PASW Primer

An Introduction to the **Predictive Analytics Software**

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Introduction

Predictive **A**nalytics **S**oft**W**are is a program used by social scientists to analyze quantitative data. Knowing how to enter and analyze data using PASW will help you: 1) conduct social science research, 2) counsel clients in the public and private sectors, and 3) learn similar statistical software packages designed for quantitative research in the social sciences.

Using PASW consists of three related tasks: 1) entering data, 2) arranging data to fit the needs of the research questions, and 3) analyzing data to understand human behavior. Entering data requires understanding the properties of a spreadsheet. Managing data requires understanding issues of measurement, such as creating scales or segmenting data into sub-populations. Analyzing data requires understanding descriptive and inferential statistics. This primer explains and provides examples of how to use PASW (Version 17) to accomplish these tasks.

The primer assumes we want to test a theory by using quantitative data analysis. Figure 1 (page 20) shows this theory as a graphic. We are interested in understanding the determinants of consumer trust in food processing companies. The theory posits that trust results from two independent variables: 1) a perception that food processing companies have the expertise to produce safe food (i.e., Competence), and 2) a perception that food processing companies will act with honesty and integrity in producing safe food (i.e., Confidence). The theory contains five statistical controls: age, sex, education, income, and whether the respondent within the past 12 months has become ill from eating food. We collected data using the questionnaire shown on pages 21-22. We want to enter the data into a PASW system file and analyze it to determine the extent to which it supports our theory of trust.

Your PASW Exercise folder should contain these files:

1. PASW Blank. This is a PASW system file.
2. PASW Complete. This is a PASW system file.
3. PASW Original. This is a PASW system file.
4. PASW Primer. This is an Adobe Acrobat file.

As you work with this primer, you will create four additional files:

1. PASW Example. This is a PASW system file.
2. PASW Revised. This is a PASW system file.
3. Syntax Data Management. This is a PASW text file.
4. Syntax Data Analsysis. This is a PASW text file.

This exercise requires that you work on a computer with PASW installed. All the computers located in 64 Heady Hall have PASW installed on them.

Step 1. Entering Data

The data used for this primer were collected as part of a nationwide study regarding consumer trust in the U.S. food system. An abbreviated version of the questionnaire appears on pages 21-22.

Variables

First, we decide what information we want to enter into a PASW data file. Certainly, we want to enter the responses to the questions asked on the questionnaire. At the same time, we might want to enter more information in addition to the responses. For example, we might want to enter the respondent's identification number that appears on each questionnaire.

Once we decide what variables to include in our PASW file, we open PASW and enter into it names for these variables. A PASW name must be 8 characters or fewer, cannot contain special characters or blanks, and must begin with a letter (PASW names are not case sensitive). Note that it is not *necessary* to create new names for the variables because a blank PASW file contains columns with names already in them, such as VAR00001, var..., and so on. Still, creating new names for variables can make it easier to work with them during the analysis. For example, it might be difficult to remember that VAR00012 is the age of the respondent, but it is easy to recognize that a variable named AGE is the age of the respondent.

Other Information

After deciding what variables to enter into a PASW file and creating names for each one, we can add more information to the file to help us understand our data and work with it. We will discuss this additional information once we have created a PASW file.

Example

Suppose that 5 persons have completed the questionnaire included in this primer. Table 1 (page 4) shows their responses and the identification number assigned to each one. We will enter these data into a PASW file once it is prepared for data entry.

1. Open the PASW Blank file in the PASW Primer folder.
   a. The tabs at the bottom of the screen read, Data View and Variable View.
   b. Click on Data View.
   c. Notice that the columns in Data View are labeled, VAR00001, var..., and so on. These are the variable names. The rows are numbered consecutively, beginning at one. Thus, each row represents a respondent (or observation) in the data set.
2. We want to rename the variables to help us recognize what they measure.
   a. Click on the Variable View tab at the bottom of the screen. Now, the variables are listed as rows and information about them is listed in columns.
   b. Double click in row one under column one ("Name"); change the name of VAR00001 to ID to refer to the identification number for each respondent.
   c. Add names for the other variables we will use, one row at a time:

Name	Description of the Variable
ID	The respondent's ID number.
COMP1	Q1: The first question about Competence.
COMP2	Q2: The second question about Competence.

COMP3	Q3: The third question about Competence.
COMP4	Q4: The fourth question about Competence.
CONF1	Q5: The first question about Confidence.
CONF2	Q6: The second question about Confidence.
CONF3	Q7: The third question about Confidence.
CONF4	Q8: The fourth question about Confidence.
TRUST1	Q9: The first question about Trust
TRUST2	Q10: The second question about Trust.
TRUST3	Q11: The third question about Trust.
AGE	Q12: The age of the respondent.
SEX	Q13: The sex of the respondent.
EDUC	Q14: The number of years of formal education.
INCOME	Q15: The total household income before taxes.
ILLNESS	Q16: Become ill from eating food in the past 12 months.

