

## SPSS PC Version 10: Creating and Reporting Z-Scores<sup>1</sup>

The following uses a set of variables from the "1995 National Survey of Family Growth" to demonstrate how to use some procedures available in SPSS PC Version 10.

A standard Z-score tells us how many standard deviations above or below the mean a single case in a distribution is located. So the key to calculating a standard Z-score is finding the mean and the standard deviation of the distribution. SPSS' "Descriptives" procedure will give this information, and, will also perform the next step by using the mean and standard deviation to calculate a standard Z-score for every case in the distribution. Here is an example using the variable *educ* ("Education in years") in the NSFG dataset we've been using.

- To get the descriptive statistics for the variable *educ* go to the **Analyze** menu in SPSS, choose **Descriptive Statistics**, and then **Descriptives....** In the dialog box that appears choose *educ* and put it in the list of variables that you want descriptive statistics for.
- Before you hit "OK," click on the box in the lower left corner next to the statement "Save standardized values as a variable." This option asks SPSS to use the mean and standard deviation it calculates to create standard Z-scores for each of the cases in the sample. Now hit "OK" to get the following results:

	N	Minimum	Maximum	Mean	Std. Deviation
EDUC Education in Years	10847	.00	19.00	12.6809	2.7715
Valid N (listwise)	10847				

The syntax for this is:

```
DESCRIPTIVES  
  VARIABLES=educ /SAVE  
  /STATISTICS=MEAN STDDEV MIN MAX .
```

- You will notice that your output contains descriptive statistics for the variable *educ*, including the number of valid cases, the minimum observed value, the maximum observed value and, most importantly, the mean and standard deviation. On average, the respondents in the sample have about 12.68 years of education with a standard deviation of 12.68 years.
- The output does not contain anything about the standard Z-scores you requested. Rest assured, they are now in the data set, saved as a new variable called *zeduc*. Again, this variable indicates, for each person, the number of standard deviations above or below the mean level of education their own education falls. We can ask SPSS to print out the standard Z-scores for a selected number of cases in the data set using the "Case Summaries" procedure. Go to the **Analyze** menu in SPSS, choose **Reports**, and then **Case Summaries....** In the dialog box that appears, select the variables you want reported and place them in the top box titled "Variable(s)." Here you should choose the original variable, *educ*, and the standardized version of that variable, *zeduc* (this one should appear at the bottom of your variable list). By default, SPSS will report the values on these variables for the first 100 cases. For this example we want values for only 5 cases, so next to the box that says "Limit cases to first" we can change the "100" to a "5." Hit "OK" . The syntax that would create the same result is:

```
SUMMARIZE  
  /TABLES=educ zeduc  
  /FORMAT=VALIDLIST NOCASENUM TOTAL LIMIT=5  
  /TITLE='Case Summaries'  
  /MISSING=VARIABLE  
  /CELLS=COUNT .
```

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- Notice that the first person in the sample has 14 years of education, above the average of 12.68 reported above. Sure enough, the standard Z-score for this case indicates that this is .48 standard deviations above the mean. Assuming that this distribution is roughly normal, I could use this Z-score to find the probability of randomly selecting a person with more than 14 years of education. Using Table A of Appendix C in the textbook I find that about 31.56% of the cases in a normal distribution fall beyond a Z-score of .48, so the probability of randomly selecting someone with more than 14 years of education is about .3156.

**Case Summaries<sup>a</sup>**

	EDUC Education in Years	ZEDUC Zscore: Education in Years
1	14.00	.47594
2	12.00	-.24569
3	14.00	.47594
4	12.00	-.24569
5	11.00	-.60650
Total	N 5	5

a. Limited to first 5 cases.