UNIVARIATE ANALYSIS

Chapter 6 **Creating Composite Measures**

Now that you've had a chance to get familiar with univariate analysis, we're going to add a little more sophistication to that process. As you're about to see, it is not necessary to limit your analysis to single measures of a variable. In this chapter, we're going to create **composite measures** made up of **multiple indicators** of a single concept.

Why would a criminal justice researcher want to do that? Many of the key concepts in criminal justice are complex and can't be indicated simply by the responses to a single variable or by a single piece of information. To take a very important example, how do we define crime among the most important concepts in criminal justice? If we were trying to measure how much crime takes place in a state, it would not be enough just to look at any one type of serious crime. The Uniform Crime Reporting Program uses seven crime categories to establish a "crime index" to measure the trend and distribution of crime in the United States: murder and nonnegligent manslaughter, forcible rape, robbery, aggravated assault, burglary, larceny and theft, and motor vehicle theft; the total crime index is the sum of these offenses.

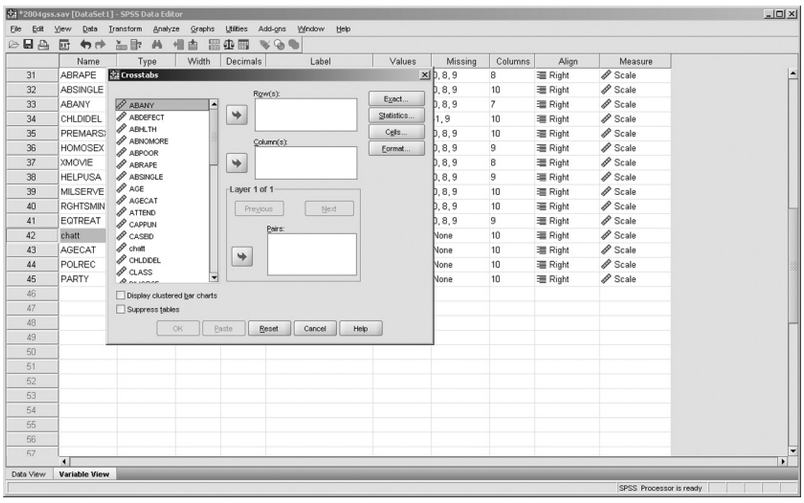
Take another example: You can explore the kinds of harm binge drinking has on nonbingeing students, also known as secondhand binge effects. Suppose that you want to determine how many residential students experience any of these effects or you want to find out how many of the effects (ranging from none to all eight) any of the students on a campus experienced.

In this chapter, we will explore how SPSS can help you create composite measures such as a crime index or an index of secondhand binge effects. For purposes of this discussion, let's look at attitudes toward abortion. Seven GSS items reflect people's attitudes. You can ask SPSS to generate frequency tables for all seven abortion variables from the "2004GSS.SAV" data set. (This exercise is also presented on the Web site.) These tables on abortion suggest that attitudes toward abortion fall into three basic groups. A small minority of no more than 11% are opposed to abortion under any circumstance. We conclude this because 89% would support abortion if the woman's life was seriously endangered. Another group, a little under half of the sample population (48%), would support a woman's free choice of abortion for any reason. The remainder of the sample population would support abortion in only a few circumstances involving medical danger or rape.

6.1 Using Crosstabs

To explore attitudes toward abortion in more depth, we need to use a new SPSS command: "Crosstabs." This command provides us with a cross-classification or **crosstabulation** of people in terms of their answers to more than one question. The resulting table is sometimes called a **crosstab** or a **contingency table**, the latter term indicating that the values of one variable are examined for how contingent they are on the values of another variable. Later in this book, we'll explain how to use crosstabs to test hypotheses about two or more variables when each of the variables is measured on the nominal or ordinal scale. Here we'll use it to help us understand how to combine variables into a composite measure. Let's try a simple example.

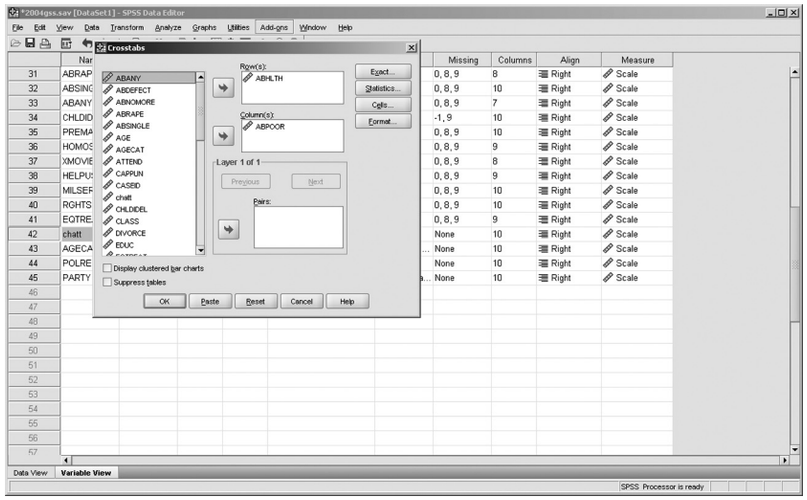
The command pathway to this technique is "Analyze → Descriptive Statistics → Crosstabs." Work your way through those menu selections, and you should reach a window that looks like the following.



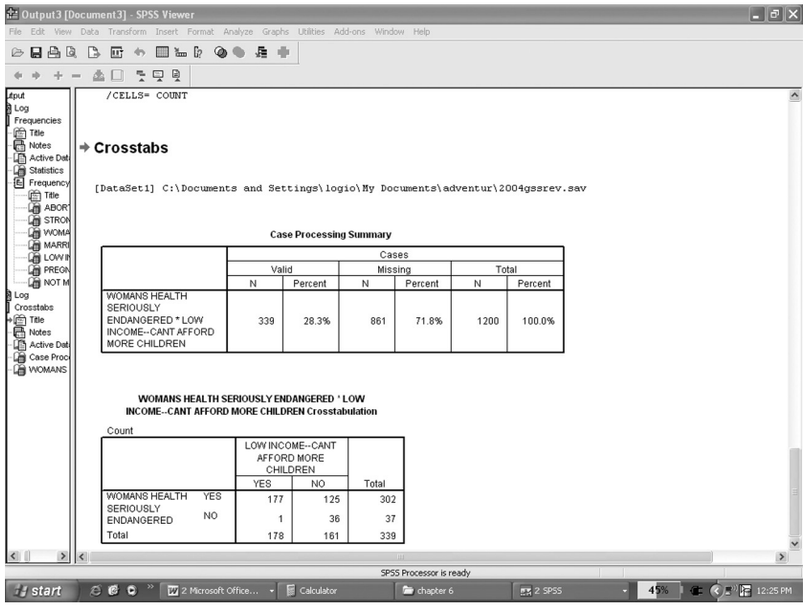
Because the logic of a crosstab will be clearer when we have an example to look at, we ask that you follow these steps on faith, and we'll explain it all in a moment.

Let's analyze the relationship between the answers people gave to the question about whether a woman should be able to have an abortion if her health was seriously endangered (ABHLTH) and if she was too poor to have more children.

In the "Crosstabs" window, click ABHLTH and then click the arrow pointing toward the "Row(s)" field. Then click on ABPOOR and transfer it to the "Column(s)" field, producing the result shown next.



Once your window looks like this, click "OK." After a few seconds, you will be rewarded with the following data in your "Output" window.



Notice that the table demonstrates the logic of the command we asked you to make. By specifying ABPOOR as the column variable, we have caused it to appear across the top of the table with its attributes, "Yes" and "No," representing the two columns of figures. ABHLTH, as the row variable, appears to the left of the table, and its attributes constitute the rows of the table.

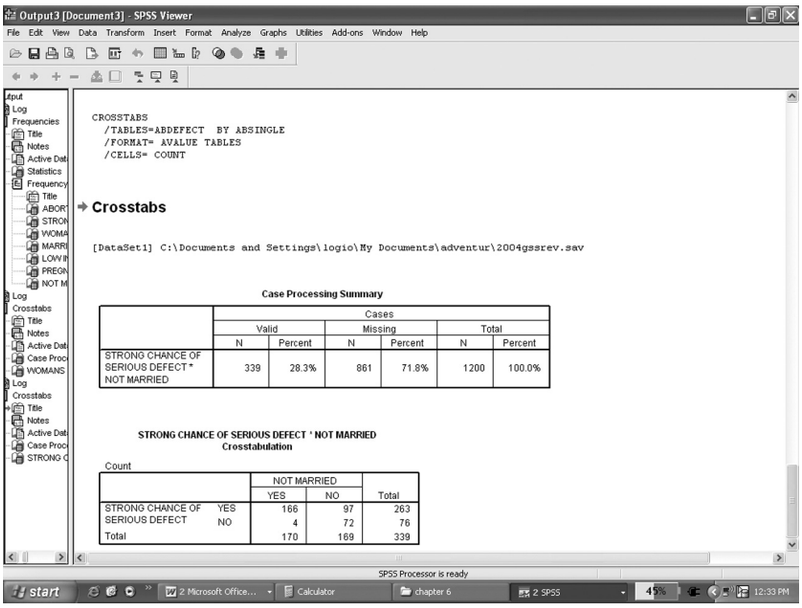
More important, this table illustrates a logic that operates within the system of attitudes people hold about abortion. First, we notice that 177 people say they would support a woman's decision to choose abortion if her health was seriously endangered *and* say they would support a woman's choice of abortion if she was poor and felt she couldn't afford more children. At the opposite corner of the table, we find 36 people who would oppose abortion in both cases.