3. Add other information about the variables.

   a. Column two in Variable View reads *Type*, which refers to whether the variable is an alphanumeric ("string") variable or a numeric variable. Numeric is the default, which is correct for all our variables except SEX, which is entered as M and F.
      - Click on the second column (i.e., *Type*) next to SEX.
      - Click on the grey-colored icon and a dialogue box will appear.
      - Click on "String" and then on OK.
   b. Column three in Variable View is *Width*. PASW sets these figures for us. Because *Width* can be wider than needed, it is not necessary to alter this column.
   c. Column four in Variable View is *Decimals*. Often, PASW assigns two decimal places as the default. Thus far, none of our variables requires decimal places.
      - Click on each row of this column and change the number of decimals to 0.
   d. Column five in Variable View is *Label*. This is a description given to the variable. For example, for COMP1, we might type, "I receive a Competencement for the work I do" to help us recall the question that was used for this variable. We will leave this column blank.
   e. Column six in Variable View is *Values*. This column names the response categories used for each variable. For example, for COMP1, we might want to recall that 0 = Strongly Disagree and 10 = Strongly Agree.
      - Click on the cell in Column six (i.e., *Values*) for the variable COMP1.
      - Click on the grey-colored icon and a dialogue box will appear.
      - Enter "0" for Value and "Strongly Disagree" for Label.
      - Click on Add.
      - Enter "10" for Value and "Strongly Agree" for Label.
      - Click on Add.
      - Click on Ok to return to Variable View.
      - We want these same labels to apply through row 12 (TRUST3). So, for COMP1, where we already have value labels, right click the cell, and then click on "copy."
      - For the next 10 rows, right click and click on "paste."
      - Enter appropriate labels for AGE, SEX, EDUC, INCOME, and ILLNESS.
   f. Column seven in Variable View is *Missing*. If data are missing, one can simply leave the data cell blank and PASW will provide a "." This [dot] symbol indicates missing data. In some cases, one might have other indications of missing data. For example, one might designate "999" as missing data. If this is the case, you will want to let PASW know that "999" indicates missing data. We will use [dot] to indicate missing data; so, there is no need to change Column seven.

g. Column eight in Variable View is *Columns*. This column has about the same meaning as *Width*. PASW sets it for you, and most often there is no need to change it.
h. Column nine in Variable View is *Align*. You can choose to align the data in each cell to the left, center, or right.
i. Column ten in Variable View is *Measure*. This column informs PASW about the level of measurement for each variable. We will consider all of our variables except SEX and ILLNESS as "scale" variables. SEX and ILLNESS will be treated as nominal.
   - In turn, click on the cells in column ten for SEX and ILLNESS and then on the grey-colored icon for each cell.
   - In turn, click on nominal for SEX and ILLNESS.

4. Now, the PASW file is prepared for entering data.
   a. Click on Data View.
   b. Enter the information shown below from each of the five respondents into the appropriate cells, one row per respondent.
   c. Save this file with the name, *PASW Example*.

Table 1. Data for five respondents to the example questionnaire.

ID#	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
3	10	0	8	8	8	8	7	3	9	9	2	3	F	2	1	0
8	10	2	6	6	6	3	4	7	6	4	5	5	F	3	1	0
9	8	2	9	6	9	8	9	3	8	6	4	2	M	3	2	0
10	1	9	5	2	0	0	2	10	1	1	5	6	F	4	2	1
12	9	3	6	6	7	7	7	3	7	7	3	2	F	2	2	0

Step 2. Managing Data

We need to make some adjustments to the data before we begin our analysis of it. Resave PASW Example as you complete each of the procedures described below.

Reverse Coding of Selected Variables

Notice on the questionnaire that Q2, Q8, and Q11 are worded in the opposite direction than the other questions (e.g., Q2: "Food processing companies need more training to produce safe food"). We can use three different procedures to reverse the coding on these variables so that the responses conform in direction with those of the other variables. One procedure is described here. The other two procedures are described in Appendix A (page 12).

1. View PASW Example in Data View.
2. Click on Transform: Compute Variable.
3. In the box *Target Variable*, type COMP2R (to refer to reverse coding for COMP2).
4. In the box *Numeric Expression*, type: 10 – COMP2
5. Click Ok.
6. Repeat this procedure for CONF4 (*Target Variable* = CONF4R) and TRUST3 (*Target Variable* = TRUST3R).
7. Save PASW Example.

Recoding a String Variable to a Numeric Variable

Because SEX is entered as alphanumeric data, this variable cannot be used in quantitative data analysis. Therefore, we want to convert it to numeric data.

1. View PASW Example in Data View.
2. Click on Transform, Recode...Into Different Variables.
3. In the left-side box, scroll to SEX, click on it, and click on the right-direction arrow next to this box. "SEX --> ?" will appear in the middle box.
4. In the right-side box "Output Variable: Name," type: SEXN (to refer to a numeric form of the variable SEX).
5. Click on "Change."
6. Click on "Old and New Values."
7. In "Old Value: Value," type: M.
8. In "New Value: Value," type: 1.
9. Check the box: "Convert numeric strings to numbers."
10. Click on Add.
11. In "Old Value: Value," type: F.
12. In "New Value: Value," type: 2.
13. The box: "Convert numeric strings to numbers," should still be checked.
14. Click on Add.
15. Click on Continue.
16. Click on Ok.
17. Click on the Variable View tab.
18. Click on the *Decimals* cell for SEXN and reduce the decimals to 0.
19. Click on the *Values* cell for SEXN and enter the appropriate values.
20. Click on the Data View tab.
21. Save PASW Example.

Creating Scales

We want to know the relative effects of perceived competence and confidence, age, sex, education, income, and illness on trust. To accomplish this task, we want to estimate the partial regression coefficients of COMPTNCE, CONFDNCE, AGE, SEX, EDUC, INCOME, and ILLNESS on TRUST (See: Figure 1). COMPTNCE, CONFDNCE, and TRUST are scales calculated from responses to their respective questions. Therefore, we want to create variables for these scales. We will calculate these scales as the average response to the appropriate questions for each scale.

1. View PASW Example in Data View.
2. Click on Transform, Compute Variable.
3. In the box *Target Variable*, type COMPTNCE (to refer to the scale for COMPTNCE).
4. In the box *Numeric Expression*, type: mean(COMP1, COMP2R, COMP3, COMP4).

- Note that we enter COMP2R instead of COMP2 so the coding for all four variables is in the same direction.
- PASW will show you how to enter formulas into the Numeric Expression box. For example, to learn how to calculate the mean: Scroll down and click on "Statistical" in the Function Group box. Click on "Mean" in the Functions and Special Variables box. Click on the top-facing arrow located next to the Function Group box and the formula for calculating a mean will appear in the Numeric Expression box.

