

Scientific Research Workshops - A Practical Perspective

Prepared by Dr. Mona Moustafa Elashry

Session 9





مجموعة جامعة
الجميع الذكية
للتعليم القابضة

MIDOCEAN
UNIVERSITY
BY EVERYONE'S SMART UNIVERSITY

“Statistical Analysis Part 2”

Prepared by

Dr. Mona Moustafa Elashry

www.midocean.ae



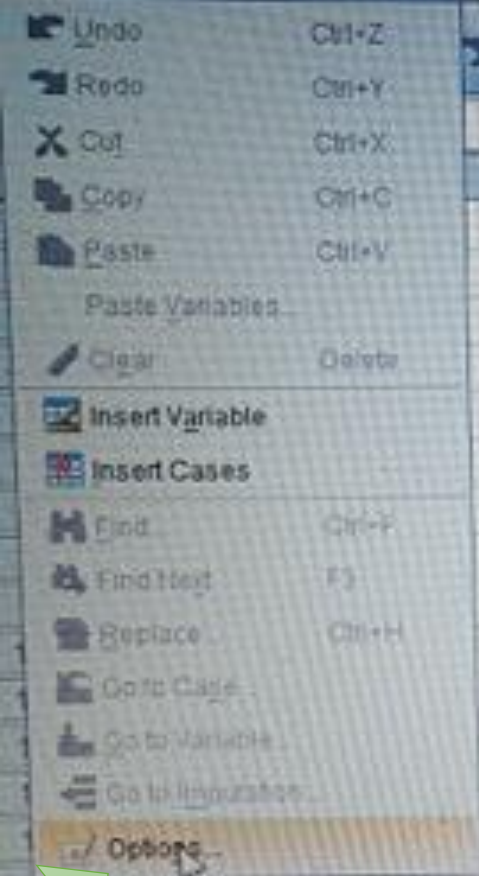
Session Outline

- Change SPSS Language
- How to import data file to SPSS
- How to label data in SPSS?
- How to compute a mean variables?
- Descriptive Statistic Analysis
- Normality Test
- Multicollinearity Test
- Kaiser–Meyer–Olkin (KMO) and Bartlett of sphericity Tests

Change SPSS Language

1



[illegible]

2



3

File Edit View Data Transform Analyze Display Help

var var var

1
2
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21
22
23

Data View Variable View

Options

Pivot Tables File Locations Scripts Multiple Imputations Syntax Editor

General Viewer Data Currency Output Labels Charts

Variable Lists

- ☒ Display labels
- ☐ Display names

☐ Alphabetical

- ☒ File
- ☐ Measurement level

Roles

To save time, some dialogs allow the use of predefined field roles to automatically assign variables (fields) to lists in dialogs.

- ☒ Use predefined roles
- ☐ Use custom assignments

Windows

Look and feel: SPSS Standard

- ☐ Open syntax window at startup
- ☐ Open only one dataset at a time

Output

- ☐ Ng scientific notation for small numbers in tables
- ☐ Apply locale's digit grouping format to numeric values

Measurement system: inches

Language: English

Notification

- ☒ Raise viewer window
- ☒ Scroll to new output

Character Encoding for Data and Syntax

- ☒ Locale's writing system
- ☐ Unicode (universal character set)

Character encoding cannot be changed when any non-empty datasets are open

User Interface

Language: English

OK Cancel Apply Help

4

Options

Pivot Tables File Locations Scripts Multiple Imputations Syntax Editor

General Viewer Data Currency Output Labels Charts

Variable Lists

☒ Display labels
☐ Display names

☐ Alphabetical
☒ File
☐ Measurement level

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Character Encoding for Data and Syntax

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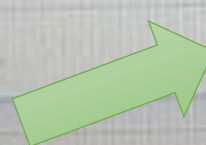
Character encoding cannot be changed when any non-empty datasets are open

