

Introduction to IBM SPSS

Pawel Skuza
Statistical Consultant
eResearch@Flinders / Central Library



Pawel Skuza 2013

- Please note that the workshop is aimed to be a brief introduction to the topic and this PowerPoint is primarily designed to support the flow of the workshop. It cannot be seen as either an exclusive or exhaustive resource on the statistical concepts which are introduced in this course. You are encouraged to refer to peer-reviewed books or papers that are listed throughout the presentation.
- It is acknowledged that a limited number of slides have been adapted from presentations produced by the previous statistical consultant (Kylie Lange) and a colleague with whom I worked with in the past (Dr Kelvin Gregory).



Pawel Skuza 2013

Statistical Consulting Website

<http://www.flinders.edu.au/library/research/erestatics-consulting/>

or go to Flinders University Website
→A-Z
Index →S
→Statistical Consultant



Introductory Level

- Introduction to IBM SPSS
- Introduction to Statistical Analysis

IBM SPSS - Intermediate Level

- Understanding Your Data (Descriptive Statistics, Graphs and Custom Tables)
 - Correlation and Multiple Regression
 - Logistic Regression and Survival Analysis
 - Basic Statistical Techniques for Difference Questions
 - Advanced Statistical Techniques for Difference Questions
 - Longitudinal Data Analysis - Repeated Measures ANOVA
 - Categorical Data Analysis

IBM SPSS - Advanced Level

- Structural Equation Modelling using Amos
- Linear Mixed Models
 - Longitudinal Data Analysis - Mixed and Latent Variable Growth Curve Models
- Scale Development
- Complex Sample Survey Design / ABS and FaHCSIA Confidentialised Datasets

POWER SKILLS 2013

??? SPSS / PASW / IBM SPSS ???

- In late 2009 SPSS Inc. was taken over by IBM Company and the software changed its official name twice over the period of one year. From SPSS it was relabelled to PASW (Predictive Analytics Software) and later to IBM SPSS. Consequently, there may be books, online resources, etc. that use either of those different names but in fact refer to the same software.
- **SPSS**
 - Statistical Package for the Social Sciences
- **PASW**
 - Predictive Analytics Software
- **IBM SPSS Statistics**

SPSS / PASW / IBM SPSS

(1) How to check?

START SOFTWARE →
HELP → ABOUT

(2) How to cite?

(Examples with APA Style)

- SPSS Inc. Released 2007. SPSS for Windows, Version 16.0. Chicago: SPSS Inc.
- SPSS Inc. Released 2008. SPSS Statistics for Windows, Version 17.0. Chicago: SPSS Inc.
- SPSS Inc. Released 2009. PASW Statistics for Windows, Version 18.0. Chicago: SPSS Inc.
- IBM Corp. Released 2010. IBM SPSS Statistics for Windows, Version 19.0. Armonk, NY: IBM Corp.
- IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.
- IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.



Pawel Skuza 2013

IBM SPSS on Flinders University

- Flinders University has licence for number of IBM SPSS products (versions 19, 20, 21) covering following modules:
 - IBM SPSS Statistics Base
 - IBM SPSS Regression
 - IBM SPSS Advanced Statistics
 - IBM SPSS Complex Samples
 - IBM SPSS Categories
 - IBM SPSS Exact Tests
 - IBM SPSS Missing Values
 - IBM SPSS Forecasting
 - IBM SPSS Custom Tables
 - IBM SPSS Conjoint
 - IBM SPSS Statistics Programmability Extension and AMOS
- For details explaining various modes of obtaining access to the software go to

<http://www.flinders.edu.au/library/research/eresearch/statistics-consulting/spss-licenses-and-technical-support/licenses-for-university-and-home.cfm>

Data used

(1) Two data sets describing the survival status of individual passengers on the Titanic are used. More information about them can be found in here:

<http://lib.stat.cmu.edu/S/Harrell/data/descriptions/titanic.html>

(2) Openly available simplified data from PISA 2003 Study

(The **P**rogramme for **I**nternational **S**tudents **A**ssessment)

<http://www.pisa.oecd.org>

- SPSS has three “Windows” that we will use
 - Data Editor
 - In this view you can enter data and change the characteristics of variables
 - You can now have multiple datasets open at once
 - Syntax Editor
 - In this view you can write and run commands that will perform various statistical procedures
 - Output Viewer
 - And in this view you will see the results of the statistical procedures that you have performed

Exercise 1

- Entering data into SPSS

Few definitions

- **Variable**
 - Any characteristic or attribute of persons, objects, or events that can take on different numerical values
- **Observation**
 - Is a record or notation made from observing a phenomenon
- **Datum**
 - A single observation
- **Data**
 - May be measurements or observations of a variable
- **Case**
 - Typically a person being studied