5. With "mean(COMP1, COMP2R, COMP3, COMP4)" typed into the Numeric Expression box, click Ok.
6. Save PASW Example.
7. Repeat this procedure to calculate the scales CONFDNCE (i.e., this equals the mean of CONF1, CONF2, CONF3, and CONF4R) and TRUST (i.e., this equals the mean of TRUST1, TRUST2, and TRUST3R).
8. Click on Variable View. Note that decimals for each of the calculated scales equals 2. Leave this set to 2 because these variables were calculated as means of other variables.
9. In Variable View, note that COMPTNCE, CONFDNCE, and TRUST do not have entries in the Values column. For COMP1, where we already have value labels, right click the cell, and then click on "copy." Then, for COMPTNCE, CONFDNCE, and TRUST, right click and click on "paste."
10. Click on Data View.
11. Save PASW Example.

Segmenting the Data

In some cases, you might want to make changes to variables for some observations but not others or conduct analysis for some observations but not others. In these cases, you will need to select some observations in the data but not others. Suppose, for example, you want to conduct two separate regression analyses, one for males and one for females. To select just males:

1. View PASW Complete in Data View.
2. Click on Data: Select Cases.
3. Click the radio button: If Condition is Satisfied.
4. Click on "If"
5. Highlight SEXN and use the arrow key to transfer this variable to the right-side box.
6. Beside SEXN type " = 1" The result should be: SEXN = 1
7. Click on Continue.
8. Click on Ok.
9. The data set is now segmented. If you conduct regression analysis, it will be conducted just for males.

Step 3: Data Analysis

Open the file: PASW Complete. You can see that the variables and the first five rows of data are identical to the file you created called PASW Example. This file contains the complete set of 964 observations and is the one we will use for analysis. Therefore, PASW Example now can be closed.

Setup

In Data View for the file PASW Complete, click on Edit: Options. Then, click on the Output Labels tab. This box controls what is written on the output file from data analysis.

1. The box "Output Labeling: Variables in item labels shown as" contains the item "Names." This means that just the names of variables will be shown on the output tables as we conduct our analysis. Note that other options include "names and labels" and "labels." I suggest using just "Names" because output can appear highly cluttered if both names and labels are included on it.
2. The box "Output Labeling: Variable values in item labels shown as" contains the item "Values and Labels." This means that the value labels will appear on appropriate output from data analysis. I suggest using this option to make it easy to remember the value labels for variables shown on the output files.
3. The boxes for Pivot Table Labeling contain the same options as those for Output Labeling.

Frequencies

For each variable, examine its frequency distribution, mean, median, mode, standard deviation, skewness, and kurtosis.

1. View PASW Complete in Data View.
2. Click on Analyze: Descriptive Statistics: Frequencies.
3. In the left-side box click on COMP1.
4. Click and release the Shift key on your keyboard.
5. Scroll to SEXN and hold down the Shift key on your keyboard. Click on SEXN. The variables COMP1 to SEXN should be highlighted.
6. Click on the right-facing arrow in the center of the box to transfer the highlighted variables to the "Variables" box.
7. Click on Statistics.
8. Check: mean, median, mode, std. deviation, skewness, kurtosis.
9. Click on Continue.
10. Click Ok.
11. The output will appear in a separate window. This output can be printed or saved. For this exercise, click File: Close: No, which will return the PASW Complete file to Data View.

Descriptives

Examine the mean, standard deviation, and minimum and maximum values for each scale.

1. View PASW Complete in Data View.
2. Click on Analyze: Descriptive Statistics: Descriptives.
3. In the left-side box click on COMPTNCE.
4. Click and release the Shift key on your keyboard.
5. Scroll to TRUST and hold down the Shift key on your keyboard. Click on TRUST. The scales COMPTNCE, CONFDNCE, and TRUST should be highlighted.
6. Click on the right-facing arrow in the center of the box to transfer the highlighted scales to the "Variables" box.
7. Click on Options.
8. Check: mean, std. deviation, minimum, and maximum.
9. Click on Continue.
10. Click Ok.
11. The output will appear in a separate window. This output can be printed or saved. For this exercise, click File: Close: No, which will return the PASW Complete file to Data View.

Crosstabs

Examine crosstabulations to determine if nominal-level variables are independent of one another.

1. View PASW Complete in Data View.
2. Click on Analyze: Descriptive Statistics: Crosstabs
3. In the left-side box, click on SEXN.
4. Use the right-facing arrow beside "Rows" to transfer SEXN to the Rows box.
5. In the left-side box, click on ILLNESS.
6. Use the right-facing arrow beside "Columns" to transfer ILLNESS to the Columns box.
7. Click on Statistics.
8. Check: chi-square.
9. Click on Continue.
10. Click on Cells.
11. Check: row, column, and total (under "percentages").
12. Click on Continue.
13. Click Ok.
14. The output will appear in a separate window. This output can be printed or saved. For this exercise, click File: Close: No, which will return the PASW Complete file to Data View.

T-Test (Comparison of Two Groups)

Conduct a t-test to determine if continuous-level variables differ by the categories of a nominal-level variable, wherein the nominal level variable has two response categories.

1. View PASW Complete in Data View.
2. Click on Analyze: Compare Means: Independent Samples T-Test.
3. In the left-side box, click on SEXN.
4. Use the right-facing arrow beside "Grouping Variable" to transfer SEXN to that box (this is where you place the nominal-level variable).
5. Click on Define Groups.
6. In the box for Group 1, enter "1" (this is the first value for the nominal-level variable, which in this case refers to males).
7. In the box for Group 2, enter "2" (this is the second value for the nominal-level variable, which in this case refers to females).
8. Click on Continue.
9. In the left-side box, click on TRUST.
10. Use the right-facing arrow beside "Test Variable(s)" to transfer TRUST to the Test Variable(s) box. You can place more than one continuous-level variable in this box; PASW will conduct a separate t-test for each variable shown in the box.
11. Click Ok.
12. The output will appear in a separate window. This output can be printed or saved. For this exercise, click File: Close: No, which will return the PASW Complete file to Data View.