The table shows that 125 respondents said they would support the right to choose if the woman's health was seriously endangered but not on the basis of poverty. Notice that only one respondent would support abortion on the basis of poverty but deny it on the basis of threats to health. There are probably two elements involved in this pattern. Threats to the woman's life probably are seen as more serious than the suffering presented by another mouth to feed in a poor family. At the same time, few if any would blame a woman for ending a pregnancy that seriously threatened her health. However, some people blame the poor for their poverty and probably would say that the woman in question should have avoided getting pregnant because she knew that it would be hard for her to feed another child. As a consequence, then, 125 of the respondents oppose abortion under some circumstances but are willing to make an exception in the case of a threat to the woman's health.

What are we to make of the one person who said he or she would approve an abortion for the poor but not for the woman whose life was threatened? Without ruling out the possibility of some complex point of view that demands such answers, it is most likely that this respondent misunderstood one or both of the questions. Fortunately, one is such a small number that this respondent will not seriously affect the analysis of this topic.

Additional information in the SPSS table will become more useful to us in later analyses. For example, the rightmost column in the table tells us that a total of 302 respondents with an opinion said they would approve an abortion for a woman whose health was seriously endangered, and 37 would not. The bottom row of numbers in the table gives the breakdown regarding the other variable.

Let's try another example. The threat of a birth defect was considered a more compelling reason for abortion by the respondents than the fact that the woman was not married. Run that table now. Use "Analyze → Descriptive Statistics → Crosstabs" to get to the "Crosstabs" window; specify ABDEFECT as the row variable and ABSINGLE as the column variable. Notice that you can click the "Reset" button to remove the variables already in the fields or individually move the variables back to the list and put in the new ones. Click "OK." Next, use the scroll bar to give a complete view of the table. Here's what the output should look like.



This table presents a strikingly similar picture. We see that 166 respondents support the woman's right to choose in both situations, and 72 oppose abortion in both instances. Of those who would approve abortion in only one of the two situations, almost all of them (97) make the exception for the threat of birth defects. Only 4 respondents would allow abortion for a single woman but deny it in the case of birth defects.

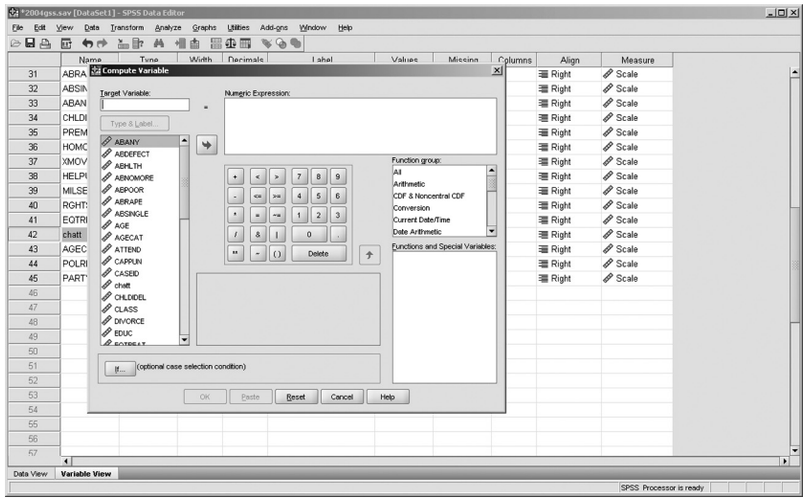
We could continue examining tables like these, but the conclusion remains the same: There are three major positions regarding abortion. One group approves it on the basis of the woman's choice, another group opposes it under all circumstances, and the rest approve abortion only in the case of medical complications or rape.

To explore attitudes toward abortion further, it will be useful for us to have a measure of attitudes that is not limited to a single item. In particular, it might be nice to have a single variable that captures the three groups we have been discussing. We're going to create two such composite measures in this chapter.

6.2 Combining Two Items in an Index

To begin, let's create a simple index based on the two variables we just examined. Our aim is to create a new measure—we'll call it ABORT—made up of three scores: 2 for those who approve of abortion if birth defects are likely and approve abortion for a single woman, 1 for those who approve of abortion in one circumstance (primarily birth defects) but not the other, and 0 for those who disapprove of abortion in both cases.

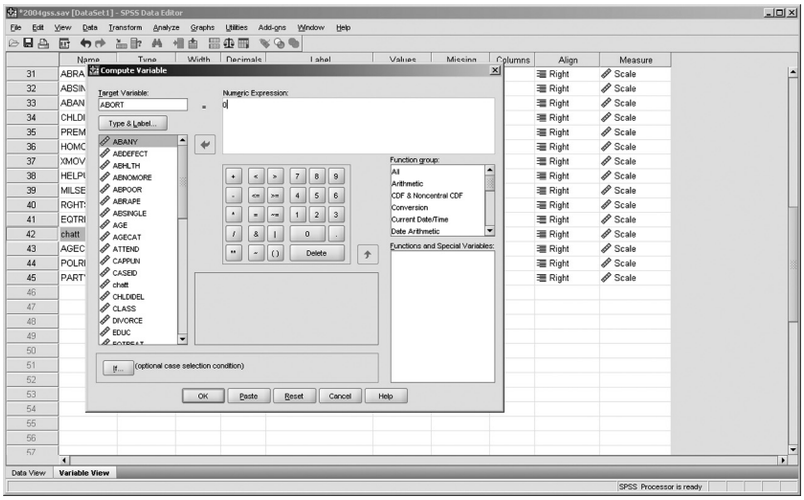
To do this, let's use the "Transform → Compute" command pathway. That will bring up the following window.



To initiate our index construction, we need to create the new variable so that SPSS will know where to put the results of our work. In the upper left corner of the "Compute Variable" window, click in the "Target Variable" field and type ABORT.

Notice that we've now begun a numeric expression that says "abort =," taking account of the equal sign already printed to the right of the "Target Variable" field. Our task from now on is to specify what ABORT equals by filling in the field titled "Numeric Expression." We'll do this in several steps.

Begin by entering 0 in that field. You can do this in one of two ways. You can simply type it in, or you can use the keypad in the center of the window. To use the latter, simply click the "0" key.



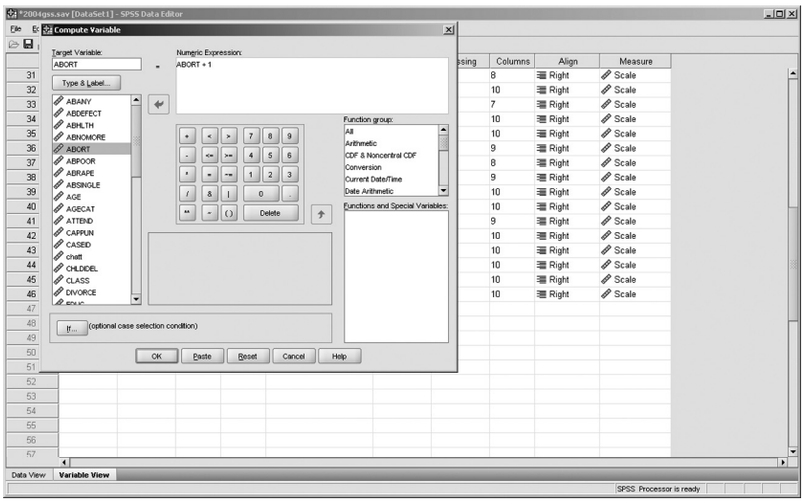
In either case, we've now instructed SPSS to create a new variable, named ABORT, and give everyone a score of 0 on it. Click the "OK" button at the bottom of the window to have SPSS execute the command.

Now let's start assigning index scores based on the answers people gave to the component items. First, if people agreed that a woman should be able to have an abortion in the case of a birth defect (scored 1 on ABDEFECT), we want to give them 1 point on our index. We do it as follows.

