Mohamed Khider University, Biskra, Faculty of Architecture, Civil Engineering, Hydraulics
Department of Architecture

Master 2 in **Construction Projects Management**
Course: **Data Analysis**

05 04 03 02 01 About course

CHAPTER 04

Data Analysis: Exploitation of the Data Collected

Part 02

Dr. Bendjedidi Souhaila



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Analyzing Quantitative Data with SPSS (Introduction to SPSS)

1. Overview of SPSS

1-1-What is SPSS?

SPSS (Statistical Package for the Social Sciences) is a software program used by researchers in various disciplines for quantitative analysis of complex data

It is developed by **Norman H. Nie** and C. **Hadli Hull** of IBM Corporation in the year **1968**. It is compatible with Windows, Linux and Mac operation systems. SPSS is among the most widely used programs for statistical analysis

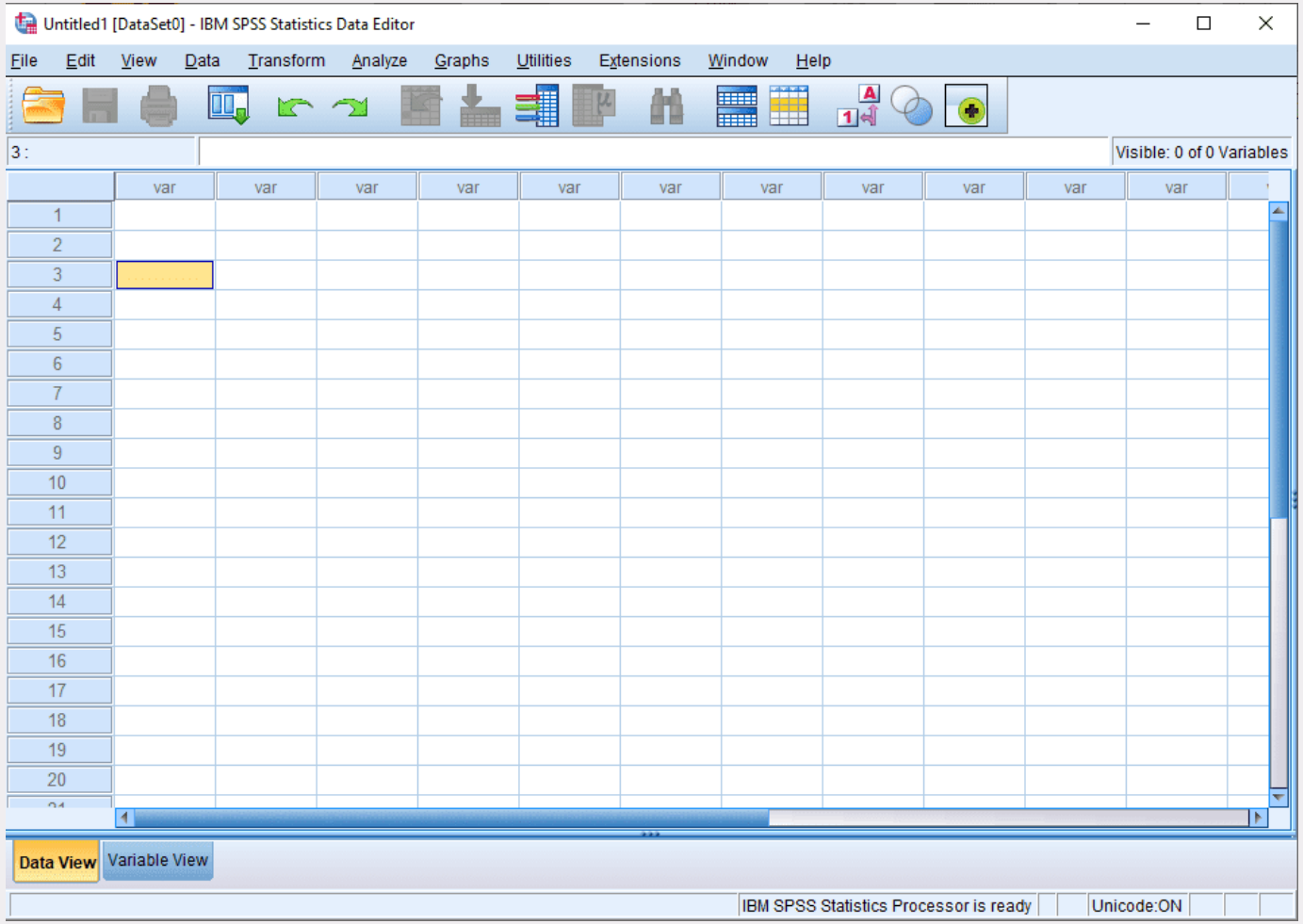
1. Overview of SPSS

1-2-Why use SPSS for quantitative data analysis?

- **User-Friendly**: Easy interface with no coding required.
- **Powerful Tools**: Supports diverse statistical analyses and visualizations.
- **Efficient**: Simplifies data management and saves time.
- **Reliable**: Accurate results for large datasets.

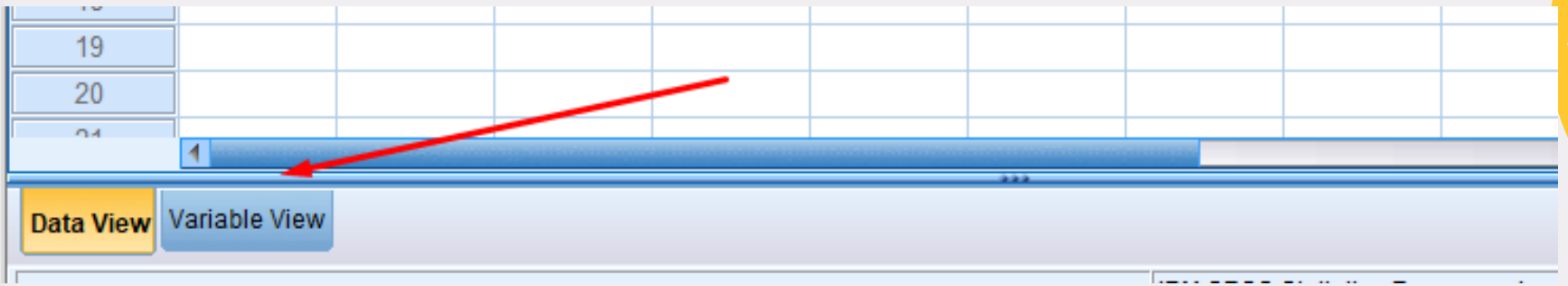
2.The SPSS interface

The main interface of SPSS is called the **Data Editor window**. This is where most of the operations in SPSS take place, from creating variables to transforming the data and choosing analyses.



2.The SPSS interface

The data editor window is composed of **2 tabs**; **the data view** and **the variable view**. The tabs used to switch between these views are located at the bottom-left of the window.