Analysis of Variance (ANOVA: Comparison of Multiple Groups)

Conduct analysis of variance to determine if continuous-level variables differ by the categories of a nominal-level variable, wherein the nominal level variable has more than two response categories.

1. View PASW Complete in Data View.
2. Click on Analyze: Compare Means: One-Way ANOVA.
3. In the left-side box, click on EDUC.
4. Use the right-facing arrow beside "Factor" to transfer EDUC to the Factor box (this is where you place the nominal-level variable; to keep this primer simple, please assume for this example that EDUC is a nominal-level variable).
5. In the left-side box, click on TRUST.
6. Use the right-facing arrow beside "Dependent List" to transfer TRUST to the Dependent List box. You can place more than one continuous-level variable in this box; PASW will conduct a separate ANOVA analysis for each variable shown in the box.
7. Click on Post-Hoc.
8. Check the box: Scheffe.
9. Click on Continue.
10. Click Ok.
11. The output will appear in a separate window. This output can be printed or saved. For this exercise, click File: Close: No, which will return the PASW Complete file to Data View.

Correlations

Conduct correlation analysis. This analysis includes a test of the statistical significance of each correlation.

1. View PASW Complete in Data View.
2. Click on Analyze: Correlation: Bivariate.
3. In the left-side box, in turn click on COMPTNCE, CONFDNCE, TRUST, AGE, SEXN, EDUC, INCOME, and ILLNESS.
4. For each variable in turn, click on the right-facing arrow in the center of the box to transfer the highlighted variable to the "Variables" box.
5. Click on Options.
6. If you want to view descriptive statistics and cross-product deviations, then check the appropriate boxes. Under Missing Values, you can select either "Exclude cases pairwise" (this is the default) or "Exclude cases listwise."
7. Click on Continue.
8. Click Ok.
9. The output will appear in a separate window. This output can be printed or saved. For this exercise, click File: Close: No, which will return the PASW Complete file to Data View.

Factor Analysis

When we created scales for COMPTNCE, CONFDNCE, and TRUST, we assumed the items we used to calculate these scales were measuring the same underlying construct (i.e., we assumed construct validity). Factor analysis provides a method to evaluate the construct validity of our scales. For each scale, we will conduct exploratory factor analysis to determine if the items used to calculate it measure a single "factor" (i.e., scale).

1. View PASW Complete in Data View.
2. Click on Analyze: Dimension Reduction: Factor.
3. In the left-side box, in turn click on COMP1, COMP2R, COMP3, and COMP4.
4. For each variable in turn, click on the right-facing arrow in the center of the box to transfer each item to the "Variables" box.
5. Click on Rotation and check the Varimax box.
6. Click on Continue.
7. Click Ok.
8. The output will appear in a separate window. Factor analysis shows the number of underlying factors for the variables COMP1, COMP2R, COMP3, and COMP4. For example, COMPTNCE has a single factor, which is what our theory said it would have.
9. Repeat this procedure for the items used to measure CONFDNCE.
10. Repeat this procedure for the items used to measure TRUST.
11. The outputs from factor analysis of CONFDNCE and TRUST can be printed or saved. For this exercise, click File: Close: No, for each one, which each time will return the PASW Complete file to Data View.

Reliability Analysis

When we created scales for COMPTNCE, CONFDNCE, and TRUST, we assumed the items we used to calculate these scales were measuring the scales with an acceptable degree of reliability (i.e., typically, we anticipate a Cronbach reliability estimate of .7 or greater).

1. View PASW Complete in Data View.
2. Click on Analyze: Scale: Reliability Analysis.
3. In the left-side box, in turn click on COMP1, COMP2R, COMP3, and COMP4.
4. For each variable in turn, click on the right-facing arrow in the center of the box to transfer each item to the "Variables" box.
5. Click on Statistics.
6. Beneath "Descriptives for," check: item, scale, scale if item deleted.
7. Click on Continue.
8. Click Ok.
9. The output will appear in a separate window. Cronbach's alpha will appear in the table labeled: Reliability Statistics.
10. Note the table labeled: Item-Total Statistics. The final column reads: Cronbach's alpha if item deleted. If this figure is substantially higher for any item, then it might be worthwhile to drop that item from the scale, depending upon considerations of content and construct validity.
11. Repeat this procedure for the items used to measure CONFDNCE.
12. Repeat this procedure for the items used to measure TRUST.
13. The outputs from reliability analysis of CONFDNCE and TRUST can be printed or saved. For this exercise, click File: Close: No, for each one, which each time will return the PASW Complete file to Data View.

Regression Analysis

We want to know the extent to which Trust is explained by perceived fairness in COMPTNCE and opportunities for Confidence, while statistically controlling for the social-demographic characteristics of age, sex, education, and income. We will make this assessment by examining the partial regression coefficients for the effects of the independent variables on the dependent variable: Trust. Also, we want to know the amount of variance explained in Trust. We will learn how well the model explains Trust by examining the R-Square value for the regression equation.

1. View PASW Complete in Data View.
2. Click on Analyze: Regression: Linear (Ordinary Least Squares Regression).
3. In the left-side box click on TRUST and use the arrow key to move this variable to the box labeled "Dependent."
4. In the left-side box, in turn click on COMPTNCE, CONFDNCE, AGE, SEXN, EDUC, INCOME, and ILLNESS and use the arrow key to move these variables to the box labeled "Independent."
5. Click on Ok.
6. The output will appear in a separate window. This output can be printed or saved. For this exercise, click File: Close: No, which will return the PASW Complete file to Data View.