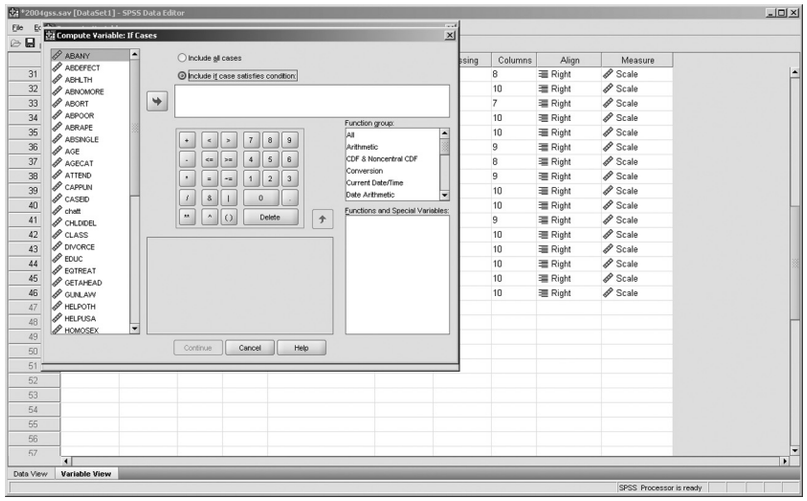
Select "Transform → Compute" again. You'll see that the "Compute Variable" window still has your previous work in it. Click "Reset" at the bottom of the window to clear the boards.

Next, type ABORT into the "Target Variable" field. (As an alternative, you could have left ABORT on the screen and simply erased the earlier instruction in the "Numeric Expression" field instead of clicking "Reset.")

In the list of variables, click ABORT and transfer it to the "Numeric Expression" field by clicking the arrow. Then click "+" and "1" in the keypad, so the whole instruction to SPSS is "ABORT = ABORT + 1" at this point.

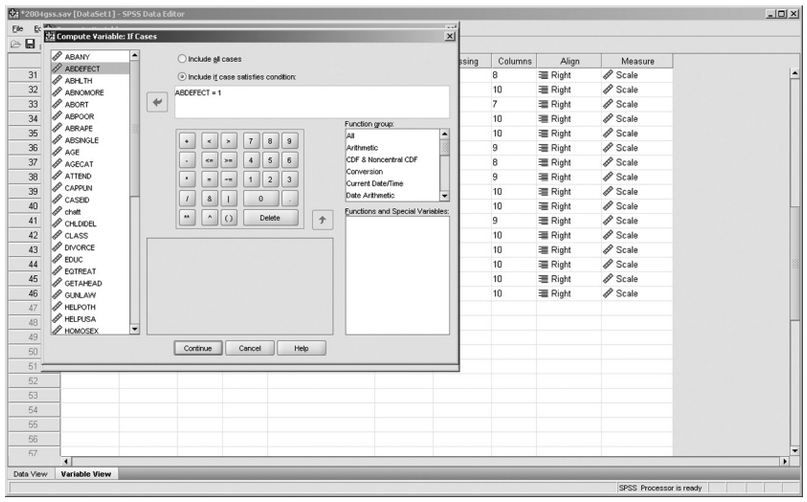


Now we want SPSS to take this step only for respondents who agreed that a woman should be able to have an abortion in the case of a birth defect. To make this specification, click the "If" button near the bottom of the window. Now you should be looking at the following window:



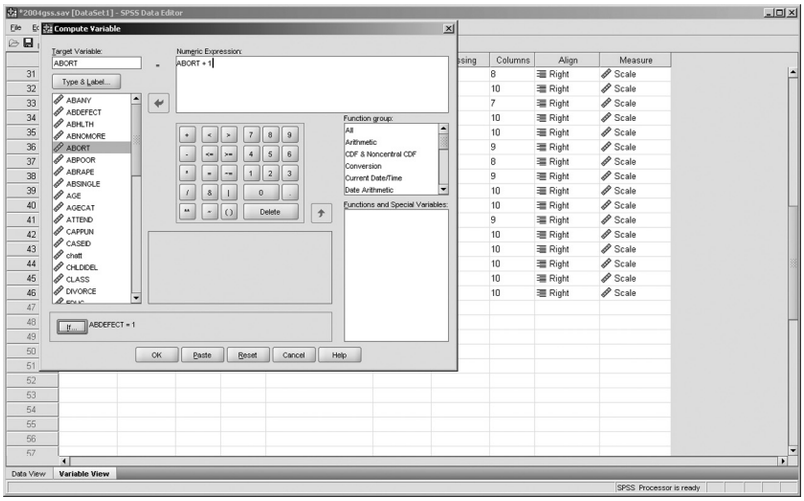
This new window will help us specify our instruction to SPSS. Begin by clicking the button "Include if case satisfies condition," which will engage the variable list.

Transfer ABDEFECT to the open field and then add "= l." using the keypad. Your screen should look like this:



We have now told SPSS that we want it to add a point to a person's ABORT index score only if the person's score on ABDEFECT is 1.

To continue, click the "Continue" button, and you will be returned to the "Compute Variable" window, where you will see the following:



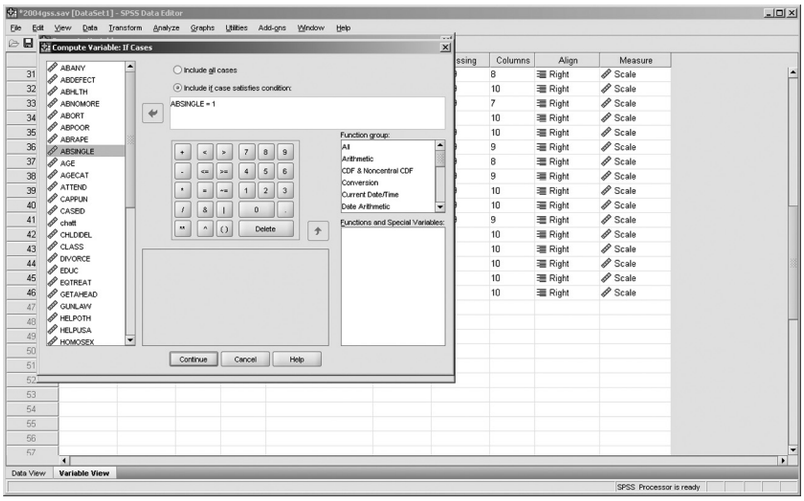
Take a minute to study the various elements of this window, and be sure you are clear on the logic of what we are asking SPSS to do. Once you are, click "OK." SPSS will ask, "Change the existing variable?" Say "OK."

Now you will be returned to your "Data" window, where you can watch the case counter at the bottom of the window indicate its progress through the data file, making the changes we've asked for. Eventually, you will see that the scores in the ABORT column now contain 0s and 1s.

Your next step is to repeat the same process using ABSINGLE in place of ABDEFECT. As you'll see, it's much easier the second time around. Select "Transform → Compute." Notice that "ABORT = ABORT + 1" is still active, as is the conditional statement near the bottom of the window.

Click "If."

All we need to do now is change the name of the variable we want SPSS to check from ABDEFECT to ABSINGLE. The easiest way, perhaps, is to delete ABDEFECT from the field in the center of the window, click ABSINGLE in the list of variables, and move it with the arrow. Your window should look like this:



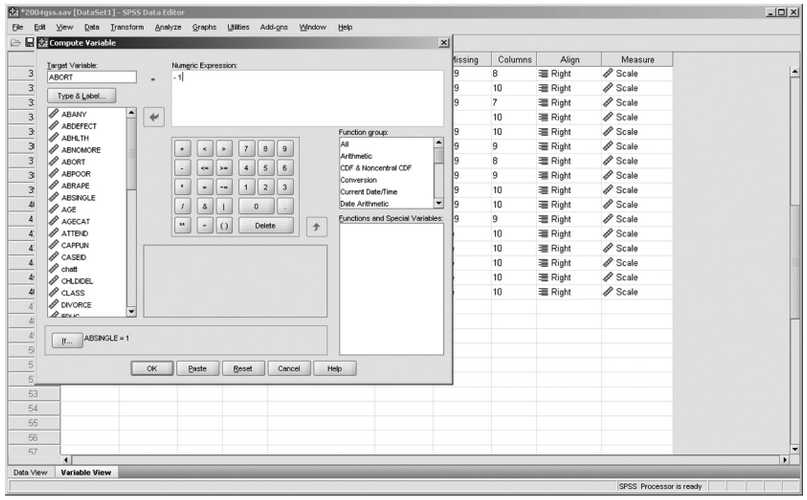
Click "Continue," then click "OK." When asked whether you want to change the variable, click "OK."

Our index is nearly complete now. However, we must take account of the people who did not answer either or both of the questions included in the index, people scored as "missing data."