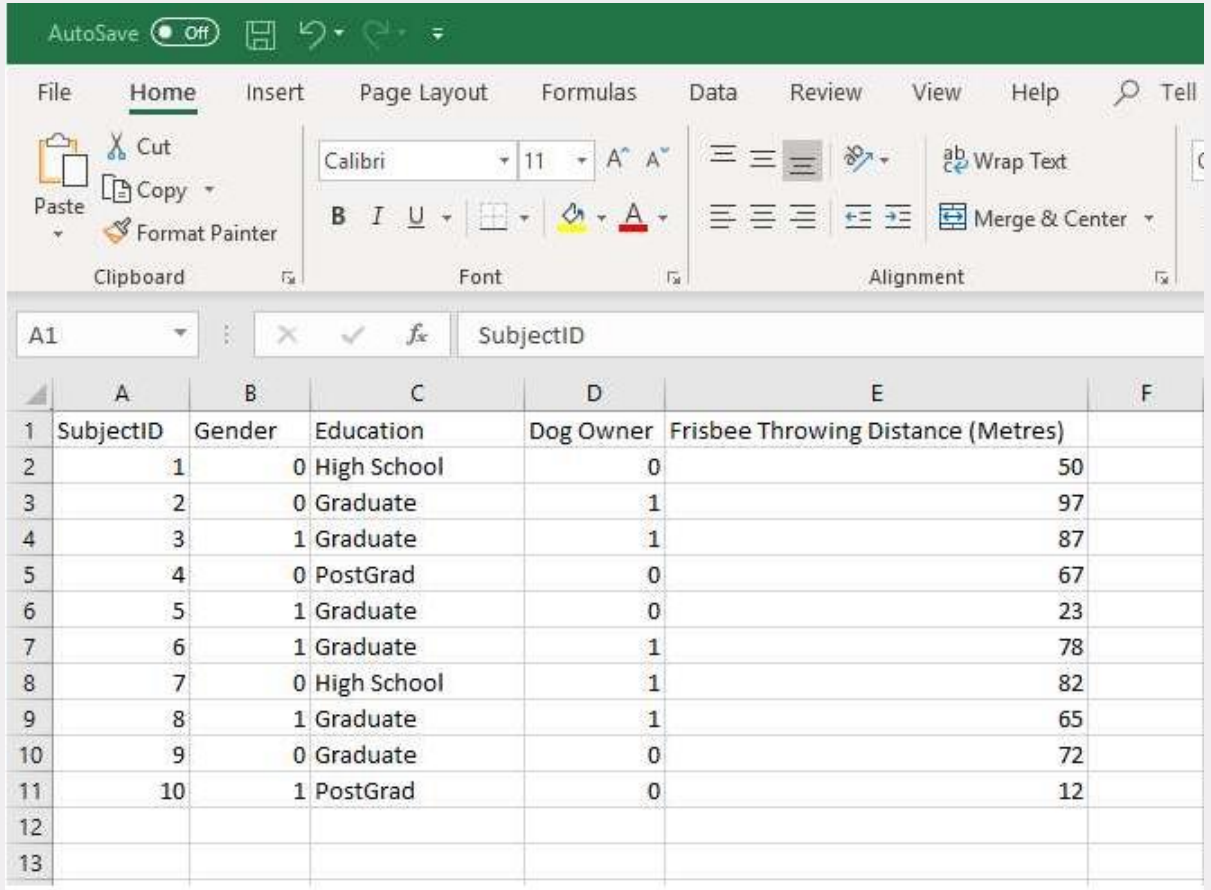
The data view is where you can view and edit the data.

The variable view is where you can define and edit the variables.

03 Step-by-Step SPSS Data Analysis Process

Step 1: Prepare Your Data

Ensure that the data is collected and organized in a clear format, such as an Excel spreadsheet, with all necessary variables and values in tabular form.



	A	B	C	D	E	F
1	SubjectID	Gender	Education	Dog Owner	Frisbee Throwing Distance (Metres)	
2	1	0	High School	0	50	
3	2	0	Graduate	1	97	
4	3	1	Graduate	1	87	
5	4	0	PostGrad	0	67	
6	5	1	Graduate	0	23	
7	6	1	Graduate	1	78	
8	7	0	High School	1	82	
9	8	1	Graduate	1	65	
10	9	0	Graduate	0	72	
11	10	1	PostGrad	0	12	
12						
13						

03 Step-by-Step SPSS Data Analysis Process

Step 2: Getting data into SPSS

There are multiple ways to bring data into SPSS. In this lesson, I will demonstrate how to define variables, enter data manually, and import data from Excel into SPSS.

A/- Entering Data Manually

A/1- Defining Variables in SPSS

Defining variables in SPSS is an important step to ensure your data is properly organized and ready for analysis. Each column in the SPSS Data View represents a variable, and defining these variables involves specifying details about their names, types, and properties.

To define variables in SPSS, switch to the Variable View in the Data Editor. Here, you specify characteristics such as:

03 Step-by-Step SPSS Data Analysis Process

- **Variable Name**

Each variable must have a unique name. The name should begin with a letter and cannot contain spaces or special characters (e.g., "Age" or "Income").

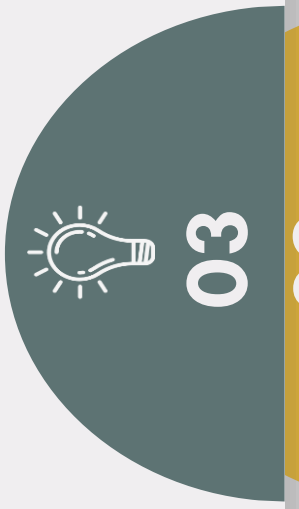
- **Variable Type**

In the "Type" column, choose the type of data your variable contains. Common types include:

1. **Numeric**: For numbers (e.g., age, income).
2. **String**: For text (e.g., names, categories).

- **Adding Labels:**

Use the "Label" column to provide a detailed description of the variable. For example, instead of just "Age," the label might be "Respondent's Age in Years."

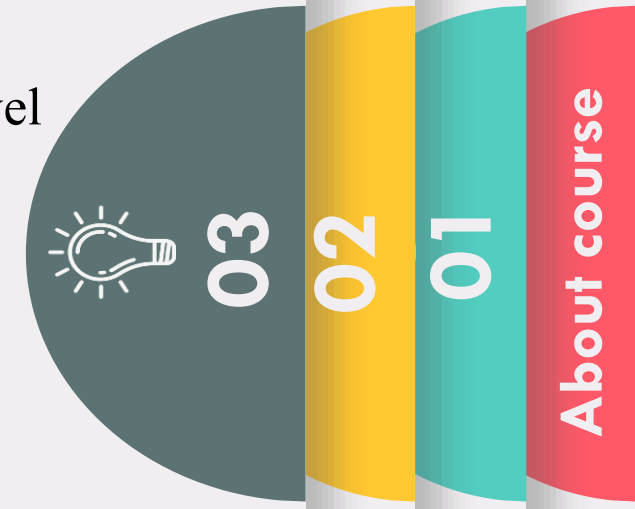


03 Step-by-Step SPSS Data Analysis Process

- **Defining Value Labels (Optional):**

  For categorical data (e.g., gender or education level), you can assign labels to specific values using the "Values" column. For example: 1 = Male, 2 = Female

- **Specifying Measurement Levels:** In the "Measure" column, select the variable's level of measurement:
  - Nominal: For categories without order (e.g., gender, color).
  - Ordinal: For categories with a logical order (e.g., education levels).
  - Scale: For numeric data with meaningful intervals (e.g., height, income).
- **Adjusting Other Properties:**
  - Width: Specifies the number of characters or digits the variable can hold.
  - Decimals: Sets the number of decimal places for numeric variables.



03 Step-by-Step SPSS Data Analysis Process

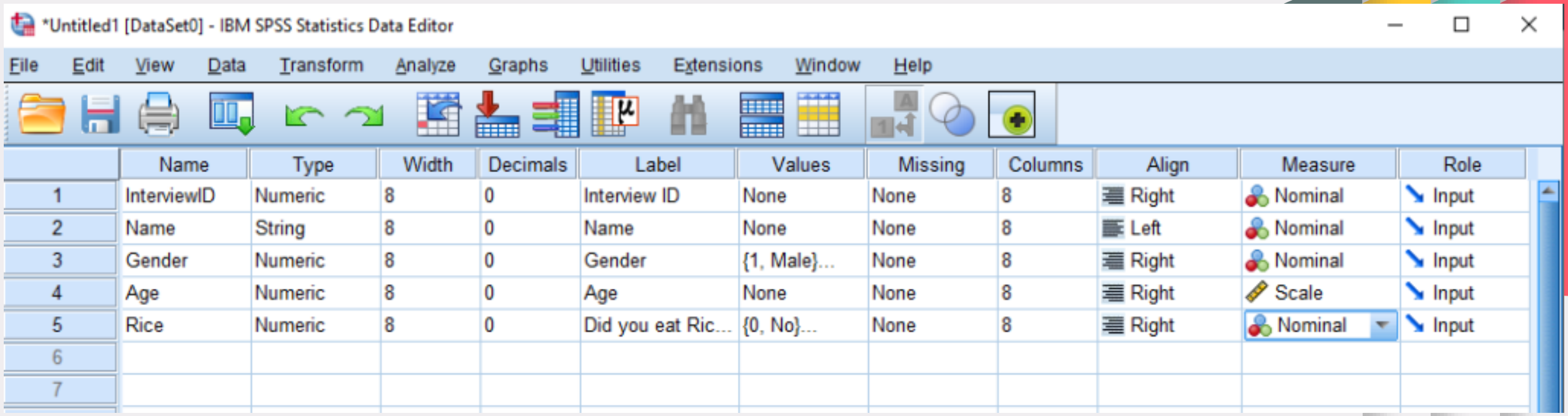
Example:

