**ABORTION1A: Exercise Using SPSS to Explore Measurement and Reliability**

Author:   Ed Nelson
Department of Sociology M/S SS97
California State University, Fresno
Fresno, CA 93740
Email:  **ednelson@csufresno.edu**

**Note to the Instructor:** The data set used in this exercise is gss14\_subset\_for\_classes\_ABORTION.sav which is a subset of the 2014 General Social Survey. Some of the variables in the GSS have been recoded to make them easier to use and some new variables have been created.  The data have been weighted according to the instructions from the National Opinion Research Center.  This exercise uses COMPUTE in SPSS to create new variables and FREQUENCIES to see how respondents answered the abortion questions.  Cronbach’s Alpha is used to estimate the internal consistency of the composite measure that we’re going to create. There is an excellent YouTube video in two parts on Cronbach’s Alpha — ([**Part 1**](https://www.youtube.com/watch?v=2gHvHm2SE5s) and [**Part 2**](https://www.youtube.com/watch?v=9rS49o1rdnk)). A good reference on using SPSS is *SPSS for Windows Version 23.0 A Basic Tutorial* by Linda Fiddler, John Korey, Edward Nelson (Editor), and Elizabeth Nelson.  The online version of the book is on the [**Social Science Research and Instructional Center's Website**](http://ssric.org/node/582).  You have permission to use this exercise and to revise it to fit your needs.  Please send a copy of any revision to the author. Included with this exercise (as separate files) are more detailed notes to the instructors, the SPSS syntax necessary to carry out the exercise (SPSS syntax file), and the SPSS output for the exercise (SPSS output file).  Please contact the author for additional information.

I’m attaching the following files.

* [**Data subset**](http://ssric.org/files/gss14_subset_for_classes_ABORTION.sav) (.sav format).
* [**Extended notes for instructors**](http://ssric.org/files/Extended_Notes_for_Instructors_for_ABORTION1A.docx) (MS Word;.docx format).
* [**SPSS syntax file**](http://ssric.org/files/SPSS_Syntax_for_ABORTION1A.sps) (.sps format).
* [**SPSS output file**](http://ssric.org/files/SPSS_Output_for_ABORTION1A.spv) (.spv format).
* [**This page**](http://ssric.org/files/ABORTION1A.docx) (MS Word;.docx format).

 **Goals of Exercise**

The goal of this exercise is to create a measure of how respondents feel about abortion (i.e., whether they think abortion should be legal or not).  In another exercise we will focus on the relationship between attitudes toward abortion, religion, and politics.  However, the focus of this exercise will be on creating the abortion measure.  The exercise also gives you practice in using several SPSS commands – COMPUTE to create new variables and FREQUENCIES to explore how respondents answered the abortion questions.  You will also be using Cronbach’s Alpha to estimate the internal consistency or reliability of the variables that make up the abortion measure.

**Part I—Questions Used to Measure Attitudes towards Abortion**

We’re going to use the General Social Survey (GSS) for this exercise.  The GSS is a national probability sample of adults in the United States conducted by the National Opinion Research Center.  The GSS started in 1972 and has been an annual or biannual survey ever since.  For this exercise we’re going to use a subset of the 2014 GSS. Your instructor will tell you how to access this data set which is called gss14\_subset\_for\_classes\_ABORTION.sav.

The GSS has a series of seven variables that we can use to measure how respondents feel about abortion.  All seven questions start with “please tell me whether or not you think it should be possible for a pregnant woman to obtain a legal abortion if …” There are seven scenarios presented.  The variable name in the data set is in parentheses.

* “If the woman wants it for any reason?” (a1\_abany)
* “If there is a strong chance of serious defect in the baby?” (a2\_abdefect)
* “If the woman's own health is seriously endangered by the pregnancy?” (a3\_abhlth)
* “If she is married and does not want any more children?” (a4\_abnomore)
* “If the family has a very low income and cannot afford any more children?” (a5\_abpoor)
* “If she is not married and does not want to marry the man?” (a6\_absingle)
* “If she became pregnant as a result of rape?” (a7\_abrape)

Let’s start by running FREQUENCIES in SPSS for each of these seven variables.  (See Chapter 4, Frequencies in the online SPSS book cited on page 1 of this exercise.)   Write several paragraphs describing how respondents in 2014 answered these questions.  Are respondents more likely to think that abortion ought to be legal in some of the scenarios than in others?  Consider carefully how you are going to present the data to illustrate the patterns you see.