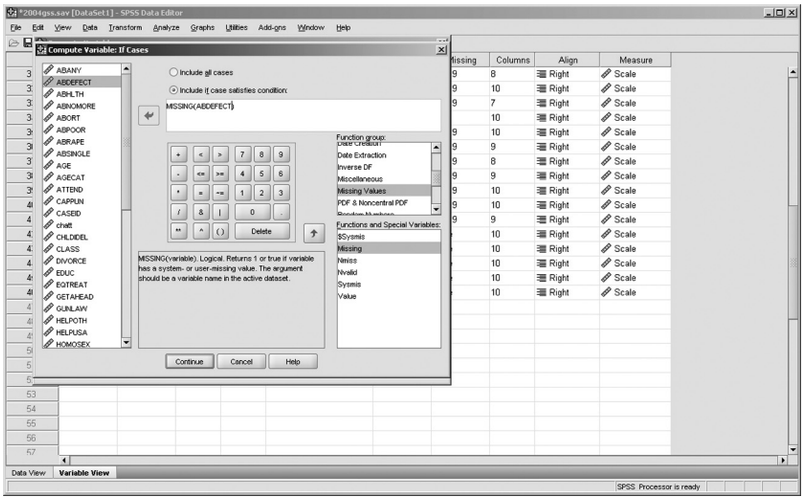
Recall that so far, we gave everyone a score of 0 to begin with, and then respondents who scored 1 on ABDEFECT or ABSINGLE were given additional points. Those who had missing data on the two items are still scored 0 on our index. Thus they look as though they are strongly opposed to abortion, whereas they were actually never asked about it.

To complete our index, then, we must create a missing data code for ABORT and assign that code to the appropriate cases. Let's use –1 because that has no meaning on the index.

Return to "Transform → Compute." Put –1 into the "Numeric Expression" field and click "If" to tell SPSS when we want the –1 code assigned on ABORT.



Instead of specifying a numeric value for ABDEFECT and ABSINGLE, we are going to use the list of functions found on the right side of the window. Scroll down the list until you find "Missing Values." Select it and then choose from the list below called "Functions and Special Values." We want to choose the "Missing" option. When we do, the description of what that includes is to the left. This explains that any respondent who is system- or user-missing (meaning that they didn't answer the question or they weren't asked the question) will be included among the missing.



Notice that the expression now has a highlighted question mark. Replace the highlighted question mark this time by selecting and transferring the variable name ABDEFECT.

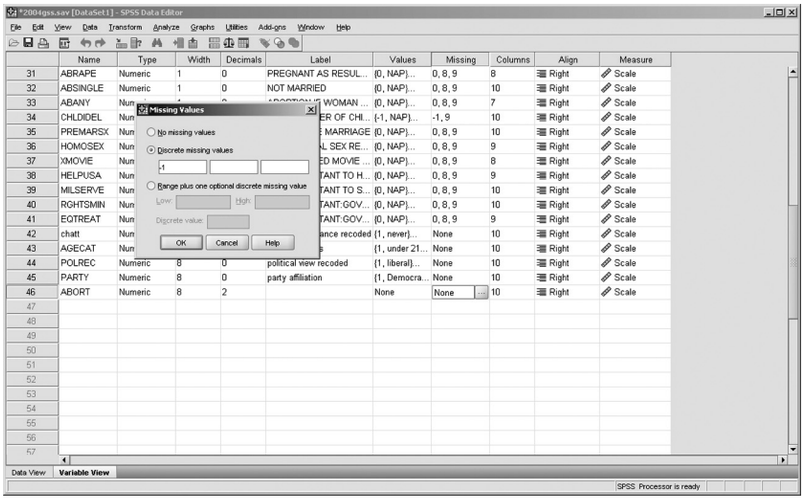
We have now created the following instruction for SPSS: If a person has a missing data code on ABDEFECT, we want that person scored as –1 on the index ABORT. Once you understand the logic of this instruction, click "Continue," then click "OK" to execute the instruction.

Now repeat the same procedure using ABSINGLE where you simply replace ABDEFECT with ABSINGLE.

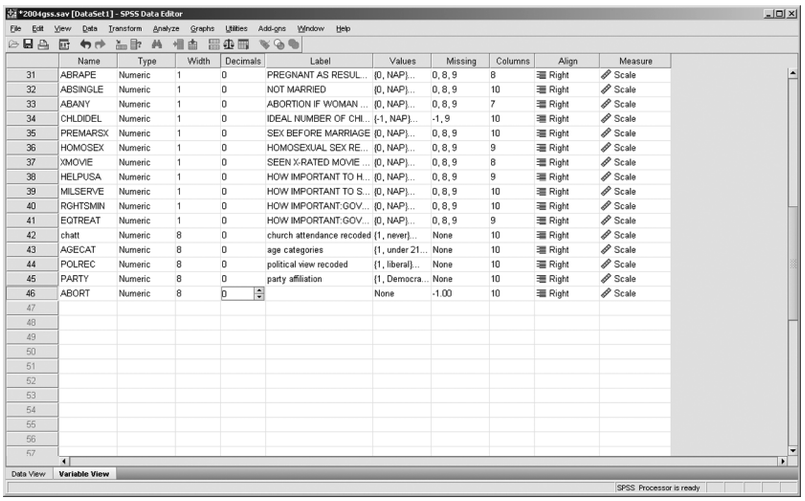
Our index is almost complete now, but we want to make two modifications to it.

In the "Variable View" of the "Data Editor" window, find and select the new variable, ABORT, at the bottom. Once you've done that, select the box in the "Missing" column for the new variable.

Notice that the index currently has "None" listed as missing. Click on the small gray box. Click "Discrete missing values" and type –1 into the first box underneath it. This tells SPSS that we have assigned that numeric score for all cases that got no index score on ABORT.



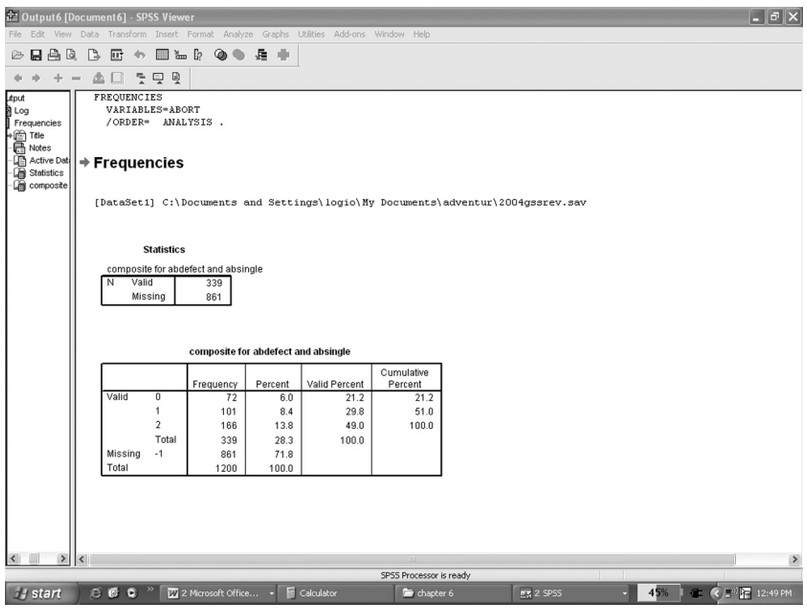
Once you are satisfied with the instruction, click "OK" to return to the "Variable View" window.



	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure
31	ABRAPE	Numeric	1	0	PREGNANT AS RESUL...	{0, NAP}...	0, 8, 9	8	Right	Scale
32	ABSINGLE	Numeric	1	0	NOT MARRIED	{0, NAP}...	0, 8, 9	10	Right	Scale
33	ABANY	Numeric	1	0	ABORTION IF WOMAN ...	{0, NAP}...	0, 8, 9	7	Right	Scale
34	CHLDIDEL	Numeric	1	0	IDEAL NUMBER OF CHI...	{-1, NAP}...	-1, 9	10	Right	Scale
35	PREMARSX	Numeric	1	0	SEX BEFORE MARRIAGE	{0, NAP}...	0, 8, 9	10	Right	Scale
36	HOMOSEX	Numeric	1	0	HOMOSEXUAL SEX RE...	{0, NAP}...	0, 8, 9	9	Right	Scale
37	XMOVIE	Numeric	1	0	SEEN X-RATED MOVIE ...	{0, NAP}...	0, 8, 9	8	Right	Scale
38	HELPUSA	Numeric	1	0	HOW IMPORTANT TO H...	{0, NAP}...	0, 8, 9	9	Right	Scale
39	MILSERVE	Numeric	1	0	HOW IMPORTANT TO S...	{0, NAP}...	0, 8, 9	10	Right	Scale
40	RGHTSMIN	Numeric	1	0	HOW IMPORTANT:GOV...	{0, NAP}...	0, 8, 9	10	Right	Scale
41	EQTREAT	Numeric	1	0	HOW IMPORTANT:GOV...	{0, NAP}...	0, 8, 9	9	Right	Scale
42	chatt	Numeric	8	0	church attendance recoded	{1, never}...	None	10	Right	Scale
43	AGECAT	Numeric	8	0	age categories	{1, under 21...	None	10	Right	Scale
44	POLREC	Numeric	8	0	political view recoded	{1, liberal}...	None	10	Right	Scale
45	PARTY	Numeric	8	0	party affiliation	{1, Democra...	None	10	Right	Scale
46	ABORT	Numeric	8	0		None	-1.00	10	Right	Scale

As we did the last time we were here, we want to set the number of decimal places to 0. Click on the box in the "Decimals" column and use the arrows to bring the 2 to a 0. We will not enter any labels at this point. Just go back to the "Data View" window, where you will see ABORT with its codes of –1, 0, 1, and 2.