Name	Type	Decimals	Label	Values	Measure
Name	String	0	Name		Nominal
Gender	Numeric	0	Gender	1 – Male 2 – Female	Nominal
Age	Numeric	0	Age		Scale
Rice	Numeric	0	Did you eat Rice in the past 7 days?	1 – Yes 0 – No	Nominal

03 Step-by-Step SPSS Data Analysis Process

Example:

The Variable view will look like this:



	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	InterviewID	Numeric	8	0	Interview ID	None	None	8	Right	Nominal	Input
2	Name	String	8	0	Name	None	None	8	Left	Nominal	Input
3	Gender	Numeric	8	0	Gender	{1, Male}...	None	8	Right	Nominal	Input
4	Age	Numeric	8	0	Age	None	None	8	Right	Scale	Input
5	Rice	Numeric	8	0	Did you eat Ric...	{0, No}...	None	8	Right	Nominal	Input
6											
7											

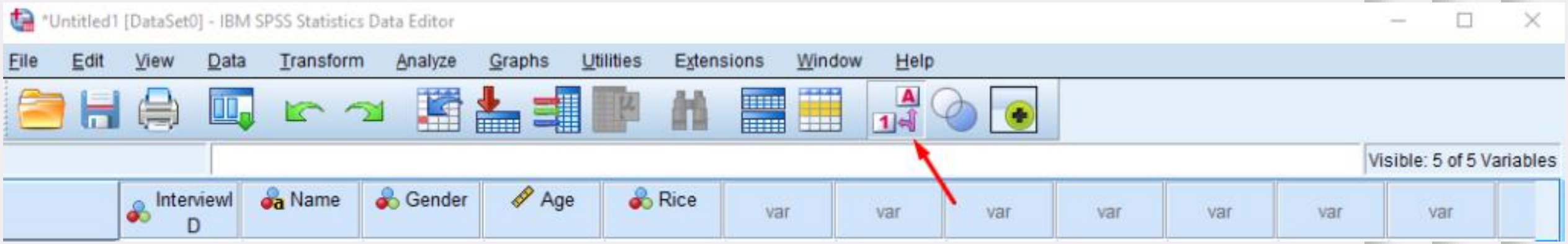
03 Step-by-Step SPSS Data Analysis Process

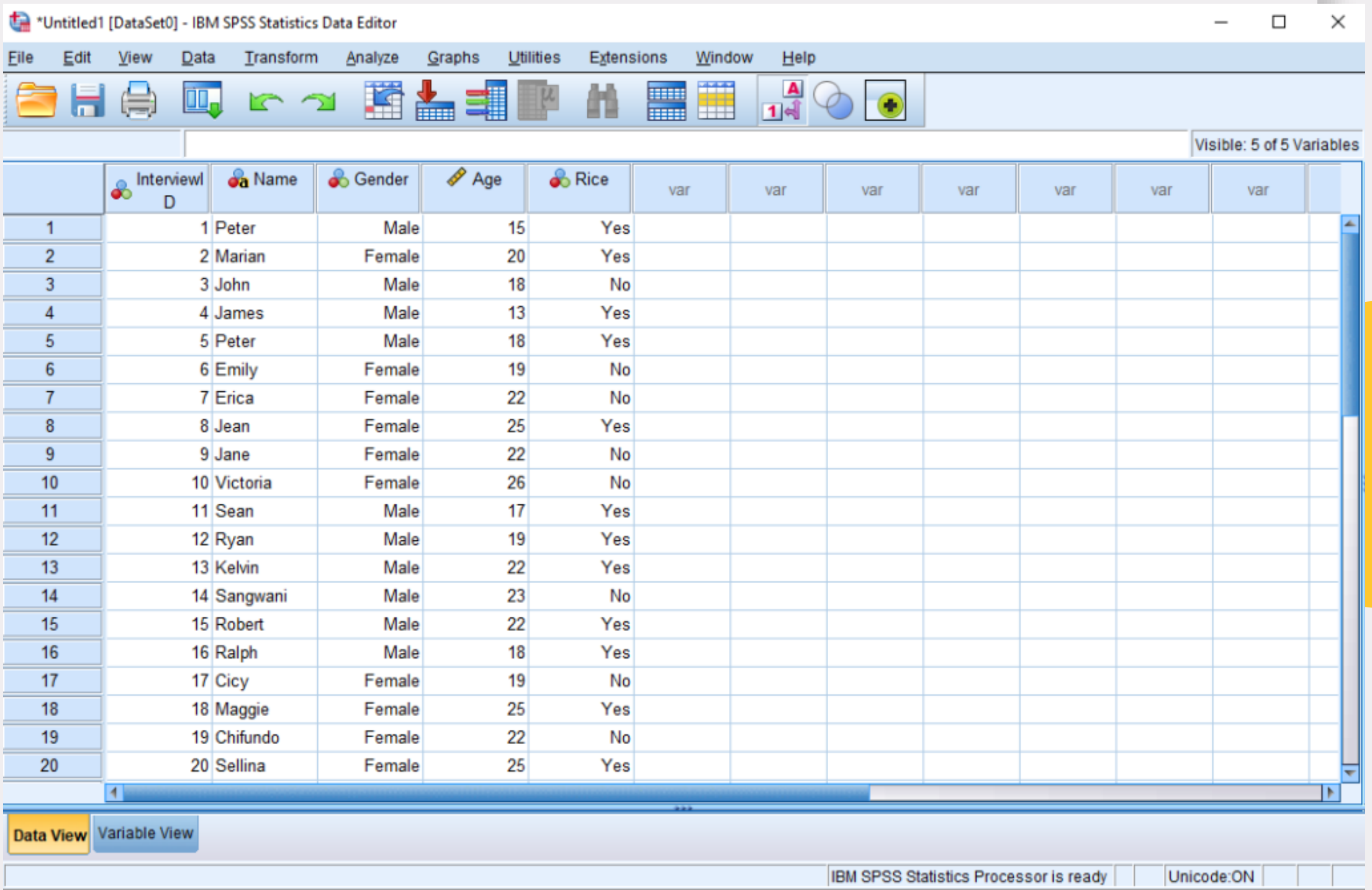
A/2- Data Entry in SPSS

Entering data in SPSS is simple and works like Excel:

1. **Go to Data View**: Click the "Data View" tab at the bottom-left of the screen.
2. **Enter Data**: Type values directly into the cells (e.g., type "1" in the Gender column).
3. **Show Labels**: Click the "Value Labels" button on the toolbar to display labels like "Male" instead of "1."

This makes data entry and viewing easier to understand.