Appendix A

Alternative Procedures for Recoding Variables

In Step 2.1 we recoded the responses to Q2 (COMP2), Q8 (CONF4), and Q11 (TRUST3) because these questions are worded in the opposite direction from the other questions. For example, Q1 (COMP1), Q3 (COMP3), and Q4 (COMP4) are worded such that the higher the response, the greater the perceived fairness of COMPTNCE. Q2 (COMP2), on the other hand, is worded such that the higher the response, the less the perceived fairness of COMPTNCE. To create a scale from the four questions, they must all be coded to reflect a single direction of perceived fairness in COMPTNCE. So, Q2 (COMP2) needed to be reverse coded.

Variables can be recoded using three different procedures. The choice of which one to use depends upon the number of variables needing to be recoded and the preferences of the researcher. Here are two alternative procedures for recoding other than the one described in Step 2.1.

Step 2.1.a

1. View PASW Complete in Data View.
2. Click on Transform: Recode: Into Same Variables.
3. In the left-side box, in turn highlight COMP2, CONF4, and TRUST3 and transfer these variables to the Variables box.
4. Click on "Old and New Values."
5. In the Old Value box, enter 10.
6. In the New Value box, enter 0.
7. Continue this procedure until all the values 10 to 0 have been recoded to 0 to 10.
8. Click Continue.
9. Click Ok.

This procedure might seem tedious in the sense that each value must be recoded. If one has many variables to recode, however, the procedure can save time overall. This procedure has the advantage of using the same variable names as are already entered into the data set. However, one must remember that variables have been recoded. If, for example, you set the data aside for a year before returning to it for further analysis, you might forget whether you have recoded.

Step 2.1.b

1. View PASW Complete in Data View.
2. Click on Transform: Recode: Into Different Variables.
3. In the left-side box, in turn highlight COMP2, CONF4, and TRUST3 and transfer these variables to the Variables box.
4. Highlight "COMP2 --> ?" in the Numeric Variable -> Output Variable box.
5. Enter "COMP2R" into the Output Variable, Name box and click: Change.
6. Highlight "CONF4 --> ?" in the Numeric Variable -> Output Variable box.
7. Enter "CONF4R" into the Output Variable, Name box and click: Change.
8. Highlight "TRUST3 --> ?" in the Numeric Variable -> Output Variable box.
9. Enter "TRUST3R" into the Output Variable, Name box and click: Change.
10. Click on "Old and New Values."
11. In the Old Value box, enter 10.
12. In the New Value box, enter 0.

13. Continue this procedure until all the values 10 to 0 have been recoded to 0 to 10.
14. Click Continue.
15. Click Ok.

This procedure might seem tedious in the sense that each value must be recoded. If one has many variables to recode, however, the procedure can save time overall. This procedure has the advantage over Step 2.1.a of using different variable names than those already being used in the data set.

Appendix B.

PASW Syntax

The procedures described in this primer have used PASW as a spreadsheet with pull-down menus. This approach is well suited to a primer, but is not the best way to use PASW. There are disadvantages to the spreadsheet approach. First, it is a slow and cumbersome approach for extensive data analysis. Second, the spreadsheet approach retains no permanent record of data management and analysis. Retaining a syntax record can help you recall the computations used to recode or create new variables. Third, a syntax record can be used again later to greatly simplify the data management and analysis process. For example, suppose we completed the steps outlined in this primer and then decided to add some additional observations that were returned late in the data collection process. We would have to repeat steps 2 and 3 completely to incorporate the new observations into the measures and analysis. If, on the other hand, we had used syntax to manage the data and conduct the analysis, after entering the new data we would simply re-run our syntax files to repeat the procedures conducted in steps 2 and 3.

The disadvantage of using syntax is that one has to learn it. Fortunately, PASW makes it easy to learn how to write syntax through its "paste" option.

Syntax for Step 2: Managing Data

Suppose that the data being used for this primer are entered into a PASW file named PASW Original. Recall from Step 2 that in the original data file COMP2, CONF4, and TRUST3 need to be reverse coded, SEX needs to be recoded as a numeric variable, and scales need to be created for COMPTNCE, CONFDNCE, and TRUST. By using the spreadsheet with its pull-down menus, we carried out these tasks through three procedures (i.e., see Step 2:1, Step 2:2, and Step 2:3). By writing syntax, we can accomplish all three of these tasks in a single procedure.

If we already know the rules for writing syntax in PASW, we can simply write the code we need and run it as a program. If we want to learn syntax, we can use a PASW manual that describes it for us. Because the "paste" option simplifies learning syntax, we will use that procedure.

1. To manage the variables in PASW Original, we first need to open it using syntax. To learn how to open PASW Original using syntax, open PASW Blank by clicking on its icon in the PASW Primer folder.
2. Click on File: Open: Data.
3. Enter: "PASW Original.sav" in the "File Name" box.
4. Do not click on Ok. Instead, click on Paste. A syntax file will open automatically; it will contain the syntax to open PASW Original.
5. Save this syntax file as: "Syntax Data Management" and leave this file open.
   - Note: The syntax for opening a file will be specific to your computer. If you wish to run your Syntax Data Management file on some other computer with PASW installed, then you must change the path information on the "GET FILE" statement at the top of the file.
6. Now that we have the code written in the syntax file to open PASW Original, open PASW Original by clicking on its icon in the PASW Primer folder. Close PASW Blank; it is no longer needed.
7. Next, we need to write syntax that will reverse the coding for COMP2, CONF4, and TRUST3. We will use the procedure described in Step 2.1.b (see: Appendix A), except we will not click Ok in the final step, instead we will click on "Paste."

a. In the Data View screen of PASW Original, click on Transform: Recode: Into Different Variables.
b. In the left-side box, in turn highlight COMP2, CONF4, and TRUST3 and transfer these variables to the Variables box.
c. Highlight "COMP2 --> ?" in the Numeric Variable -> Output Variable box.
d. Enter "COMP2R" into the Output Variable, Name box and click: Change.
e. Highlight "CONF4 --> ?" in the Numeric Variable -> Output Variable box.
f. Enter "CONF4R" into the Output Variable, Name box and click: Change.
g. Highlight "TRUST3 --> ?" in the Numeric Variable -> Output Variable box.
h. Enter "TRUST3R" into the Output Variable, Name box and click: Change.
i. Click on "Old and New Values."
j. In the Old Value box, enter 10.
k. In the New Value box, enter 0.
l. Continue this procedure until all the values 10 to 0 have been recoded to 0 to 10.
m. Click Continue.
n. Click Paste.