Now let's see whether all this really accomplished what we set out to do. Use the "Frequencies" command to find out. Run the frequency distribution of ABORT, and you should see this table on your screen now:



If you compare the index scores in this table with the crosstabs of the two component variables, you'll see a logical correspondence. In the earlier table, 72 people disapproved of abortion under both of the specified conditions; here we find that 72 people scored 0 on the index. And whereas we found that 97 people

would approve abortion for birth defects but not for a single woman and 4 had the reverse view, the index shows 101 people (97 + 4) with a score of 1. Finally, the 166 people who approved of abortion in both cases are now scored 2 on the index. Notice also the 861 people who were excluded on the basis of missing data.

Congratulations! You've just created a composite index. We realize you may still be wondering why that's such good news. After all, it wasn't your idea to create the thing in the first place.

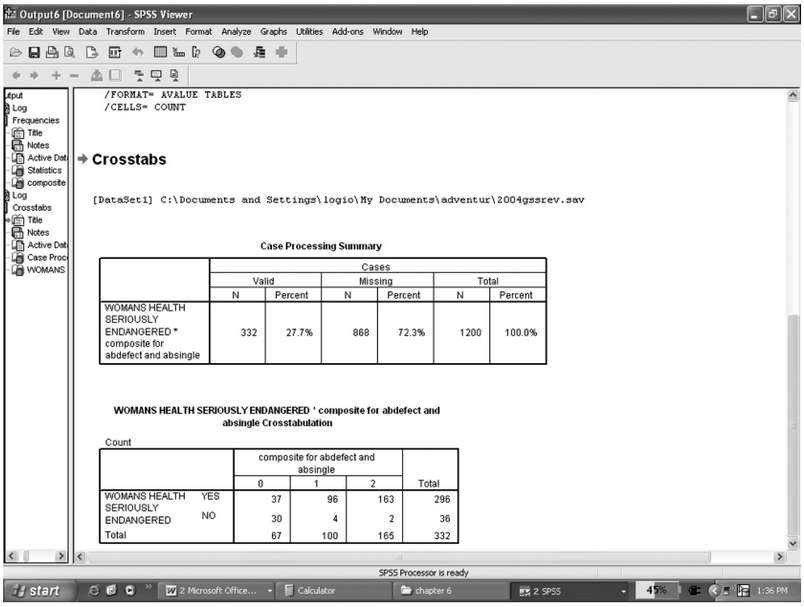
6.3 Checking to See How the Index Works

To get a clearer idea of the value of such a composite measure, let's move on to the next step in the process we've launched. Let's check whether the index works. Does it pull together and summarize all its components?

In creating the simple index, we've tried to put respondents in one of three groups: those strongly supportive of abortion, those strongly opposed, and those in the middle. If we've succeeded in that effort, the scores we've assigned people on the new index, ABORT, should help us predict how people answered other abortion items on the questionnaire. Let's begin with their answers to ABHLTH: approving abortion for a woman whose health is in danger.

To undertake this test of the index, we'll return to the "Crosstabs" command, introduced earlier in the chapter. As you'll see, it has some additional features that can be used to good effect. In this instance, we want to cross-classify people in terms of their scores on the index and on the variable ABHLTH.

Run the "Crosstabs" command with ABHLTH as the row variable and ABORT as the column variable. Here's the result you should get:

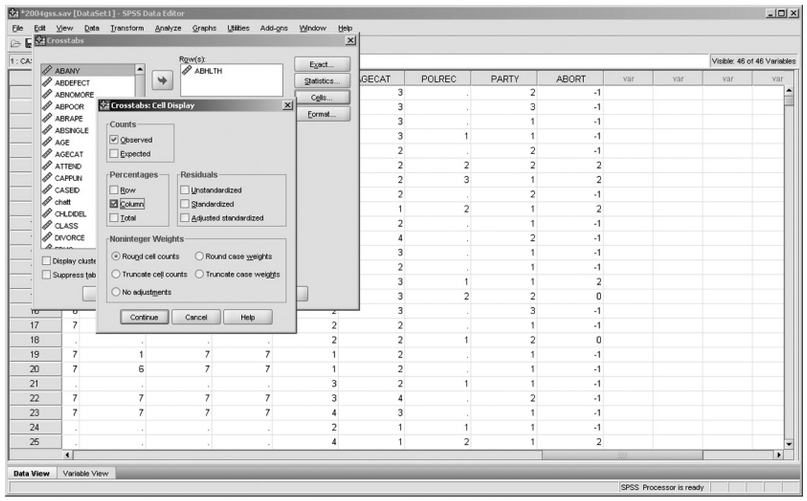


You may be able to look at this table and see the relationship between the index and ABHLTH, but the analysis will be much simpler if we convert the data in the table to percentages. Let's express the assumption of validity we are testing in terms of percentages. If respondents with a score of 2 on the index are the most

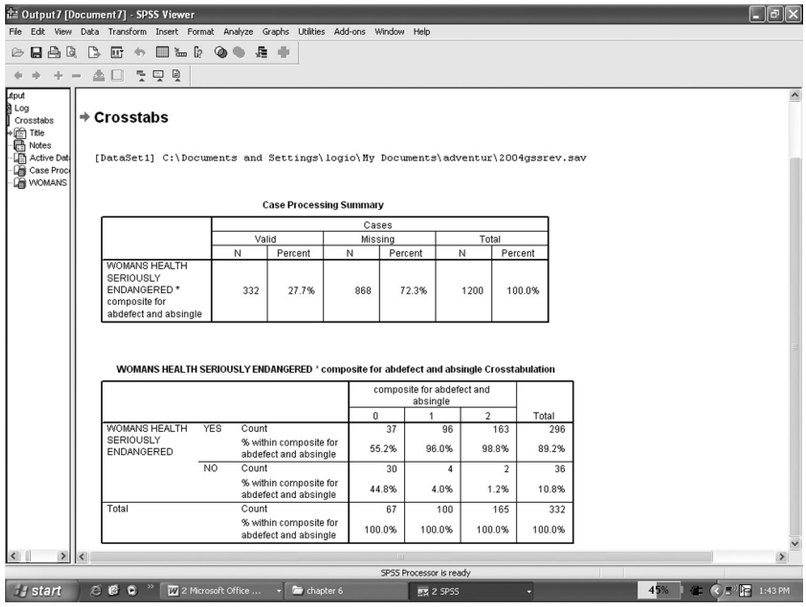
supportive of abortion, we should expect to find a higher percentage of them approving of abortion in the case of the woman's health being endangered than would be found among the other groups. Those scored 0 on the index, by contrast, should be the least likely—the smallest percentage—to approve of abortion based on the woman's health.

Looking first at those with a score of 0, in the leftmost column of the table, we would calculate the percentage as follows. Of the 67 people scored 0, we see that 37 approved of abortion in the case of ABHLTH. Dividing 37 by 67 indicates that these 37 people are 55.22% of the total 67. Looking to those scored 2, in the rightmost column, we find that the 163 who approve represent 98.79% of the 165 with that score. These two percentages support the assumption we are making about the index; it does seem to be working.