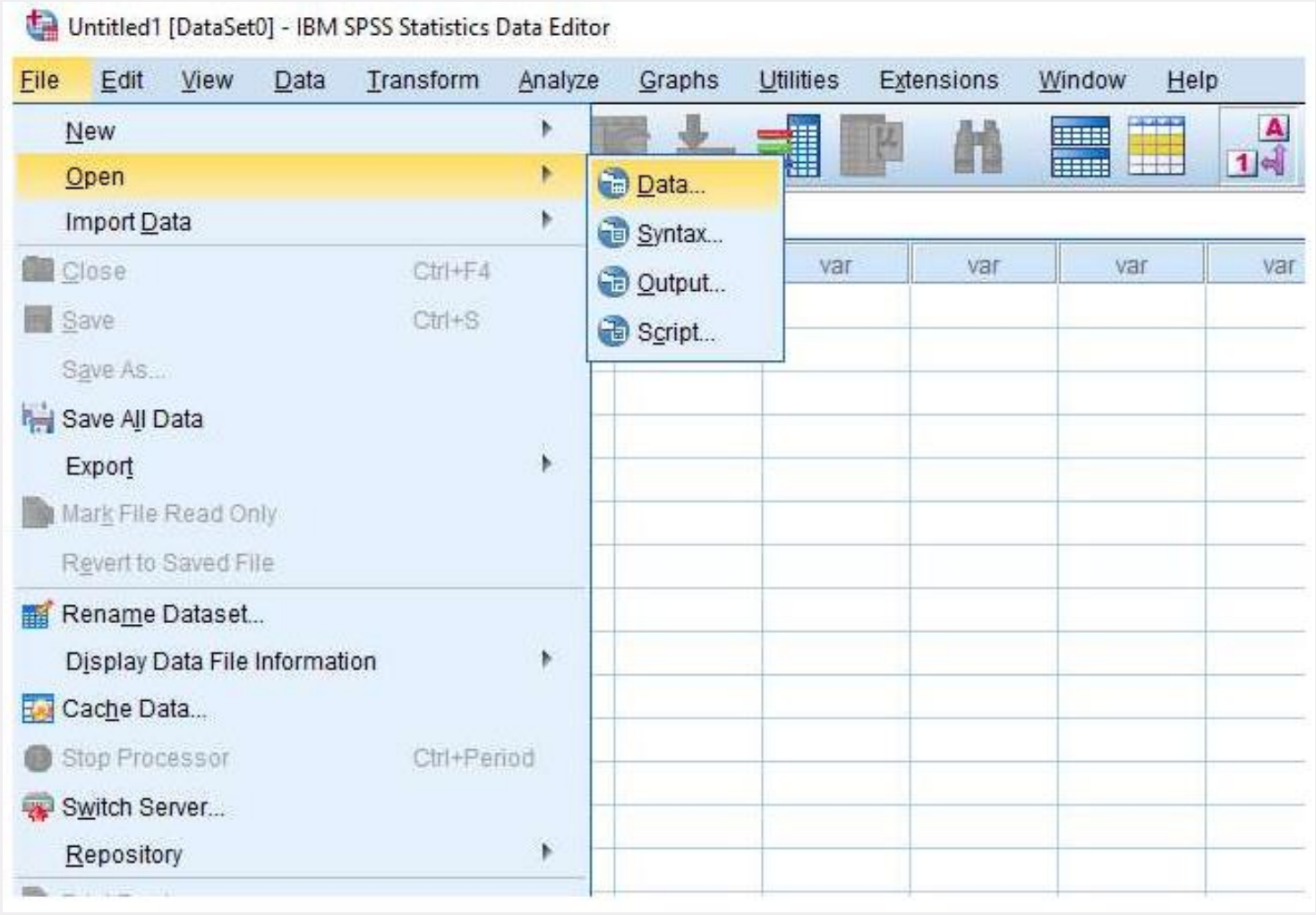



*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor
File Edit View Data Transform Analyze Graphs Utilities Extensions Window Help
Visible: 5 of 5 Variables
InterviewID Name Gender Age Rice var var var var var var var
1 1 Peter Male 15 Yes
2 2 Marian Female 20 Yes
3 3 John Male 18 No
4 4 James Male 13 Yes
5 5 Peter Male 18 Yes
6 6 Emily Female 19 No
7 7 Erica Female 22 No
8 8 Jean Female 25 Yes
9 9 Jane Female 22 No
10 10 Victoria Female 26 No
11 11 Sean Male 17 Yes
12 12 Ryan Male 19 Yes
13 13 Kelvin Male 22 Yes
14 14 Sangwani Male 23 No
15 15 Robert Male 22 Yes
16 16 Ralph Male 18 Yes
17 17 Cicy Female 19 No
18 18 Maggie Female 25 Yes
19 19 Chifundo Female 22 No
20 20 Sellina Female 25 Yes
Data View
Variable View
IBM SPSS Statistics Processor is ready
Unicode:ON

03 Step-by-Step SPSS Data Analysis Process

B/-Importing Data from Excel into SPSS

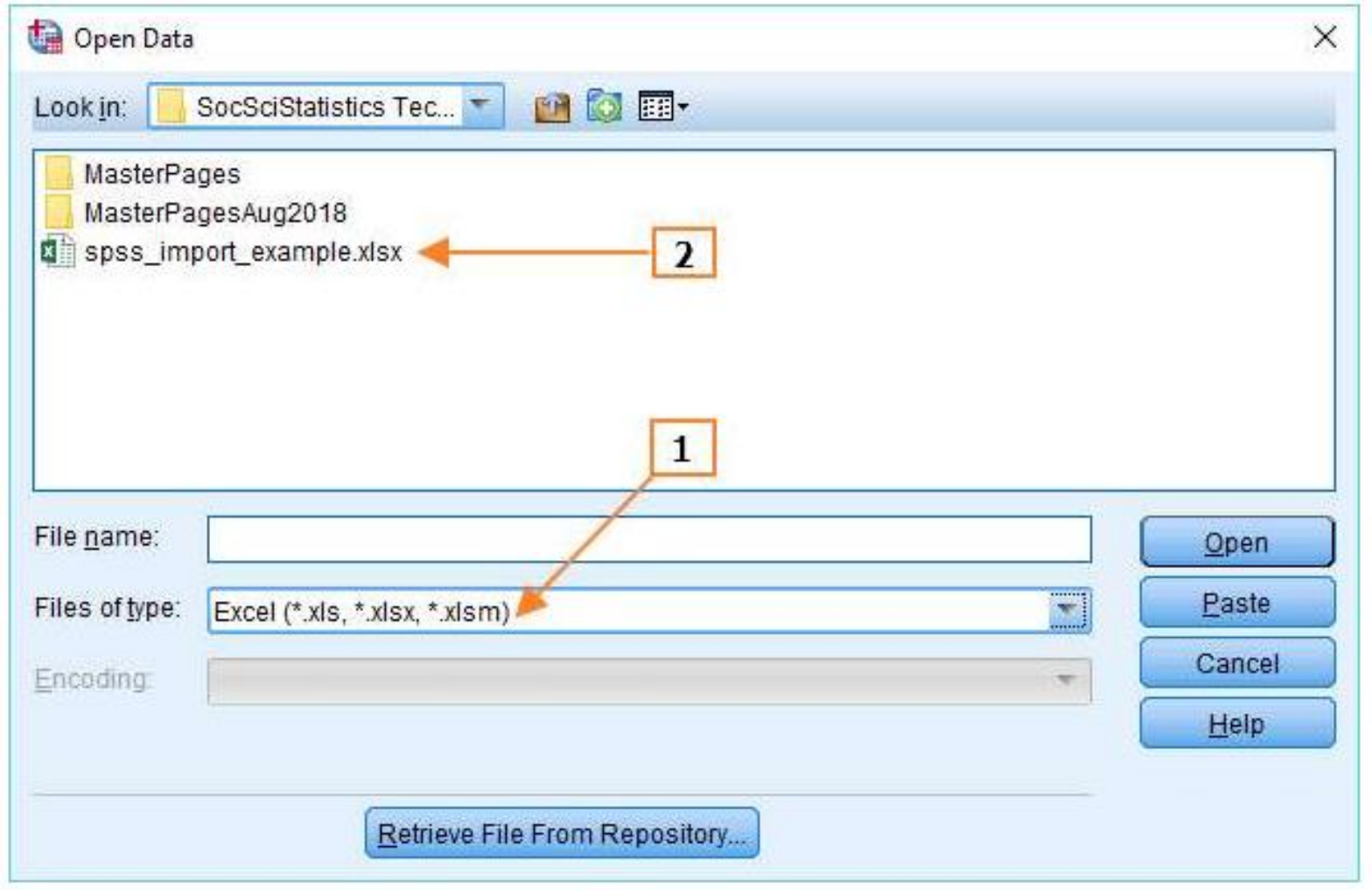
To start, click File -> Open -> Data (as below).