**Part II—Internal Consistency or Reliability of the Variables**

We don’t want to deal with each of these seven variables separately.  Rather we want to develop a composite measure that combines these variables.  We need to determine if these seven variables are internally consistent.  This is basically a question of reliability.  Are they consistent in the sense that a person who thinks that abortion should be legal in one of these scenarios is more likely to think that abortion should be legal in the other scenarios as well?

A commonly used measure of internal consistency is Cronbach’s Alpha.  This statistic varies from 0 to 1.  Low values indicate low consistency and high values indicate high consistency.  Alpha increases as the number of items increases and as the correlation between items increases.  One rule of thumb that is often used is that an Alpha of .70 or higher is necessary to indicate reliability although some feel that a higher value is required.

Let’s have SPSS compute Cronbach’s Alpha for the seven questions about abortion.  Remember that the variable names are a1\_abany, a2\_abdefect, a3\_abhlth, a4\_abnomore, a5\_abpoor, a6\_absingle, and a7\_abrape.  Open the data set in SPSS and click on “Analyze” in the menu.  Then point your mouse at “Scale” and click on “Reliability Analysis”.  Click on each of the seven variables in the box on the left and move them over to the “Item” box on the right until you have selected all seven variables.  Click on the “Statistics” button in the upper right.  This will open the Statistics box. Then click on “Scale if item deleted” in the upper left and “Correlations” in the upper right.  Click on “Continue” and this will take you back to the original box where you selected the variables.  Finally click on “OK” and SPSS will carry out the calculations you requested.  There is an excellent YouTube video in two parts on Cronbach’s Alpha — ([**Part 1**](https://www.youtube.com/watch?v=2gHvHm2SE5s) and [**Part 2**](https://www.youtube.com/watch?v=9rS49o1rdnk)). My instructions only ask for some of the calculations suggested in this video.

In your output there are three important pieces of information:

* the value of Cronbach’s Alpha,
* the inter-item correlation matrix showing the correlations between each pair of variables, and
* the value of Cronbach’s Alpha if an item (i.e., variable) is deleted.

You want to get a Cronbach’s Alpha of .70 or higher.  The correlations between variables should be consistently high.  Generally the higher the inter-item correlations, the higher the value of Alpha.  It’s also helpful to look at the effect of deleting a variable on Alpha. This will tell you if you ought to consider deleting that variable.

Follow these instructions to compute Alpha for the seven abortion variables.  Based on your analysis, do you think the composite measure is internally consistent or reliable?  Explain why.

**Part III—Constructing the Composite Variable**

Construct the composite variable using COMPUTE in SPSS to create it.  (See Chapter 3, Creating New Variables Using Compute in the online SPSS book.)  If any cases have missing information for any of the seven variables, the composite measure will automatically be given a system missing value.  Call your new variable ABORTION.

It’s easy to make a mistake so I have created a variable that shows you what the frequency distribution for your variable ought to look like.  The variable I created is named ABORTIONR.  Notice the R at the end of the variable name.  That distinguishes your variable from my variable.  Run FREQUENCIES for your variable (ABORTION) and the variable I created (ABORTIONR).  Your variable and my variable ought to have identical frequency distributions.  If they don’t, you made a mistake and you’ll need to redo your work in SPSS.

Think of the composite variable as a continuum from high support for the legality of abortion to low support.  Each of the seven variables that makes up the composite measure has two values – 1 for those who think abortion should be legal and 2 for those who think it should not be legal.  When you sum the seven variables you end up with a new variable that ranges from seven (i.e., those who think that abortion should always be legal) to fourteen (i.e., those who think that abortion should never be legal).  One way to interpret the composite variable is to compare the highest level of support (i.e., those who score seven) to the lowest level of support (i.e., those who score fourteen).  Another way would be to combine seven and eight and compare that to those who scored thirteen or fourteen.  Write a paragraph comparing support for the legality of abortion with opposition using both of the methods described above.

**Coming Attractions**

In other exercises we’re going to use the abortion measure you created (ABORTION) to discover whether attitudes toward abortion is related to religion and politics.