Fortunately, SPSS can be instructed to calculate these percentages for us. In fact, we are going to be looking at percentage tables for the most part in the rest of this book. Go back to the "Crosstabs" window. Your previous request should still be in the appropriate fields. Notice a button at the bottom of this window marked "Cells." Click it. This will take you to a new window as shown here:



Notice that you can choose to have SPSS calculate percentages for you in one of three ways: either down the columns, across the rows, or total percentages. Click "Columns" and work your way back through the "OKs" to have SPSS run the table for you. The result should look like the following:



Output7 [Document7] - SPSS Viewer

File Edit View Data Transform Insert Format Analyze Graphs Utilities Add-ons Window Help

Output
Log
Crosstabs
Title
Notes
Active Dat
Case Proc
WOMANS

Crosstabs

[DataSet1] C:\Documents and Settings\logio\My Documents\adventur\2004gssrev.sav

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
WOMANS HEALTH SERIOUSLY ENDANGERED * composite for abdefect and absingle	332	27.7%	868	72.3%	1200	100.0%

WOMANS HEALTH SERIOUSLY ENDANGERED * composite for abdefect and absingle Crosstabulation

			composite for abdefect and absingle			Total
			0	1	2	
WOMANS HEALTH SERIOUSLY ENDANGERED	YES	Count	37	96	163	296
		% within composite for abdefect and absingle	55.2%	96.0%	98.8%	89.2%
	NO	Count	30	4	2	36
		% within composite for abdefect and absingle	44.8%	4.0%	1.2%	10.8%
Total		Count	67	100	165	332
		% within composite for abdefect and absingle	100.0%	100.0%	100.0%	100.0%

SPSS Processor is ready

start 2 Microsoft Office ... chapter 6 2 SPSS 45% 1:43 PM

Take a moment to examine the logic of this table. For each score on the index, we have calculated the percentage of respondents saying they favor or oppose a woman's right to an abortion if her health is seriously endangered. It is as though we have limited our attention to one of the index score groups (e.g., those scored 0) and described them in terms of their attitudes on the abortion item; then we have repeated the process for each of the index score groups. Once we've described each of the subgroups, we can compare them.

When you have created a table with the percentages totaling to 100 down each column, the proper way to read the table is across the rows. Rounding off the percentages to simplify matters, we would note, in this case, that 55% of those scored 0 on the index, 96% of those scored 1 on the index, and 99% of those scored 2 on the index said they would approve of abortion if the woman's health were seriously endangered. This table supports our assumption that the index measures levels of support for a woman's freedom to choose abortion.

Now let's check the index using the abortion variables not included in the index itself. Repeat the "Crosstabs" command, substituting the four other abortion items—ABNOMORE, ABRAPE, ABPOOR, and ABANY—for ABHLTH.

Run the "Crosstabs" command now and see what results you get. Look at each of the four tables and see what they say about the ability of the index to measure attitudes toward abortion. Here is an abbreviated table format that you might want to construct from the results of that command. SPSS doesn't create a table like this, but it's a useful format for presenting data in a research report.

Percentage of respondents who approve of abortion under various circumstances:

	Abortion Index		
Circumstance	*0*	*1*	*2*
When the woman was raped	27	86	99
The couple can't afford more children	0	27	92
The couple doesn't want more children	1	24	92
The woman wants an abortion	1	15	92

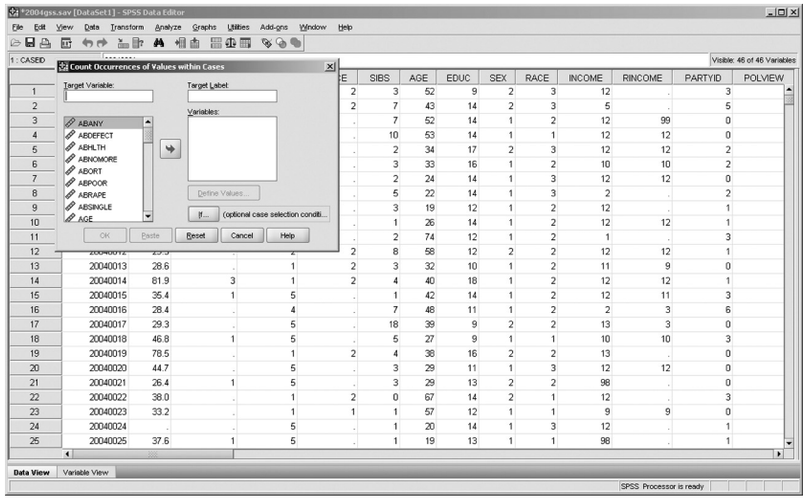
Whereas the earlier table showed the percentages who approved and disapproved of abortion in specific situations, this table presents only those who approved. The first entry in the table, for example, indicates that 27% of those scored 0 on the index would approve of abortion for a woman who was raped. Of those scored 1 on the index, 86% approved of abortion for this reason, and 99% of those scored 2 approved.

As you can see, the index accurately predicts differences in responses to each of the other abortion items. In each case, those with higher scores on the index are more likely to support abortion under the specified circumstances than those with lower scores on the index.

By building this composite index, we've created a more sophisticated measure of attitudes toward abortion. Whereas each of the individual items allows only for approval or disapproval of abortion under various circumstances, this index reflects three positions on the issue: unconditional disapproval (0), conditional approval (1), and unconditional approval (2).

6.4 Creating a More Complex Index With Count

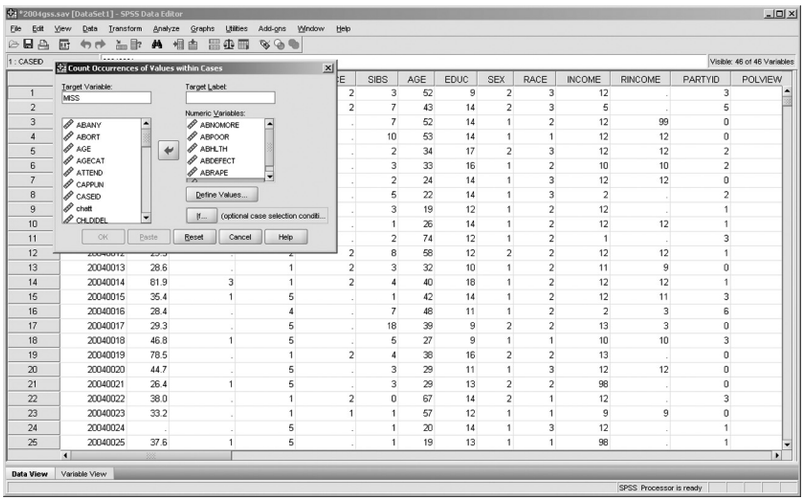
This first index was created from only two of the abortion items, but we could easily create a more elaborate index, using more items. To illustrate, let's use all the items except for ABANY (supporting a woman's unrestricted choice). Although we could create this new index by following the same procedures as before, there is also a shortcut that we can use when we want to score several items the same way in creating the index. Suppose that we want to create a larger index by giving people one point for agreeing to an abortion in each of the six special circumstances. From the "Transform" menu, select "Count." Then select "Count Values within Cases." This will present you with the following window:



In creating our new index, we will once more need to deal with the problem of missing values. In using "Count," we are going to handle that matter somewhat

differently from before. Specifically, we are going to begin by creating a variable that tells us whether people had missing values on any of the six items we are examining. To do this, we'll create a variable called MISS. Type that name in the "Target Variable" field.

Next, we want to specify the items to be considered in creating MISS. Transfer the following variable names to the "Variables" field: ABDEFECT, ABHLTH, ABNOMORE, ABPOOR, ABRAPE, and ABSINGLE. You can do this by selecting a variable in the list on the left side of the window and clicking the arrow pointing to the "Variables" field, or you can simply double-click a variable name. Where several variables are together in the list, you can click and drag your cursor down the several names, selecting them all, and then click the arrow. Be careful, though. The ABORT variable we just created is in the list, but we do not want to transfer it to the "Variables" field. Only the six variables (ABDEFECT, ABHLTH, ABNOMORE, ABPOOR, ABRAPE, and ABSINGLE) should be listed.

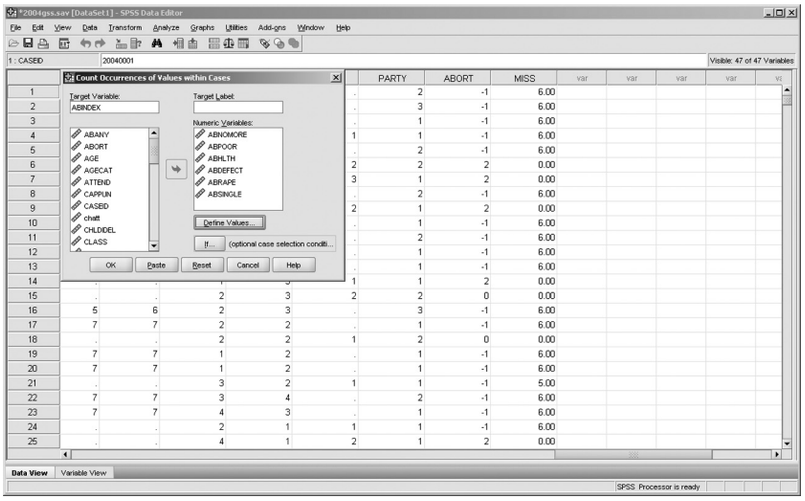


Having selected the variables to be counted, click "Define Values."