8. Open the syntax file. Note that the syntax for reversing the coding for COMP2, CONF4, and TRUST3, and creating the variables COMP2R, CONF4R, and TRUST3R has been added to the syntax file. Resave this syntax file as: Syntax Data Management.
9. We need to change SEX from an alphanumeric (i.e., string) variable to a numeric one. We will follow the procedure we used in Step 2.2, except in the final step we will click Paste instead of Ok.
    a. In the Data View screen of PASW Original, click on Transform, Recode...Into Different Variables.
    b. In the left-side box, scroll to SEX, click on it, and click on the right-direction arrow next to this box. "SEX --> ?" will appear in the middle box.
    c. In the right-side box "Output Variable: Name," type: SEXN (to refer to a numeric form of the variable SEX).
    d. Click on "Change."
    e. Click on "Old and New Values."
    f. In "Old Value: Value," type: M.
    g. In "New Value: Value," type: 1.
    h. Check the box: "Convert numeric strings to numbers."
    i. Click on Add.
    j. In "Old Value: Value," type: F.
    k. In "New Value: Value," type: 2.
    l. The box: "Convert numeric strings to numbers," should still be checked.
    m. Click on Add.
    n. Click on Continue.
    o. Click on Paste.
10. Open the syntax file. Note that the syntax for creating SEXN from SEX has been added to the syntax file. Resave this syntax file as: Syntax Data Management.
11. We want to create scales for COMPTNCE, CONFDNCE, and TRUST. We will follow the procedure used in Step 2.3, except in the final step we will click Paste instead of Ok.
    a. In the Data View screen of PASW Original, click on Transform, Compute Variable.
    b. In the box *Target Variable*, type COMPTNCE (to refer to the scale for COMPTNCE).
    c. In the box *Numeric Expression*, type "mean(COMP1, COMP2R, COMP3, COMP4)"
    d. Click Paste.

e. Repeat this procedure to calculate the scales CONFDNCE (i.e., this equals the mean of CONF1, CONF2, CONF3, and CONF4R) and TRUST (i.e., this equals the mean of TRUST1, TRUST2, and TRUST3R). Each time, click Paste instead of Ok.

12. Open the syntax file. Note that the syntax for creating COMPTNCE, CONFDNCE, and TRUST has been added to the syntax file. Resave this syntax file as: Syntax Data Management.
13. As a final step in preparing our data, we want to save the revised version of PASW Original.
    a. In the Data View screen of PASW Original, click: File: Save as.
    b. Enter: PASW Revised.
    c. Click Paste.
    d. Note: The syntax for saving a file will be specific to your computer.. Therefore, the syntax shown in the example files labeled Syntax Data Management will not work on your computer until you change the path information on the "SAVE OUTFILE" statement at the bottom of Syntax Data Management.
14. Open the syntax file. Note that the syntax for saving a revised PASW file (named PASW Revised) has been added to the syntax file. Resave this syntax file as: Syntax Data Management.
15. The file named Syntax Data Management is completed.
16. Close all PASW files and then open Syntax Data Management.
    a. Click Ctrl:A (to highlight all the text written in Syntax Data Management).
    b. Click on the right-facing arrow button at the top of the screen.
    c. The syntax file will complete all the needed transformations to PASW Original and create a new file named PASW Revised. This file will be identical to the one you created using the spreadsheet with pull-down menus in Step 2. You will want to click on Variable View to adjust the decimals for the new variables, add labels to them, and so on.

Syntax for Step 3: Analyzing Data

The file named PASW Revised is ready for data analysis (it is identical to PASW Complete). We need to write syntax for each procedure discussed in Step 3 above. We will learn the syntax for these procedures by using the "paste" option.

Frequencies

1. View PASW Revised in Data View.
2. Click on Analyze: Descriptive Statistics: Frequencies.
3. In the left-side box click on COMP1.
4. Click and release the Shift key on your keyboard.
5. Scroll to SEXN and hold down the Shift key on your keyboard. The variables COMP1 to SEXN should be highlighted.
6. Click Statistics.
7. Check: mean, median, mode, std. deviation, skewness, kurtosis and click on Continue.
8. Click Paste.
9. A syntax file will open automatically; it will contain the syntax to conduct analysis of frequencies for the data called PASW Revised.
10. Save this syntax file as: Syntax Data Analysis and leave this file open.

Descriptives

1. View PASW Revised in Data View.
2. Click on Analyze: Descriptive Statistics: Descriptives.
3. In the left-side box click on COMPTNCE.
4. Click and release the Shift key on your keyboard.
5. Scroll to TRUST and hold down the Shift key on your keyboard. The scales COMPTNCE, CONFDNCE, and TRUST should be highlighted.
6. Click on the right-facing arrow in the center of the box to transfer the highlighted scales to the "Variables" box.
7. Click on Options and check: mean, std. deviation, minimum, and maximum.
8. Click Continue.
9. Click Paste.
10. Open the syntax file. Note that the syntax for conducting descriptive statistics has been added to the syntax file. Resave this syntax file as: Syntax Data Analysis.

