How to Graph Point Estimates and 95% Confidence Intervals Using Stata 11 or Excel

The methods presented here are just several of many ways to construct the graph.

A. Simplest method using Stata:

One simple way in which to portray a graphical representation of the confidence intervals for the difference in mean weight change for each of the age-gender groups is to use the Stata command **serrbar**, with the **option scale(1.96)** to provide bars extending to +/- 1.96 standard errors.

1) First, create a new small data set in the editor by manually entering the following variables:

agegen (age-gender group), mean(the mean weight change within an age-gender group), and se (the associated standard error of the mean weight change).

Enter the following values into the Stata data editor:

```
. list

     agegen       mean         se
  1.      1     16.125   3.505799
  2.      2   22.88889   3.316515
  3.      3   6.948718   2.211474
  4.      4   14.02941   5.124386
```

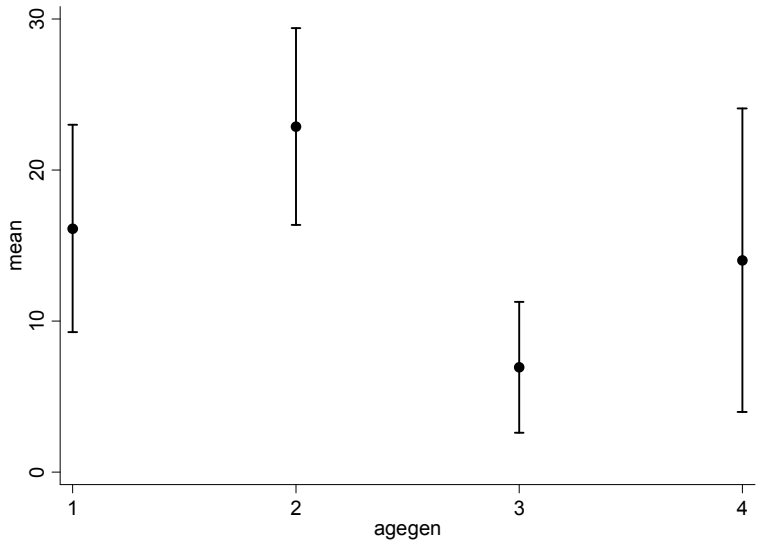
Update: Before step 2, run the following command to turn strings into numbers:
. destring, replace

2) Label the agegen variable:

```
. label define agegen 1 "M < 30" 2 "M 30+" 3 "F < 30" 4 "F 30+"

. label values agegen agegen

. list

     agegen       mean         se
  1.  M < 30     16.125   3.505799
  2.   M 30+   22.88889   3.316515
  3.  F < 30   6.948718   2.211474
  4.   F 30+   14.02941   5.124386
```

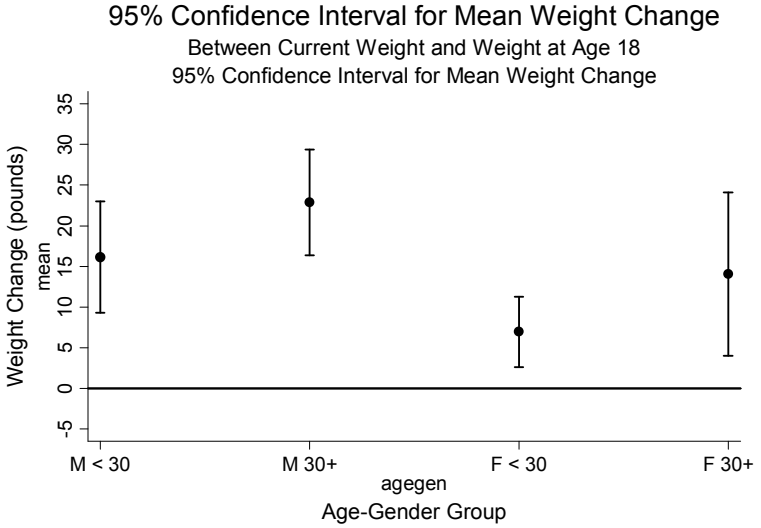

3) Graph using the serrbar command:

```
. serrbar mean se agegen, scale (1.96)
```



4) Enhance the serrbar command with some options:

```
serrbar mean se agegen, scale (1.96) title("95% Confidence Interval for Mean
Weight Change")  sub("Between Current Weight and Weight at Age 18") yline(0)
yline(0) b2(Age-Gender Group) t1(95% Confidence Interval for Mean Weight Change)
l1(Weight Change (pounds))  ylab(-5(5)35) xlab(1(1)4) xlabel(, valuelabel)
```



B. Method 2 using Stata:

1) Enter the data as follows, with a separate line for the lower limit of the CI, the mean, and the upper limit of the CI:

group	level	change
1	Lower	8.65
1	Mean	16.13
1	Upper	23.60
2	Lower	15.89
2	Mean	22.89
2	Upper	29.89
3	Lower	2.47
3	Mean	6.95
3	Upper	11.43
4	Lower	3.60
4	Mean	14.03
4	Upper	24.46

2) Label the age-gender group variable.

```
label define agegenf 1 "M < 30" 2 "M 30+" 3 "F < 30" 4 "F 30+"
label values group agegenf
```