03 Step-by-Step SPSS Data Analysis Process

B/-Importing Data from Excel into SPSS

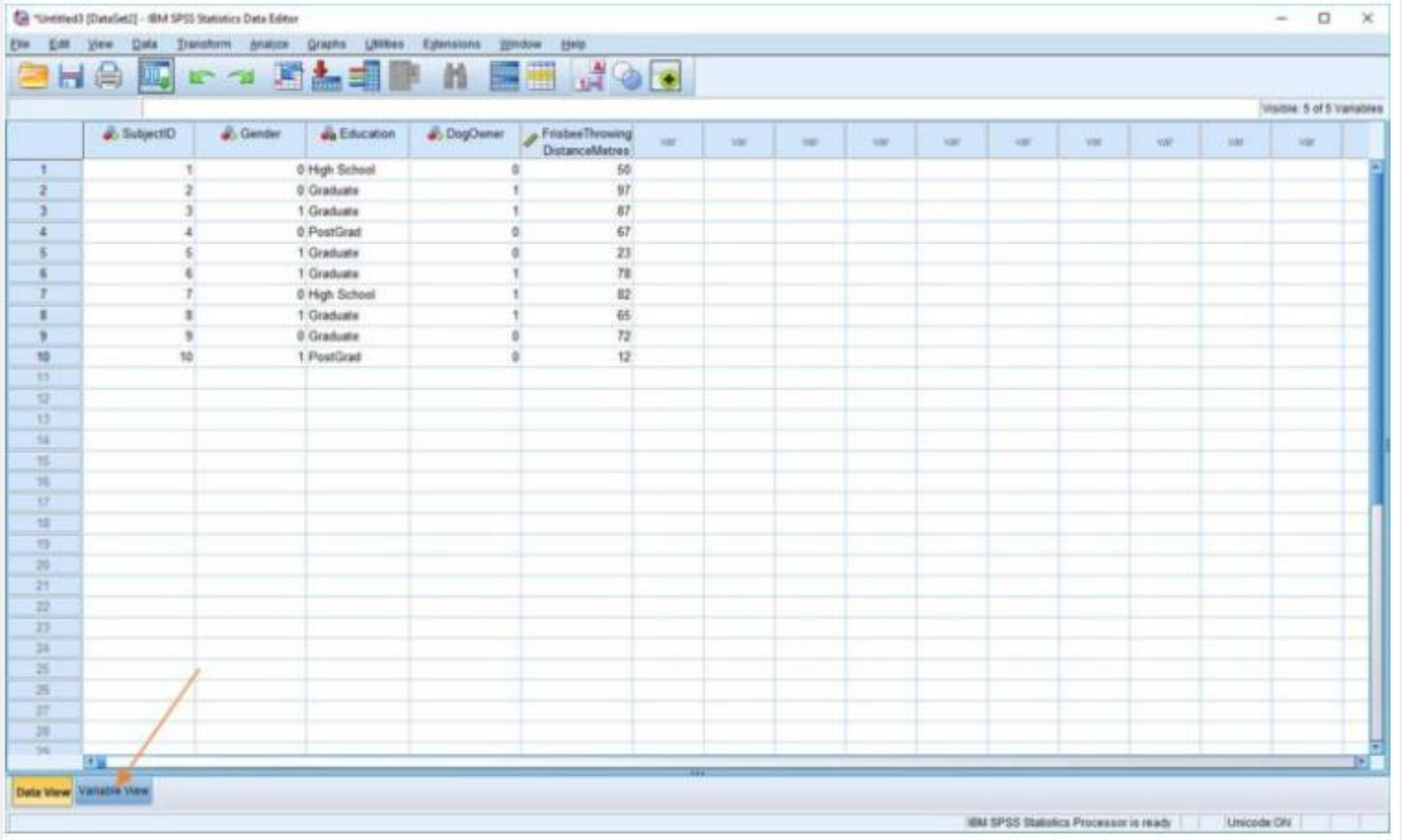
Once you click Data, the Open Data box will appear.



03 Step-by-Step SPSS Data Analysis Process

-Check Your Data Within SPSS

SPSS will import your data into a new Data View.



03 Step-by-Step SPSS Data Analysis Process

Obviously, the first thing to do here is to check that the data has come across successfully. If everything looks okay, the next stage is to check whether the various data parameters have been set correctly. Is numerical data correctly set as numerical, for example?

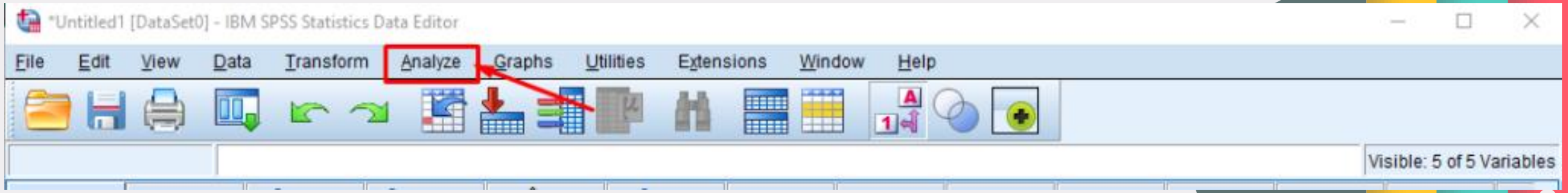
To check this, click on the Variable View tab.

When importing data, SPSS defines variables automatically, but it's still important to review and adjust the settings in the Variable View to ensure accuracy before performing any analysis

03 Step-by-Step SPSS Data Analysis Process

Step 3: Data Analysis

There are numerous kinds of data analysis available in SPSS and all of them are found under the **Analyze** option on the menu.



In this lesson, we will look at basic descriptive statistics.

A/- Analyzing categorical variables

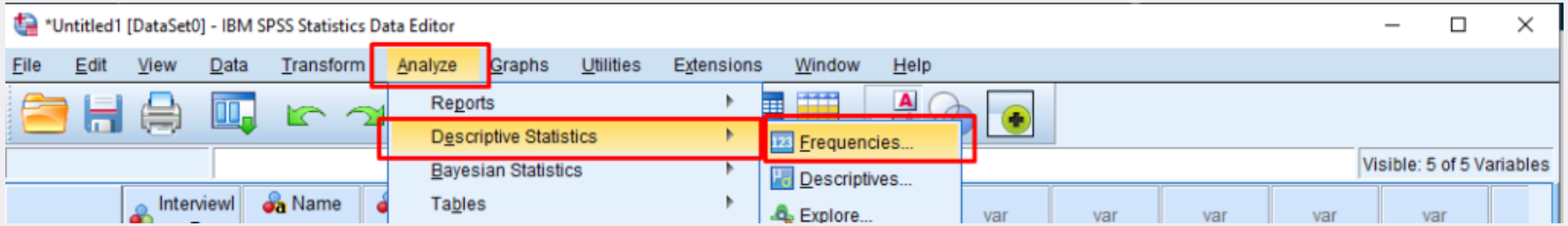
Variables that were designated as **ordinal or nominal** are best analyzed using frequencies. Frequencies are simply the number of times a value appears in the data set. For example, we may be interested to know how many people were male and how many were female.

03 Step-by-Step SPSS Data Analysis Process

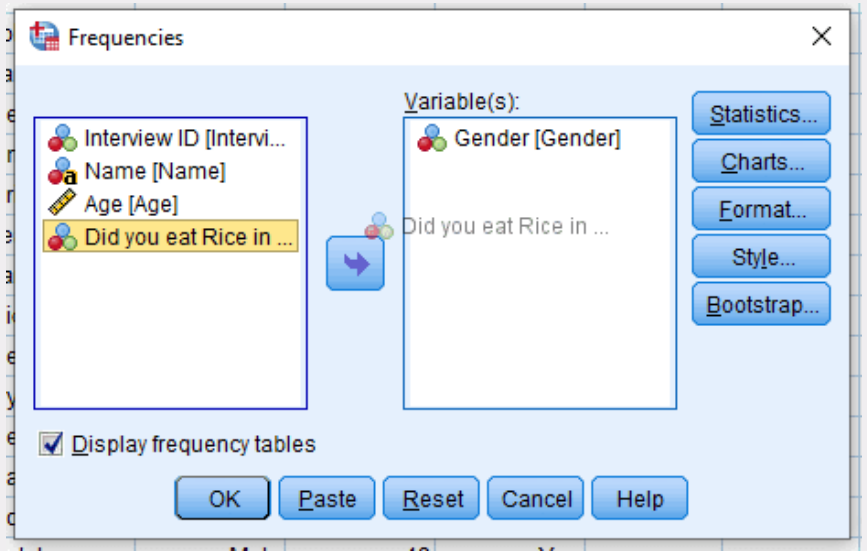
Step 3: Data Analysis

A/- Analyzing categorical variables

Click on the Analyze item on the menu, point on Descriptive statistics and click Frequencies