Crosstabs

1. View PASW Complete in Data View.
2. Click on Analyze: Descriptive Statistics: Crosstabs
3. In the left-side box, click on SEXN.
4. Use the right-facing arrow beside "Rows" to transfer SEXN to the Rows box.
5. In the left-side box, click on ILLNESS.
6. Use the right-facing arrow beside "Columns" to transfer ILLNESS to the Columns box.
7. Click on Statistics and check: chi-square.
8. Click Continue.
9. Click on Cells and check: row, column, total (under "percentages").
10. Click Paste.
11. Open the syntax file. Note that the syntax for conducting descriptive statistics has been added to the syntax file. Resave this syntax file as: Syntax Data Analysis.

T-Test (Comparison of Two Groups)

1. View PASW Complete in Data View.
2. Click on Analyze: Compare Means: Independent Samples T-Test.
3. In the left-side box, click on SEXN.
4. Use the right-facing arrow beside "Grouping Variable" to transfer SEXN to that box (this is where you place the nominal-level variable).
5. Click on Define Groups.
6. In the box for Group 1, enter "1" (this is the first value for the nominal-level variable, which in this case refers to males).
7. In the box for Group 2, enter "2" (this is the second value for the nominal-level variable, which in this case refers to females).
8. Click Continue.
9. In the left-side box, click on TRUST.
10. Use the right-facing arrow beside "Test Variable(s)" to transfer TRUST to the Test Variable(s) box. You can place more than one continuous-level variable in this box; PASW will conduct a separate t-test for each variable shown in the box.
11. Click Paste.
12. Open the syntax file. Note that the syntax for conducting descriptive statistics has been added to the syntax file. Resave this syntax file as: Syntax Data Analysis.

Analysis of Variance (ANOVA: Comparison of Multiple Groups)

1. View PASW Complete in Data View.
2. Click on Analyze: Compare Means: One-Way ANOVA.
3. In the left-side box, click on EDUC.
4. Use the right-facing arrow beside "Factor" to transfer EDUC to the Factor box (this is where you place the nominal-level variable; to keep this primer simple, please assume for this example that EDUC is a nominal-level variable).
5. In the left-side box, click on TRUST.
6. Use the right-facing arrow beside "Dependent List" to transfer TRUST to the Dependent List box. You can place more than one continuous-level variable in this box; PASW will conduct a separate ANOVA analysis for each variable shown in the box.
7. Click on Post-Hoc.
8. Check the box: Scheffe.
9. Click on Continue.
10. Click Paste.
12. Open the syntax file. Note that the syntax for conducting descriptive statistics has been added to the syntax file. Resave this syntax file as: Syntax Data Analysis.

Correlations

1. View PASW Revised in Data View.
2. Click on Analyze: Correlation: Bivariate.
3. In the left-side box, in turn click on COMPTNCE, CONFDNCE, TRUST, AGE, SEXN, EDUC, INCOME, and ILLNESS.
4. For each variable in turn, click on the right-facing arrow in the center of the box to transfer the highlighted variable to the "Variables" box.
5. Click on Options.
6. If you want to view descriptive statistics and cross-product deviations, then check the appropriate boxes. Under Missing Values, you can select either "Exclude cases pairwise" (this is the default) or "Exclude cases listwise." Click on Continue.
7. Click Paste.
8. Open the syntax file. Note that the syntax for calculating correlations has been added to the syntax file. Resave this syntax file as: Syntax Data Analysis.

Factor Analysis

1. View PASW Revised in Data View.
2. Click on Analyze: Dimension Reduction: Factor.
3. In the left-side box, in turn click on COMP1, COMP2R, COMP3, and COMP4.
4. For each variable in turn, click on the right-facing arrow in the center of the box to transfer each item to the "Variables" box.
5. Click on Rotation and ckeck the Varimax box.
6. Click on Continue.
7. Click Paste.
8. The syntax for conducting factor analysis on the COMPTNCE variables has been added to the syntax file.
9. Repeat this procedure for the items used to measure CONFDNCE.
10. Repeat this procedure for the items used to measure TRUST.
11. Open the syntax file. Note that the syntax for conducting factor analysis on the three scales has been added to the syntax file. Resave this syntax file as: Syntax Data Analysis.

Reliability Analysis

1. View PASW Revised in Data View.
2. Click on Analyze: Scale: Reliability Analysis.
3. In the left-side box, in turn click on COMP1, COMP2R, COMP3, and COMP4.
4. For each variable in turn, click on the right-facing arrow in the center of the box to transfer each item to the "Variables" box.
5. Click on Statistics.
6. Beneath Descriptives for, check: item, scale, scale if item deleted. Click on Continue.
7. Click Paste.
8. The syntax for conducting factor analysis on the COMPTNCE variables has been added to the syntax file.
9. Repeat this procedure for the items used to measure CONFDNCE.
10. Repeat this procedure for the items used to measure TRUST.
11. Open the syntax file. Note that the syntax for conducting reliability analysis on the three scales has been added to the syntax file. Resave this syntax file as: Syntax Data Analysis.

Regression Analysis

1. View PASW Revised in Data View.
2. Click on Analyze: Regression: Linear (Ordinary Least Squares Regression).
3. In the left-side box click on TRUST and use the arrow key to move this variable to the box labeled "Dependent."
4. In the left-side box, in turn click on COMPTNCE, CONFDNCE, AGE, SEXN, EDUC, INCOME, and ILLNESS and use the arrow key to move these variables to the box labeled "Independent."
5. Click on Paste.
6. Open the syntax file. Note that the syntax for conducting regression analysis has been added to the syntax file. Resave this syntax file as: Syntax Data Analysis.