Enter the Variable Details

- Variables names
 - Name must begin with a letter
 - Remaining characters can be any letter, and digit, a period, or the symbols @, #, _, \$
 - BUT make the name meaningful
 - Variable names cannot end with a period (.)
 - Avoid ending the name with an underscore (_)
 - Cannot be one of the reserved key words
 - ALL, AND, BY, EQ, GT, LE, LT, NE, NOT, OR, TO WITH
 - Can be a mixture of upper and lowercases
 - But best to use all lowercases
 - Can be long
 - But best to keep to 8 characters long

Variable View

- Type: numeric, string, date, currency, ...
- Width: variable width; can also be set through Type
- Decimals: number of decimal places displayed in the Data View
- Label: 256 character description of the variable; used in output tables and charts

Variable View

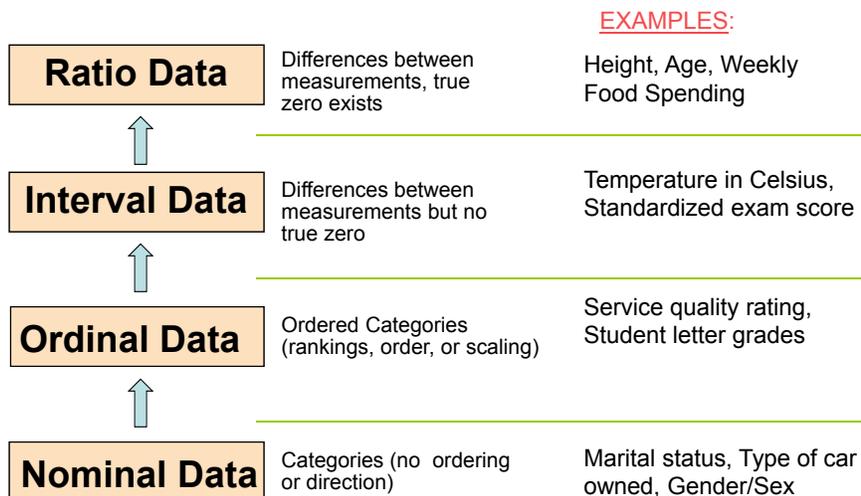
- Values: coding scheme used (eg, 1=Male, 2=Female, 9=Unknown)
- Missing: code(s) used to denote a missing response (eg, 9, 99, -1)
- Columns: width of column in Data View
- Align: alignment of data in Data View
- Measure: measurement level (Scale, Ordinal, Nominal)

Types of Data

Many different ways of classifying data

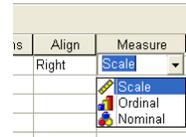
- **Categorical or discrete data**
 - When data are classified into exclusive categories
 - For example, male or female
- **Categorized data**
 - When a categorical data is thought to have an underlying distribution
 - Student responses to a test (wrong or right) have an underlying distribution of proficiency (or ability)
- **Numerical data**
 - Discrete
 - There are gaps between the numbers
 - Continuous
 - There are no gaps between the numbers

Levels of Measurement and Measurement Scales



Specify the Measurement Type

- Typically you will have ordinal or nominal
 - Nominal
 - Numbers do not carry any real meaning
 - Ordinal
 - Numbers carry rank meanings only
 - Scale
 - Fractional values make sense



For more information refer for example to Garson, G. D. (2012). *Measurement Levels*. Asheboro, NC: Statistical Associates Publishers. available online: <http://www.statisticalassociates.com/measurement.htm>

3

- Use “Save file as” option

Example:

Data_2008_08_19,

Data_2008_08_20

Output_2008_08_19

Output_2008_08_20

Exercise 2

- Importing data into SPSS

Exercise 3

- Sort Cases / Select Cases / Split file

Exporting output

- Graphs
 - Copy and Paste into standard apps (eg: Word, PowerPoint)
 - File > Export to save as a picture format file (eg: jpeg, bitmap)
- Tables
 - Word: Edit > Paste Special to paste as Word Table (default), plain text or picture
 - PowerPoint: Edit > Paste Special to paste as picture (default) or formatted text

Recoding

- Sometimes you want to change the values of an existing variable
 - Recode the variable into itself
 - Replaces old values with new values
 - Recode the variable into a new variable
 - Typically do this
 - Unless you want to make the change permanent

Data manipulation

- Compute
 - Transform > Compute
 - Create new variable according to a formula
 - Doesn't update automatically for any new cases or changed data
 - Can use "Use Expression As Label" option to record the formula used
 - Take care with missing values

Exercise 4

- Data transformation

Time permitting

Additional Exercises 5 & 6

- Using syntax for data preparation
- Merging files



Pawel Skuza 2013

SPSS – BOOKS (Hard copies)