On the dialog box, Click and drag the Gender variable to the box on the right

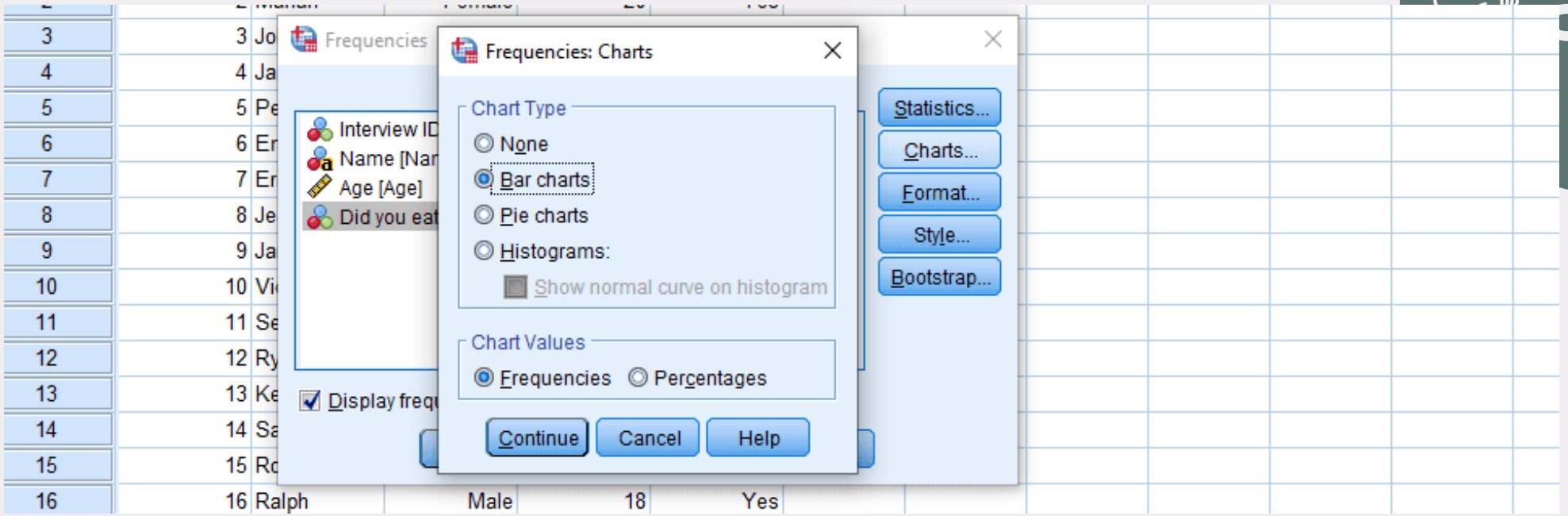


03 Step-by-Step SPSS Data Analysis Process

Step 3: Data Analysis

A/- Analyzing categorical variables

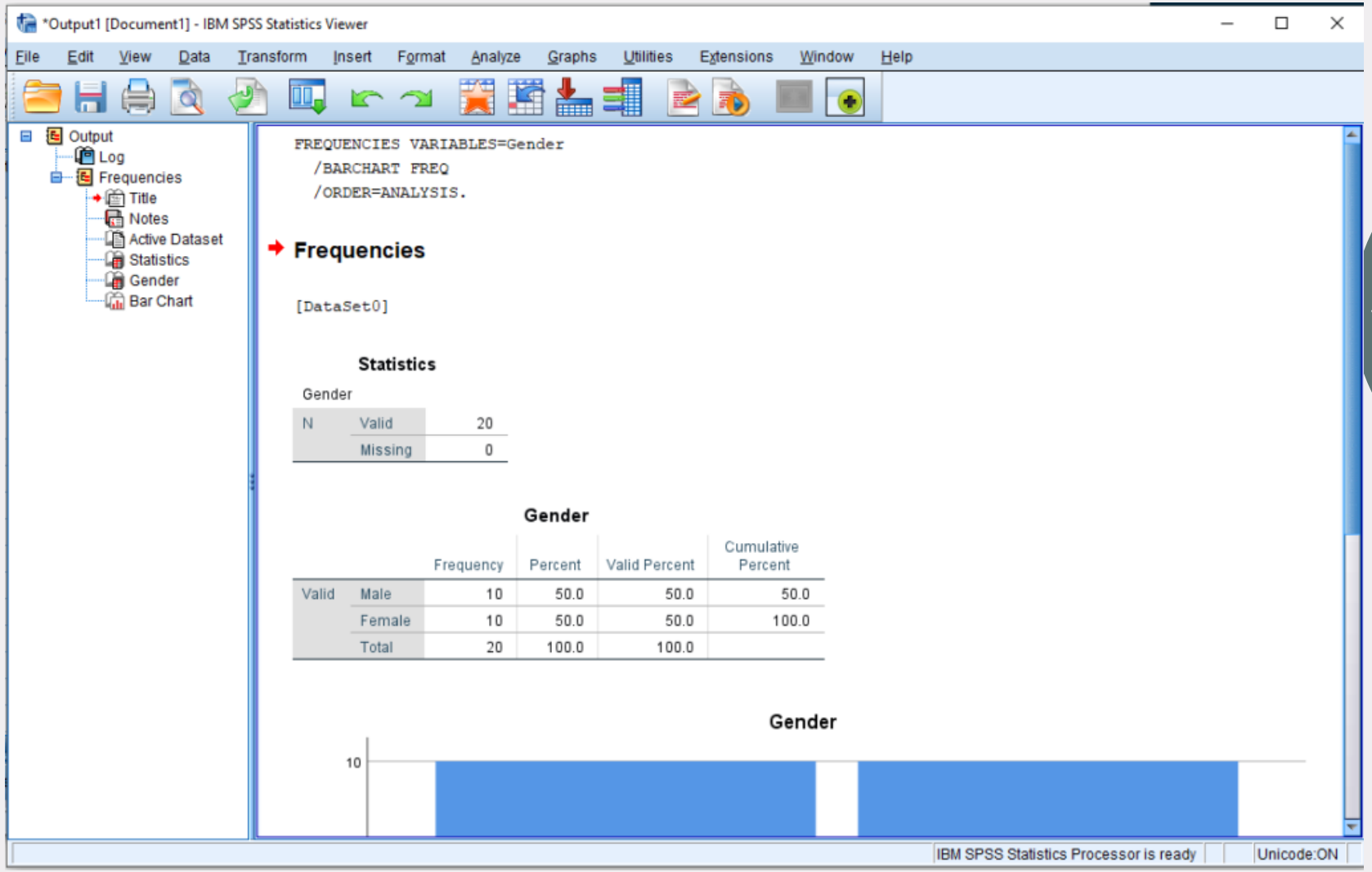
- Do the same for the “Did you eat Rice in the past 7 days?”
- Click the Charts button on the right of the dialog box
- Choose bar charts and click Continue



03 Step-by-Step SPSS Data Analysis Process

Click **OK**

A new window called the Viewer will appear with the results of your analysis



03 Step-by-Step SPSS Data Analysis Process

The first table in the output are the **Statistics**. Since we did not select any statistics, we only have 2 values: Valid and Missing.

- The **Valid** number represents the number of cases that have valid responses on the variable.
- The **Missing** number represents the number of cases that did not provide a valid response to the variable

The second table is the Table of Frequencies.

- **Frequency**: The count of how often a value appears in the dataset.
- **Percent**: The frequency expressed as a percentage of the total cases.
- **Valid Percent**: The percentage based on only the valid (non-missing) cases; typically reported.
- **Cumulative Percent**: The running total of the Valid Percent column up to the current row.