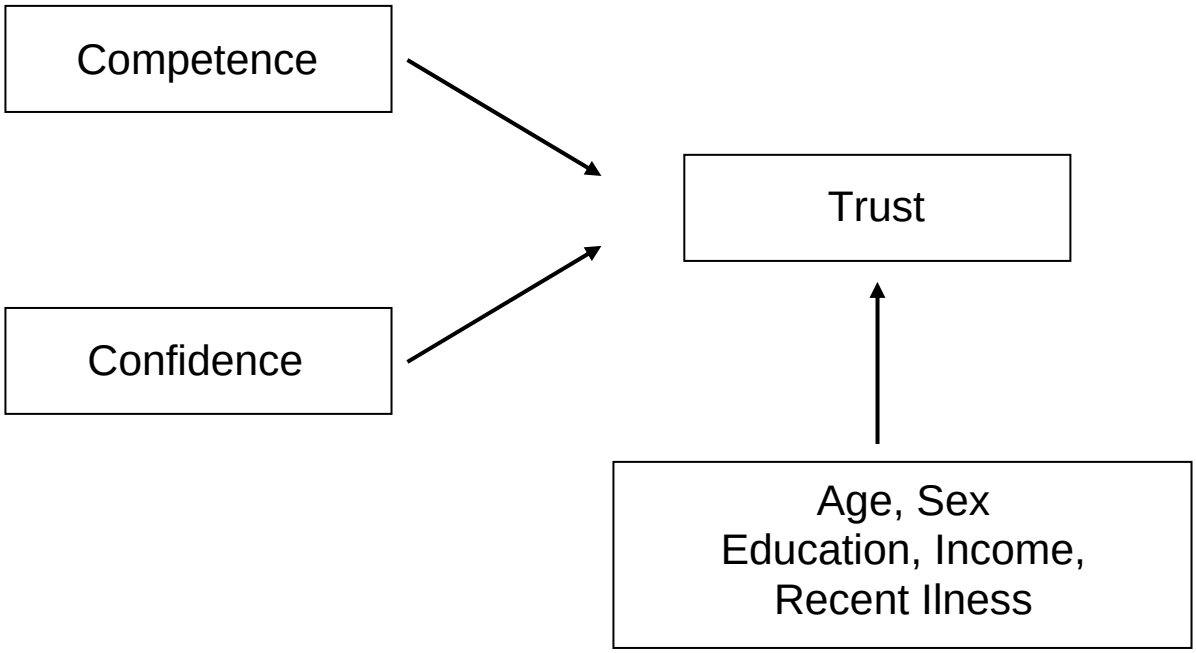
Data Analysis Using Syntax

1. View PASW Revised in Data View.
2. If it is not already open, open the Syntax Data Analysis file.
3. Click Crtl:A to highlight all the text in the Syntax Data Analysis file.
4. Click on the right-facing arrow button at the top of the screen.
5. All the data analysis conducted in Step 3 will be conducted in a single run.
6. The output will appear in a separate window. This output can be printed or saved. For this exercise, click File: Close: No, which will return the file to Data View.

Notes on Using Syntax

It might seem like using syntax involves much more work than using PASW as a spreadsheet with pull-down menus. Recognize first that building a syntax file involves just the extra step of clicking on Paste prior to clicking on Ok for each step of data management and analysis. Recognize secondly, that using syntax can save you much time and effort in the long run. Consider this example: Suppose that after your analysis is completed you decide (or others request of you) that Q7, used to measure CONF3, be removed from the CONFDNCE scale because it does not have the level of content validity that you (or others) prefer. To make this change using pull-down menus on the spreadsheet, you have to repeat the procedure for creating CONFDNCE, this time omitting CONF3. Then, you have to

conduct most of your data analysis again. If you have created syntax files and saved them, however, you need only delete CONF3 from the line in the syntax file used to create CONFDNCE, re-run Syntax Data Management to create a new version of PASW Revised, and then re-run the Syntax Data Analysis file. Thus, for the overall process of working with data and conducting ongoing research, using syntax saves you time. Also, creating and saving syntax files provides you with a permanent record of data transformations, transformations you might forget about when you return to the data set at a later time.



Graphic Depicting A Theoretical Model of
Consumer Trust in Food Processing Companies

Example Questionnaire

These questions appeared on a 2008 nationwide survey regarding consumer trust in the U.S. food system. The respondents were adults aged 18-64.

Opinions

The questions shown below were introduced as:

"Please circle a number that best describes your agreement or disagreement with the following statements about food processing companies."

Each statement had 11 response categories, anchored with 0 = Strongly Disagree and 10 = Strongly Agree.

1. Food processing companies have the skills to produce safe food.
2. Food processing companies need more training to produce safe food.
3. Food processing companies have the experience needed to produce safe food.
4. Food processing companies have the knowledge needed to produce safe food.
5. I believe that food processing companies have the integrity to produce safe food.
6. I believe that food processing companies want to do the right thing to make food safe to eat.
7. I believe that food processing companies are honest about keeping food safe to eat.
8. I believe that food processing companies are willing to sacrifice food safety to save money.
9. I trust food processing companies to produce safe food.
10. I believe that I can trust food processing companies to keep food safe.
11. I do not trust food processing companies to do what is needed to keep food safe.

Background Information

12. Please circle the number for the category that describes your age on your most recent birthday.

    (1) Less than 21
    (2) 21 to 25
    (3) 26 to 34
    (4) 35 to 44
    (5) 45 to 54
    (6) 55 to 64
    (7) 65 or older

13. What is your sex? Circle Male or Female.

    Male Female

14. Circle the number of the category that best describes the highest level of education you have completed.

    (1) Less than high school
    (2) High school
    (3) Vocational or technical school
    (4) Undergraduate college degree
    (5) Master's degree
    (6) PhD or other doctorate degree

15. Circle the number of the category that describes your total household income before taxes in 2007.

    (1) Less than $25,000
    (2) $25,000 to $49,999
    (3) $50,000 to $74,999
    (4) $75,000 to $99,999
    (5) $100,000 or more.

16. Circle a number to indicate whether you have become ill from eating any type of processed food within the past 12 months.

    (1) Yes.
    (2) No.