The left side of the window offers several options for counting, but we want to use the simplest: a single value. Click the button beside "System- or user-missing." Click the "Add" button to transfer the value to the "Values to Count" field. "MISSING" will now appear in that space. Click "Continue" to return to the "Count Occurrences" window.

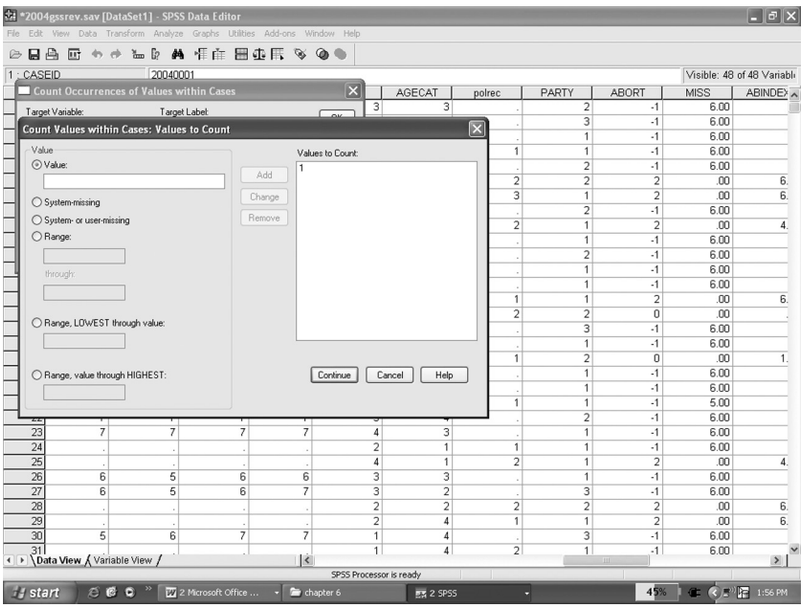
Click "OK" to launch the procedure. Once SPSS has completed the procedure, you will find yourself looking at the "Output" window. Switch over to the "Data" window with the "Data View" tab forward and scroll to the end to see the last variable. There will be a new variable called MISS, with scores ranging from 0 to 6, indicating the number of missing values people had on the six items.

Now we are ready to create our new abortion index. Select "Count Values within Cases" from the "Transform menu" again. Notice that our earlier specifications are still there; these will be very useful to us.



Replace MISS with ABINDEX in the "Target Variable" field. Click "Define Values." In the "Values to Count" window, you'll notice that MISSING is still showing in the specification field. Click it to select it. Then click "Remove." Now the field is empty.

Click the first option on the left, "Value," and type "1" in the field beside it. Click "Add" to transfer the value to the appropriate field.

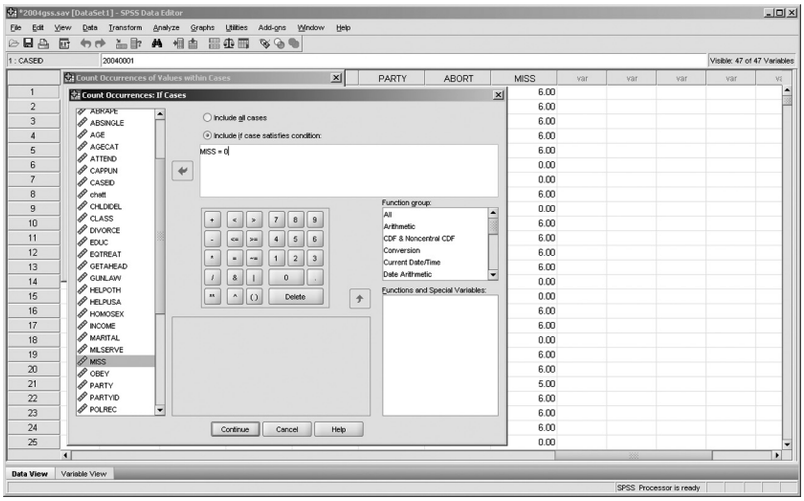


Then click "Continue." Because we left the six variable names in the "Numeric Values" field, we have now told SPSS to count the number of times a person had a score of 1 on any of those six items.

Before having SPSS do its counting, however, we can use the MISS index we created a moment ago.

Click "If." In the "If Cases" window, click "Include if case satisfies condition." Notice that the list of variables on the left is activated by that. You can either find

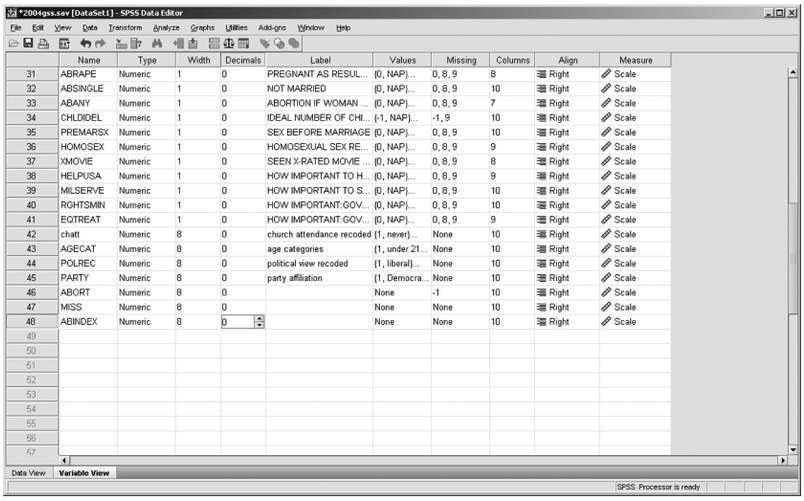
MISS in that list and transfer it or simply type MISS in the field. Then add "= 0" after MISS. You can either type it in or use the keypad. We have just told SPSS that we want it to count pro-choice answers only for those who had no missing values on any of the six items.



Click "Continue" and notice that the "If" field at the bottom of the window now contains our specification. Click "OK" to launch the counting.

Soon you should be looking at the "Data" window. Go to the rightmost column in the window and you will find ABINDEX. Some of the cells have scores between 0 and 6, and some have a simple period (indicating missing data).

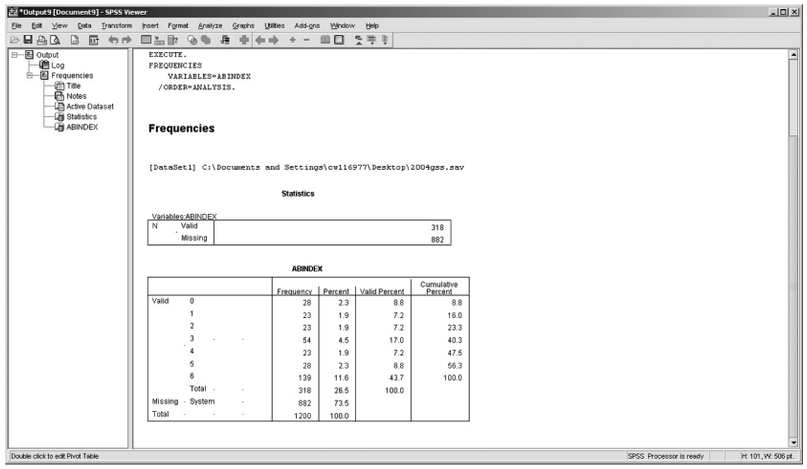
Now we need to tidy up our new variable. Click on the "Variable View" tab. Go to ABINDEX in the last row. Click on the "Decimals" box and change the number of decimal places to 0.



	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure
31	ABRAPE	Numeric	1	0	PREGNANT AS RESUL...	{0, NAP}...	0, 8, 9	8	Right	Scale
32	ABSINGLE	Numeric	1	0	NOT MARRIED	{0, NAP}...	0, 8, 9	10	Right	Scale
33	ABANY	Numeric	1	0	ABORTION IF WOMAN ...	{0, NAP}...	0, 8, 9	7	Right	Scale
34	CHLDIDEL	Numeric	1	0	IDEAL NUMBER OF CHI...	{-1, NAP}...	-1, 9	10	Right	Scale
35	PREMARSX	Numeric	1	0	SEX BEFORE MARRIAGE	{0, NAP}...	0, 8, 9	10	Right	Scale
36	HOMOSEX	Numeric	1	0	HOMOSEXUAL SEX RE...	{0, NAP}...	0, 8, 9	9	Right	Scale
37	XMOVIE	Numeric	1	0	SEEN X-RATED MOVIE ...	{0, NAP}...	0, 8, 9	8	Right	Scale
38	HELPUSA	Numeric	1	0	HOW IMPORTANT TO H...	{0, NAP}...	0, 8, 9	9	Right	Scale
39	MILSERVE	Numeric	1	0	HOW IMPORTANT TO S...	{0, NAP}...	0, 8, 9	10	Right	Scale
40	RGHTSMIN	Numeric	1	0	HOW IMPORTANT:GOV...	{0, NAP}...	0, 8, 9	10	Right	Scale
41	EQTREAT	Numeric	1	0	HOW IMPORTANT:GOV...	{0, NAP}...	0, 8, 9	9	Right	Scale
42	chatt	Numeric	8	0	church attendance recoded	{1, never}...	None	10	Right	Scale
43	AGECAT	Numeric	8	0	age categories	{1, under 21...	None	10	Right	Scale
44	POLREC	Numeric	8	0	political view recoded	{1, liberal}...	None	10	Right	Scale
45	PARTY	Numeric	8	0	party affiliation	{1, Democra...	None	10	Right	Scale
46	ABORT	Numeric	8	0		None	-1	10	Right	Scale
47	MISS	Numeric	8	0		None	None	10	Right	Scale
48	ABINDEX	Numeric	8	0		None	None	10	Right	Scale

Go back to the "Data View" window.