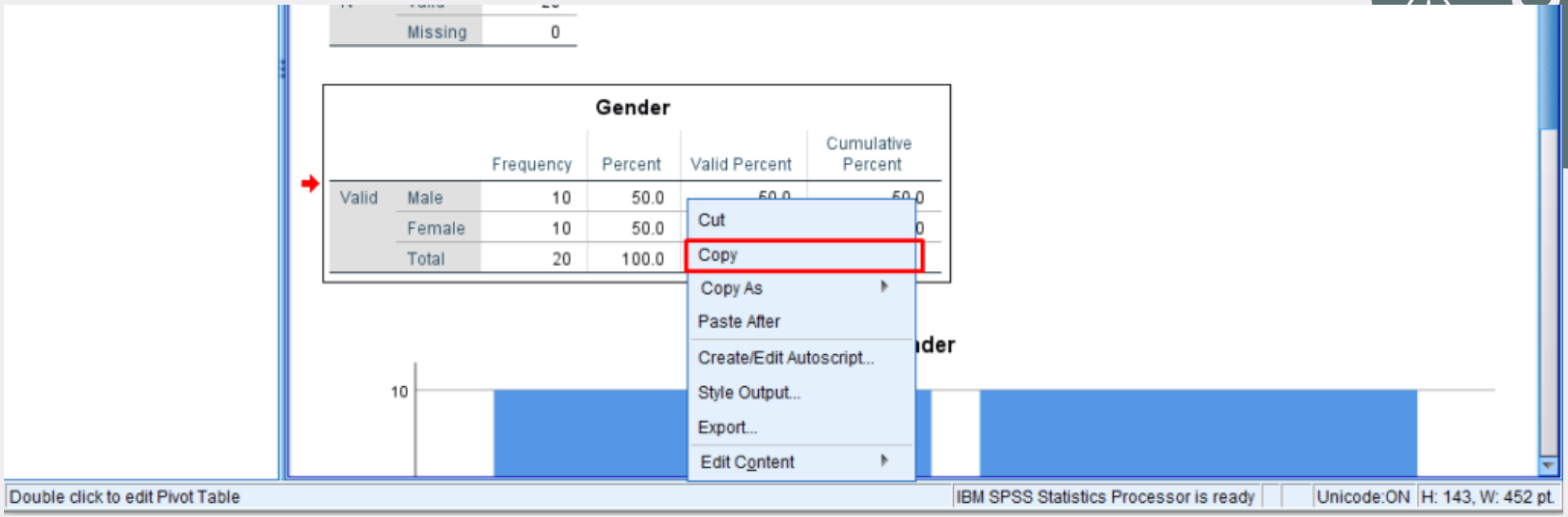


03 Step-by-Step SPSS Data Analysis Process

To report the results from the table you can say:

There was a total of 20 respondents in the survey. Out of this, 10 were Male, and 10 others were Female – each representing 50% of the sample respectively.

To get the output to Microsoft Word for your reporting, just right-click on the output e.g. a chart or a table and select copy. In Microsoft Word, right click where you want the chart or table to go and select paste.



03 Step-by-Step SPSS Data Analysis Process

B/-Analyzing continuous (scale variables)

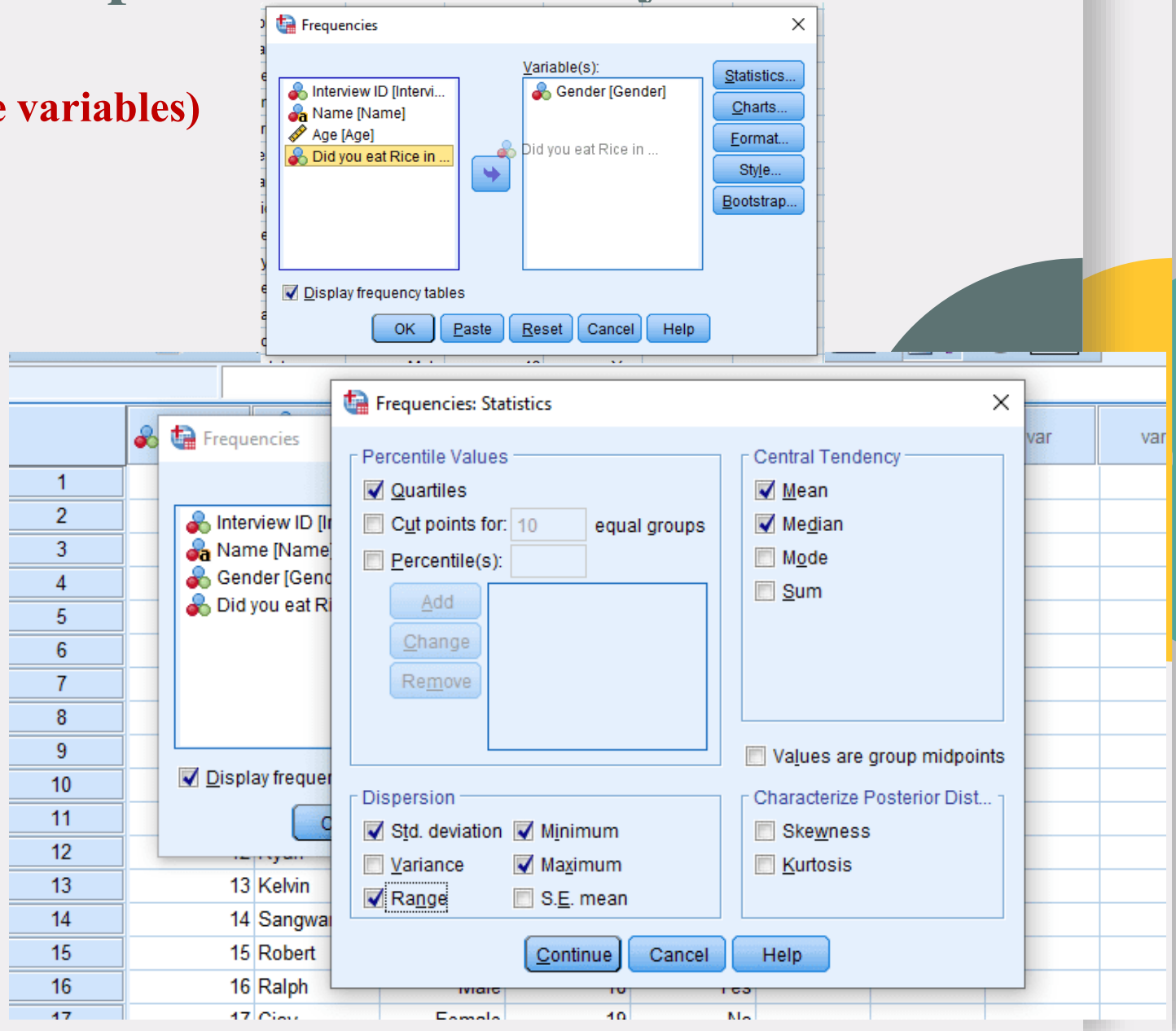
The frequency table that we produced in the last analysis wont work well with variables that have many different data values, for example age.

To analyze scale variables, we first find the **average** or **central point** using the **mean**, **median**, or **mode** (measures of central tendency).
However, this isn't enough. We also need to see how **spread out** the values are using measures of variability, like the **range**, **variance**, and **standard deviation**.

03 Step-by-Step SPSS Data Analysis Process

B/-Analyzing continuous (scale variables)

