is inputed to each value).

Missing values are represend by a dot (“.”).

When **string variables have missing values**, these are blank, and are represented in commands by two double quotes with nothing in between (“”).

female	date_birth	ethnicity	ethhisp	ethblack
0	05sep1961	white	0	no
0	20mar1958	white	0	no
1	17mar1962	white	0	no
0	19oct1959	white	0	no
1	21jul1958	white	0	no
0	04sep1964	white	0	no
0	19jun1959	black	0	yes
0	02may1963	black	0	yes

Summary Statistics

To calculate **summary statistics**, such as means, standard deviations, and so on, use the command `summarize`.

You can also use `summarize, detail`. This will also report percentiles, the variance, measures of skewness and kurtosis.

age in 2002

	Percentiles	Smallest		
1%	37	37		
5%	37	37		
10%	38	37	Obs	540
25%	39	37	Sum of Wgt.	540
50%	40		Mean	40.68519
		Largest	Std. Dev.	2.2317
75%	42	45		
90%	44	45	Variance	4.980485
95%	44	45	Skewness	.1884904
99%	45	45	Kurtosis	2.003487

To calculate **correlation** or **covariance** matrices, use the command `correlate`.

Frequencies

Use the command `tabulate varname` to get the absolute frequency (*Freq.*), the relative frequency for each value (*Percent*) and the cumulative frequency (*Cum.*).

`table varname, contents()` allows you to choose the contents of the table. You can select up to five statistics (e.g. `table female, c(freq mean age mean s)`). If table cell contents are not specified, Stata provides a raw count of each value by typing `table varname`.

Using `bysort` as a prefix, you can also generete threeway crosstabs. Try: `bysort female: tab ethblack ethwhite, column row`.

For continuous data, try `tabstat`. For instance, `tabstat age s, statistics(mean median sd var count range min max)`.

Questions

1. Is respondents' education positively correlated with their parents' education?

2. Compute average test scores by ethnicity and gender.

3. Are respondents who were living in poverty in 1978 more likely to earn less in 2002?

Data Manipulation

Sorting: if you have to sort your data observations (rows), type `sort varname`. This puts the observations in ascending order. To put them in descending order, use `gsort -varname`.

Ordering: you can re-order the variables (columns) by typing `order varlist`, writing the variables in `varlist` in the desired order.

Renaming: to change the name of a variable, type `rename varnameold varnamenew`.

Labeling: add labels to the values. For example, `label define sex 0 "male" 1 "female"`, and then `label values female sex`, or a short description of the variable, such as `label variable sex "Sex (0 if male, 1 if female)"`. If you type `labelbook`, Stata will list all the labels in the data.

Table 1: Operators in Stata

Operator	Meaning	Operator	Meaning
==	equal to	&	and
>	greater than	|	or
=>	at least as big as	~	is not
<=	at most as large as	!=	not equal to
<	less than	~=	not equal to

Drop and keep: it works with both subsets of observations and variables.

Data Manipulation

Generating new variables: `generate` vs. `egen`

- `generate` create unique values for each observation (e.g. `gen LS = log(s)`).
- `egen` can create summary statistics (e.g. `egen MEDS = median(s)`).

Other examples:

```
gen s2 = s^2
gen x = 1
gen name = "A"
gen surname = "B"
gen fullname = name+" "+surname
gen abb = "Mr." if female==0
gen id = _n
```

Questions

1. Are male respondents more likely to work full-time (i.e. 40 hours or more)?

2. In the data, non-white respondents have lower earnings on average. Find evidence suggesting that less favorable socioeconomic conditions when they were children may be one of the reasons.

3. Explore the relationship between change in weight (from 1985 to 2002) and wages earned in 2002. Is there any difference by gender?