* First Choice

- Chapters 1 & 2 in Allen, Peter James, & Bennett, Kellie. (2012). *SPSS statistics : a practical guide : version 20*. South Melbourne, Vic.: Cengage Learning Australia.
- Chapters 1, 2, 28 in Argyrous, George. (2011). *Statistics for research : with a guide to SPSS (3rd ed.)*. Los Angeles: Sage.
- Chapter 1 in Landau, Sabine, & Everitt, Brian. (2004). *A handbook of statistical analyses using SPSS*. Boca Raton: Chapman & Hall/CRC.
- *Chapters 2 & 3 in Kinnear, Paul R., & Gray, Colin D. (2009). *PASW statistics 17 made simple (replaces SPSS statistics 17)*. London ; New York: Psychology Press.
- Chapter 3 in Field, Andy P. (2009). *Discovering statistics using SPSS : (and sex, drugs and rock 'n' roll) (3rd ed.)*. Los Angeles: SAGE Publications.
- Chapters 2,3 - Norušis, M. J. (2008). *SPSS 16.0 [or later versions] Guide to Data Analysis*. Upper Saddle River, NJ: Prentice Hall.

SPSS – BOOKS (Online copies)

* First Choice

Hard copies and online versions

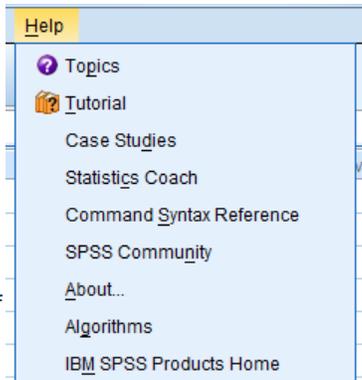
- * Chapters 2-4 & 8 in Pallant, Julie. (2010). *SPSS survival manual a step by step guide to data analysis using SPSS* (4th ed.). Maidenhead: Open University Press/McGraw-Hill.
- * Chapters 2, 3 & 5 in Morgan, George A. (2011). *IBM SPSS for introductory statistics : use and interpretation* (4th ed.). New York: Routledge.

Online versions

- Chapters 2 & 3 in Bryman, Alan, & Cramer, Duncan. (2011). *Quantitative data analysis with IBM SPSS 17, 18 & 19 : a guide for social scientists*. Hove ; New York: Routledge.
- Chapters 2 & 3 in Morgan, George A. (2011). *IBM SPSS for introductory statistics : use and interpretation* (4th ed.). New York: Routledge.
- Chapters 1 & 2 in Marston, Louise. (2010). *Introductory statistics for health and nursing using SPSS*. Los Angeles: SAGE.
- Chapter 1 in Larson-Hall, Jenifer. (2010). *A guide to doing statistics in second language research using SPSS*

SPSS – Help and Resources

- SPSS has a range of help options available
 - Topics
 - Used to find specific information
 - Tutorial
 - Find illustrated, step-by-step instructions for the basic features
 - Case studies
 - Hands-on examples of various types of statistical procedures
 - Statistics coach
 - To help you find the procedure you want to use



And manuals available online -

<http://www-01.ibm.com/support/docview.wss?uid=swg27021213>

Pawel Skuza 2013

SPSS – Online tutorials and resources

(!!! Please keep in mind that usually online resources are not academically peer reviewed. Despite many of them being of high quality as well as being very useful from educational point of view, they shouldn't be treated as a completely reliable and academically sound references)

- **Statnotes: Topics in Multivariate Analysis, by G. David Garson**
<http://www.statisticalassociates.com/>
- **UCLA Institute for Digital Research and Education - SPSS Starter Kit**
<http://www.ats.ucla.edu/stat/spss/sk/default.htm>
- **Getting Started with SPSS for Windows by John Samuel, Indiana University**
<http://www.indiana.edu/~statmath/stat/spss/win/index.html>
- **Companion Website for the 3rd edition of Discovering Statistics Using SPSS by Andy Field**
<http://www.uk.sagepub.com/field3e/SPSSFlashmovieslect.htm>
- **SPSS for Windows and Amos tutorials by Information Technology Services, University of Texas**
<http://ssc.utexas.edu/software/software-tutorials#SPSS>
- **Journey in Survey Research by John Hall**
<http://surveyresearch.weebly.com/index.html>

SPSS – Help and Resources

• Online SPSS FORUMS

(!!! Please keep in mind that usually online resources are not academically peer reviewed. Despite many of them being of high quality as well as being very useful from educational point of view, they shouldn't be treated as a completely reliable and academically sound references.

!!! Suggestions / Guidance found on forums should be especially treated very doubtfully, yet they may point to more reliable academic resources and be somewhat of help.

Archives of SPSSX-L@LISTSERV.UGA.EDU – List Serve that is endorsed by IBM SPSS
<http://www.listserv.uga.edu/archives/spssx-l.html>

Other forums

<http://groups.google.com/group/comp.soft-sys.stat.spss/topics?gvc=2>
<http://www.spssforum.com/>

THANK YOU

Please provide us with your feedback by completing the short survey.



Pawel Skuza 2013