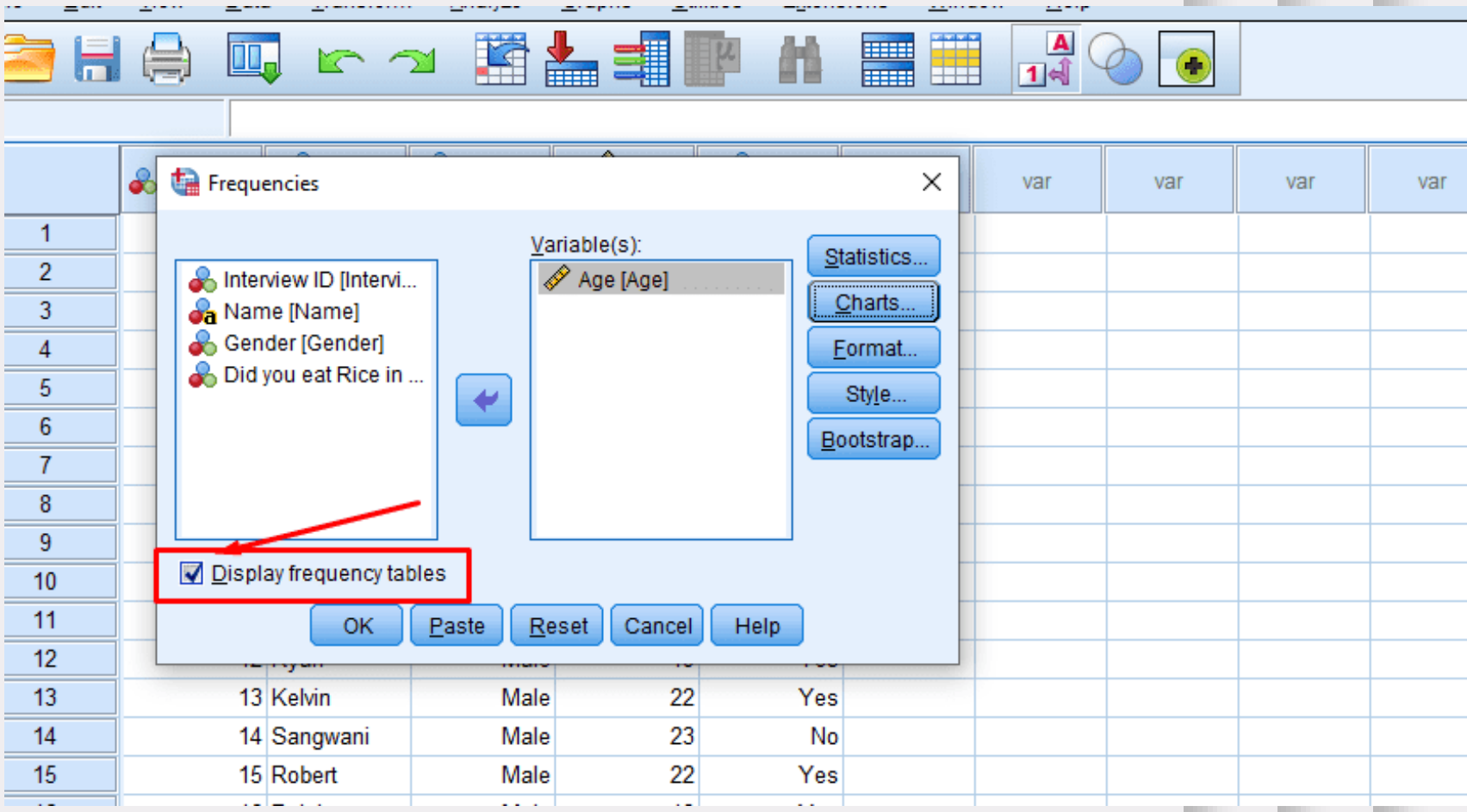
- Back in the SPSS data editor window, click Analyze -> Descriptive Statistics -> Frequencies
- Click the **Reset** button at the bottom of the dialog box
- Move the Age variable to the box on the right by dragging and dropping
- Click the **Statistics** button
- Put checkmarks on Mean, Median, Std Deviation, Range, Minimum, Maximum and Quartiles



03 Step-by-Step SPSS Data Analysis Process

B/-Analyzing continuous (scale variables)

- Click **Continue**
- Click the **Charts** button
- Select Histogram and turn on “Show normal curve on histogram”
- Click **Continue**
- Turn off “**Display Frequency Table”** option at the bottom left of the Frequencies dialog box

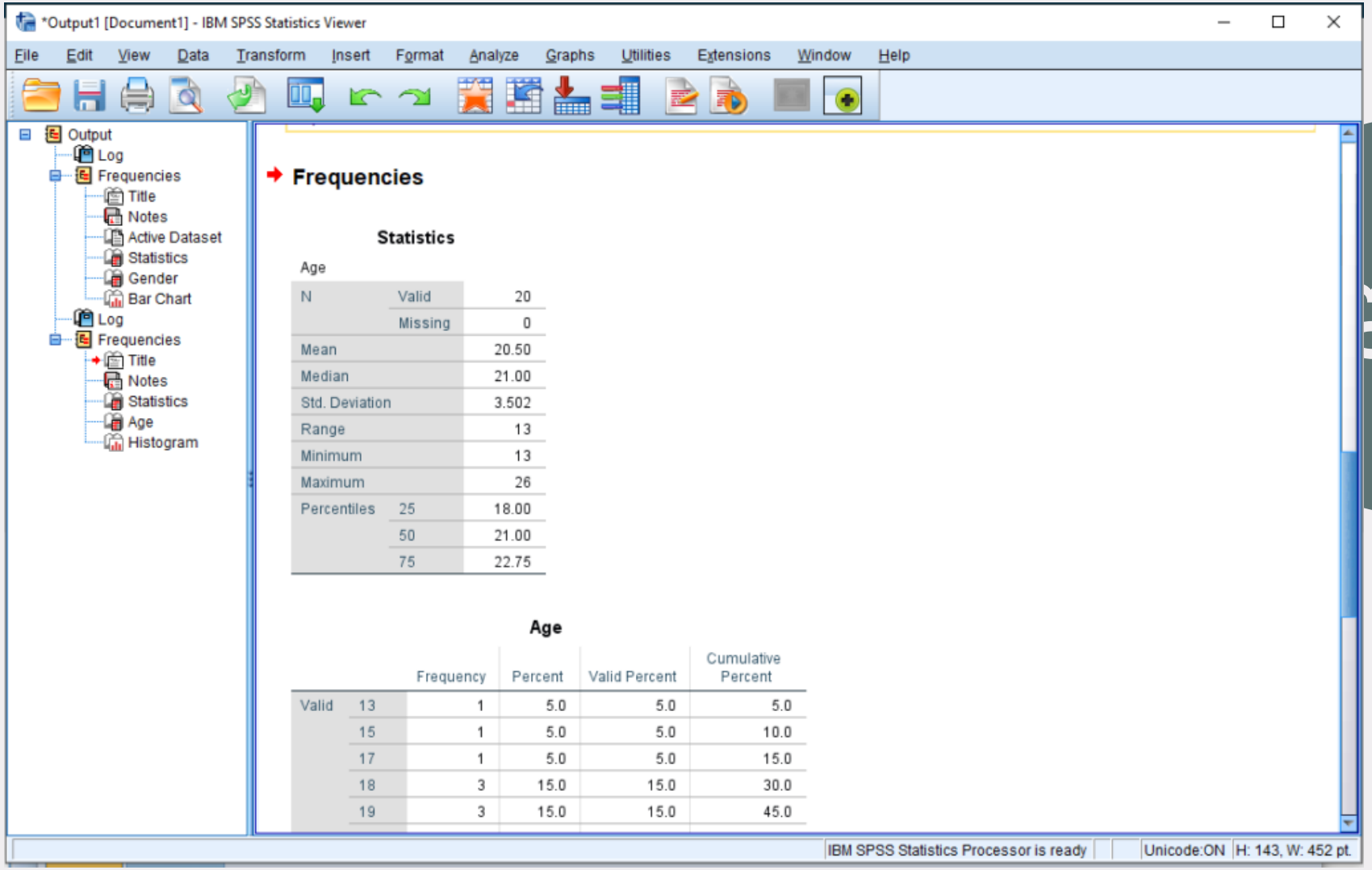


03 Step-by-Step SPSS Data Analysis Process

Click **OK**

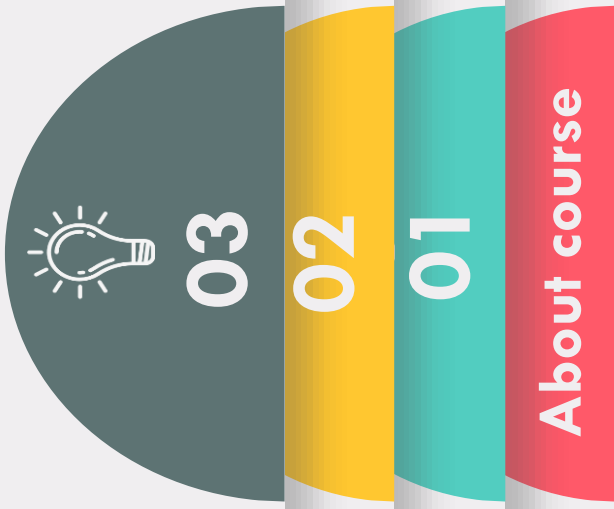
Once again, you will have your output appear in the Viewer window.

This time with more statistics, the ones we selected in the Statistics options dialog box



03 Step-by-Step SPSS Data Analysis Process

In conclusion, SPSS is a powerful and user-friendly tool for data analysis. It allows users to input, organize, and analyze data efficiently. By understanding its key features, such as the Data View, Variable View, and analytical functions, users can effectively summarize and interpret data, making it an essential tool for researchers, students, and professionals.



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Webography

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Thank You!