Let's see what these instructions produced. Get the frequency distribution of ABINDEX. Here's what you should find:



```
EXECUTE.
FREQUENCIES
  VARIABLES=ABINDEX
  /ORDER=ANALYSIS.
```

Frequencies

[DataSet1] C:\Documents and Settings\cw116977\Desktop\2004gss.sav

Statistics

Variables ABINDEX

N	Valid	318
	Missing	882

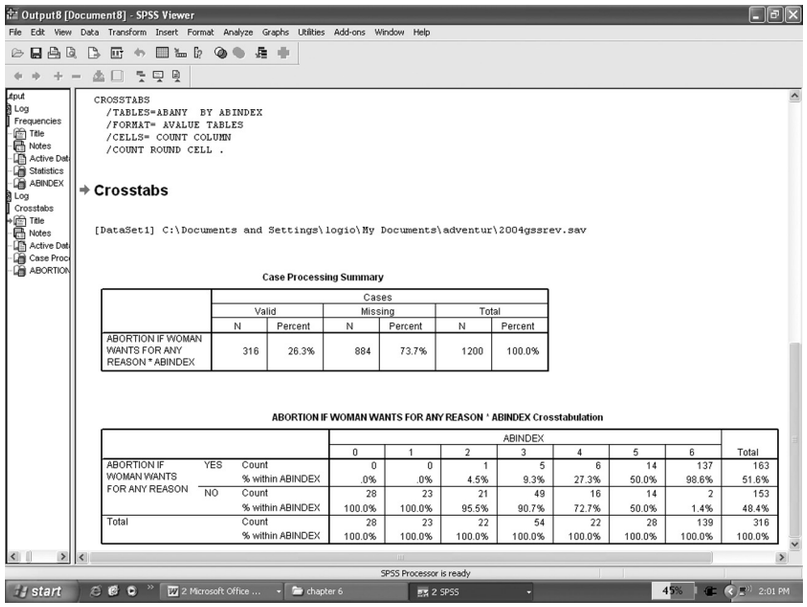
ABINDEX

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	28	2.3	8.8	8.8
	1	23	1.9	7.2	16.0
	2	23	1.9	7.2	23.3
	3	54	4.5	17.0	40.3
	4	23	1.9	7.2	47.5
	5	28	2.3	8.8	56.3
	6	139	11.6	43.7	100.0
	Total	318	26.5	100.0	
Missing	System	882	73.5		
Total		1200	100.0		

This table shows the distribution of scores on the new index, ABINDEX. (Use the scroll bar on the right-hand side of the window to move the output text up and down so that you can see whatever output you want to look at.) As you can see, there are 139 people, more than two-fifths of those with opinions, who support abortion in all the specified circumstances. A total of 28 disapprove of abortion in any of those circumstances. The rest are spread out according to the number of conditions they feel would warrant abortion.

For validation purposes this time, we have only one item not included in the index itself: ABANY. Let's see how well the index predicts respondents' approval of a woman's unrestricted choice of abortion.

Run the "Crosstabs" procedure, specifying ABANY as the row variable, ABINDEX as the column index, and cells to be percentaged by column.



```
CROSSTABS
  /TABLES=ABANY  BY ABINDEX
  /FORMAT= AVALUE TABLES
  /CELLS= COUNT COLUMN
  /COUNT ROUND CELL .
```

Crosstabs

[DataSet1] C:\Documents and Settings\logio\My Documents\adventur\2004gssrev.sav

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
ABORTION IF WOMAN WANTS FOR ANY REASON * ABINDEX	316	26.3%	884	73.7%	1200	100.0%

ABORTION IF WOMAN WANTS FOR ANY REASON * ABINDEX Crosstabulation

			ABINDEX							
			0	1	2	3	4	5	6	Total
ABORTION IF WOMAN WANTS FOR ANY REASON	YES	Count	0	0	1	5	6	14	137	163
		% within ABINDEX	.0%	.0%	4.5%	9.3%	27.3%	50.0%	98.6%	51.6%
	NO	Count	28	23	21	49	16	14	2	153
		% within ABINDEX	100.0%	100.0%	95.5%	90.7%	72.7%	50.0%	1.4%	48.4%
Total		Count	28	23	22	54	22	28	139	316
		% within ABINDEX	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Looking at the SPSS output, using the scroll bars if necessary, we can see that answers to ABANY are closely related to scores on ABINDEX. Of those with 0 on

the index, no one said a woman had a right to an abortion for any reason. No one who scored 1 on ABINDEX favored a woman's right to an abortion for any reason either. For the scores 2 through 6, the percentage continues increasing across the index until we find that 98.6% of those scored 6 on the index say a woman has the unconditional right to an abortion. (You may have to scroll over to the right to see the entire table with all the columns.)

Once again, we find that the index works well. This means that if we want to analyze peoples' attitudes toward abortion further (and we will), we have the choice of using a single item to represent those attitudes or using a composite measure. If we've constructed the index well, it should be superior to any one of its component parts, providing much more information about a particular topic. Moreover, we've seen that we can create such an index in different ways.

6.5 Creating the FBI Crime Index

To take a very different example of creating a composite index, we will follow the simple steps necessary to create perhaps the most famous composite index in criminal justice. To do this, we'll use another file from the Web site, so give SPSS the commands necessary to open the "JUSTICE.SAV" file. Once you've opened this file, follow this chapter's instructions to combine the crimes mentioned at the beginning of this chapter into an overall index. This index will be a simple addition of the component crimes into an overall sum of those crimes for each state. It is a simple index because none of the variables has any missing data. The index will include the following items:

- Murder and nonnegligent manslaughter
- Forcible rape
- Robbery
- Aggravated assault
- Burglary
- Larceny and theft
- Motor vehicle theft

6.6 Secondhand Binge Effects: Creating an Index

How about a real challenge? A final example of index construction asks you to begin by opening the "BINGE.SAV" file. Concentrate your efforts on constructing an index that combines the survey items in which a student reports having experienced some problem as the result of the drinking of some other student. Just as "secondhand smoke" means that someone else's smoking causes a nonsmoker to suffer some of the same ill effects as a smoker, "secondhand binge" means that nonbingeing students suffer those effects. This example is a bit more challenging than the last one. It will involve several steps. First, the index should include only nonbingeing students. Next, because you want to examine the impact of binge drinking on students who live on campus, make the index include only students who live in dormitories, fraternities, or sororities. Finally, include the following items from the College Alcohol Study, asking whether a student experienced each of these:

- Been insulted or humiliated
- Had a serious argument or quarrel
- Been pushed, hit, or assaulted
- Had your property damaged
- Had to "baby-sit" or take care of another student who drank too much
- Had your studying or sleep interrupted
- Experienced an unwanted sexual advance
- Been a victim of sexual assault or date rape

You can create an index that should count up the number of secondhand binge effects that a student experienced. Because there are eight items, this index can vary from 0 to 8. Remember to construct this index variable taking missing values into account.

6.7 Summary

In this chapter, we've seen that it is often possible to measure criminal justice and other social scientific concepts in a number of ways. Sometimes the data set contains a single item that does the job nicely. Measuring gender by asking people for their gender is a good example.

In other cases, the mental images that constitute our concepts (e.g., attitudes about abortion, serious crime in a state, or the experience of secondhand binge effects) are varied and ambiguous. Typically, no single item in a data set provides a complete representation of what we have in mind. Often we can resolve this problem by combining two or more indicators of the concept into a composite index. As we've seen, SPSS offers the tools necessary for such data transformations.

If you continue your studies in criminal justice research, you will discover many more sophisticated techniques for creating composite measures. However, the simple indexing techniques you have learned in this chapter will serve you well in the analyses that lie ahead.

Key Terms

composite measures
contingency table
crosstab
crosstabulation
multiple indicators

Student Study Site

Log on to the Web-based student study site at http://www.sagepub.com/logiostudy for access to the data sets referred to in the text and additional study resources.