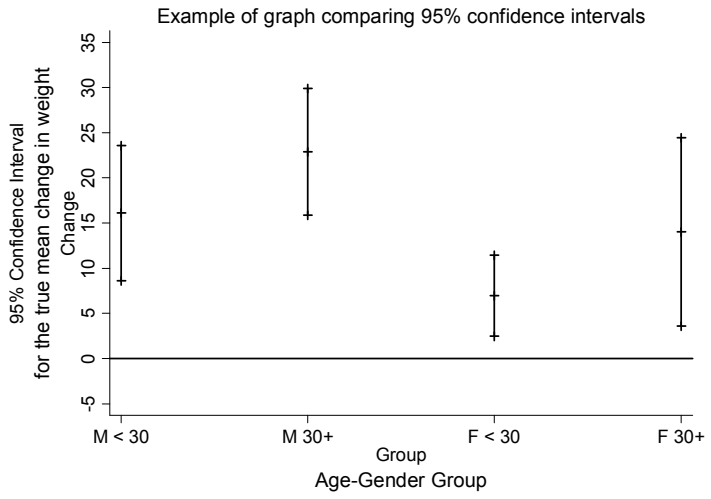
3) Sort the data.

```
egen xmin=min(group), by(group)
egen xmax=max(group), by(group)
gsort -xmin -xmax group group
```

4) Plot using the "twoway scatter" command.

```
twoway scatter change group, msymbol(+) c(L) xlab(1(1)4) ylab(-5(5)35) l2("95%
Confidence Interval") l1("for the true mean change in weight") b2(Age-Gender
Group) t1(Example of graph comparing 95% confidence intervals) yline(0) xlabel(,
valuelabel)
```

5) The above commands yield the following plot:



C. A method using Excel:

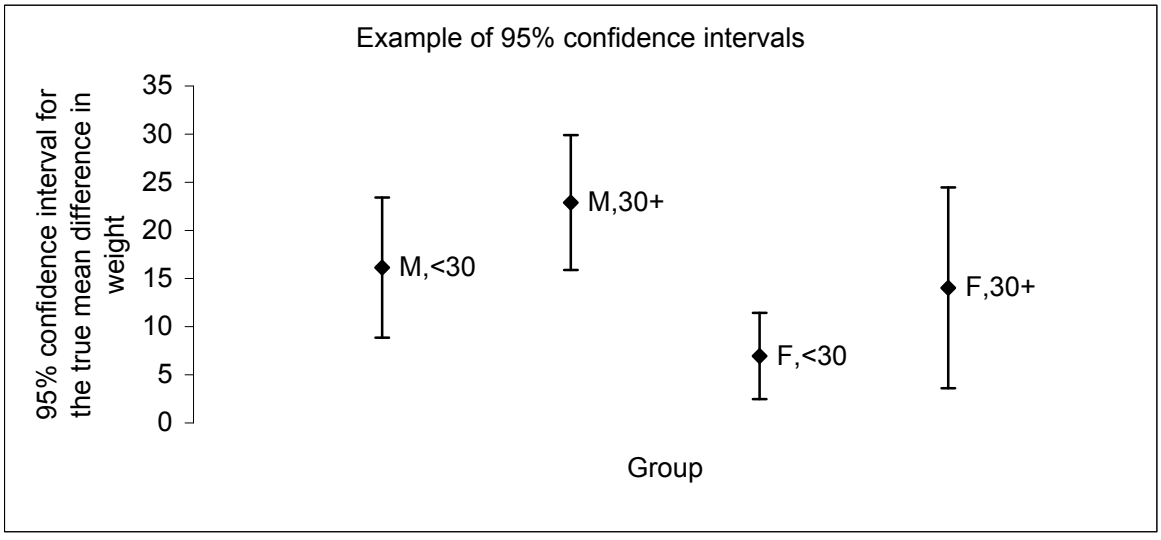
<u>Step 1</u>: Enter the data into a new spreadsheet. You will need to enter the group variable, the mean and the error bound (this is the critical value (t or z) times the standard error, aka the difference from the mean to the confidence limits). For our example, enter the data as illustrated below:

Group	Mean	ErrorBound
1	16.13	7.28
2	22.89	7
3	6.95	4.48
4	14.03	10.43

<u>Step 2</u>: Follow the steps below using the "Chart Wizard" to construct the graph.

a) Using the mouse, select the Group and Mean values.
b) Click on the "Chart Wizard".
c) Select "XY (Scatter)", click "Next".
d) Select: Series in Columns, click "Next".
e) Remove Gridlines, add axis labels as you want, click "Next".
f) Select how you want to store the graph, click "Finish".
g) Go into the graph and double-click on one of the data points.
h) A menu will appear titled "Format Data Series".
i) Select "Y Error Bars" menu.
j) In "Display", select "Both".
k) In "Error Amount", select "Custom".
l) You want to add and subtract the error bounds that you entered into the spreadsheet, so for each "+" and "-", select the error bounds from your spreadsheet by click and dragging over these values.
m) Then select "Okay".

The graph you obtain looks something like this:



You may want to change the labels for the groups or axis labels or title.

