


This is a second set of extra assignments (1-8) related to inferential statistics in *Basic SPSS Tutorial*. All computer related operations are placed in a blue-shaded box with the  symbol. References to Basic SPSS Tutorial are indicated with BST.

In Basic SPSS Tutorial we describe how to test the mean difference between two independent groups. For instance one could test whether mean income differs between native people and ethnic minorities, or whether Aboriginals have on average a lower life expectancy than whites. There is also the notorious ‘gender-gap’: women on average still lag behind when it comes to all kinds of social and economic indicators. The questions below address one aspect of this gender gap. In a study all respondents answered to statements related to child raising attitudes. One of the statements (or items) is: ‘Women are more suited to raise children than men. Respondents answered with ‘agree strongly’ (code 1), ‘agree’ (2), ‘neither agree nor disagree’ (3), disagree (4) and strongly disagree (5). From relevant theory one can infer the hypothesis that woman on average will disagree more often than men.

To test this hypothesis we use a random sample from the Dutch population in 1995. The item about whether women are more suited to raise children is called *Womenraise* and we assume that it is an interval scaled variable. In terms of means or averages we expect that the mean on *Womenraise* will be higher among the group of women (they disagree more often) compared to the group of men.



Download the data set GENDERGAP.SAV from the web page: <http://study.sagepub.com/basicspss>. Start SPSS and open GENDERGAP.SAV (BST: section 2.2).

Open also a text file in the program Word or any other word processor where you store your answers to the questions below.

1. What is the mean and variance for the variable *womenraise* exactly for women and what is it for men (Tip you may use a frequency table and check the mean and the variance (see BST: section 4.2) after you split the data (BST: section 3.5))
2. What is the difference in mean between men and women and more importantly is it in the right (expected) direction? Please explain.
3. In BST, section 5.5.1, we described that both groups may have quite different variances (the squared standard deviations), this is called *heteroscedasticity*. How large exactly is the difference in variances of the variable *Womenraise* between women and men in the sample?

Of course one cannot conclude that your answers to questions #1 - #3 are true for the population of women and men in the Netherlands. After all, we drew only a sample and samples may be off the mark.



Test whether the variances for the variable *Womanraise* differs between men and woman. (In SPSS this test is part of the independent samples t-test and is called 'Levene's Test for Equality of Variances', see BST: section 5.5.1.

4. What do you conclude from the 'equality of variances' test (using $\alpha = 0.05$): is it reasonable to assume equal variances or not? Please explain.
5. Suppose we assume equal variances (In SPSS you have to look in the row that says 'equal variances assumed'). What is the t-value and is the accompanying probability significant or not (use $\alpha = .10$)?
6. How large is the t-value if we assume unequal variances? Does this change you conclusions about the research hypothesis? Please explain.

In BST, section 5.3 we discussed the test for a proportion. Below we will test whether the proportion of Democrats in the Netherlands is likely to exceed .18 (or 18%) or not.

7. What is the proportion of democrats in the sample (create a frequency table for the variable *Democrats*, or alternatively, compute the mean for the variable *Democrats*). Note: if a variable is coded 0/1 we call it a *dichotomous* variable. The mean of such variables is equal to the proportion of people with code 1.



Use SPSS to test whether the proportion of democrats in the population is .18 or lower. Take 5% (.05) as the level of significance.

8. What is to conclude, do we have to reject our null hypothesis? Please explain.