User Interface

Language: English

OK Cancel Apply Help

5



Variable View

IBM SPSS Statistics Processor is ready

How to import data file to SPSS

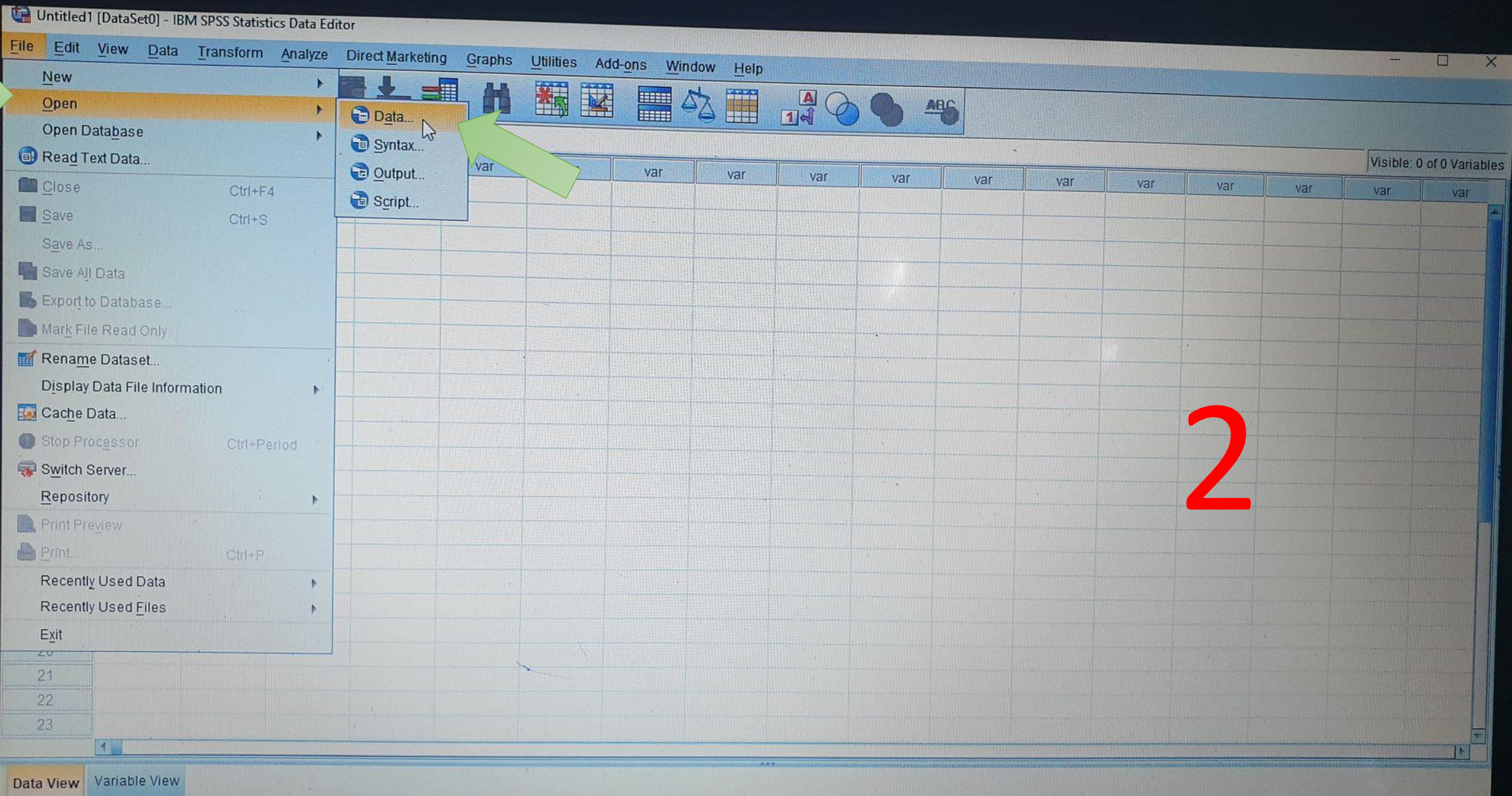
2

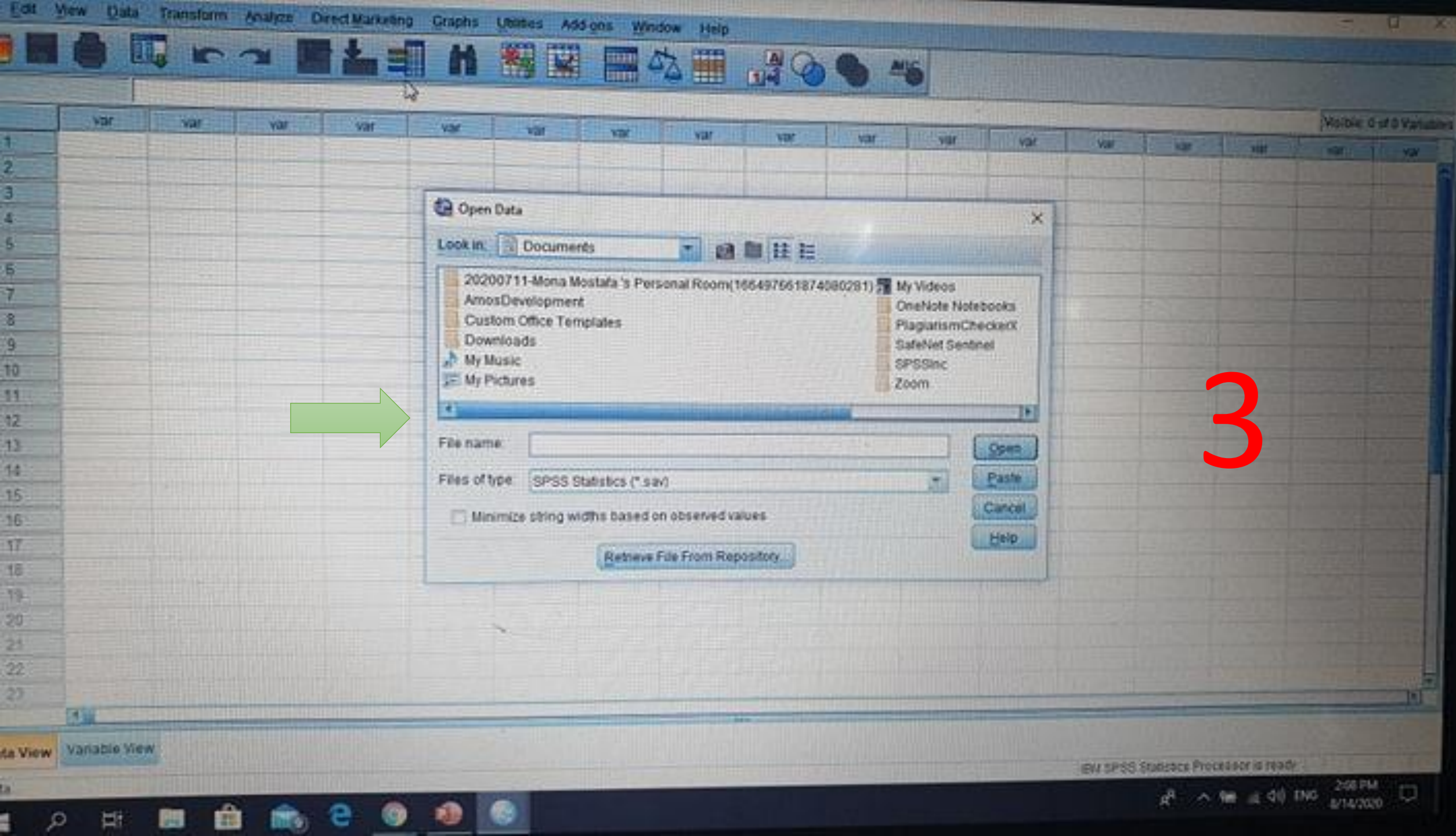




	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	

1







Visible: 0 of

	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var	var
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	



Open Data

Look in: RML 8

- Item Analysis
- Regression
- SPSS v20 - 32bit
- SPSS Original.sav
- Untitled2.sav

File name: SPSS Original.sav

Files of type: SPSS Statistics (*.sav)

☐ Minimize string widths based on observed values

Retrieve File From Repository

Open
Paste
Cancel
Help

4

SPSS Original.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Viewing 12 of 50 Variables

	A1	A2	A3	M1	M2	M3	M4	M5	O1	O2	O3	O4	SQ1	SQ2	SQ3	
1	4	4	3	3	4	3	4	2	3	3	4	3	4	3	3	
2	4	4	3	4	3	2	4	3	3	3	4	4	4	4	4	
3	3	2	3	2	2	2	4	2	3	3	4	3	5	4	4	
4	1	3	2	1	1	1	4	1	1	1	1	2	3	3	3	
5	2	2	2	2	1	2	2	2	1	2	2	2	2	3	3	
6	3	4	4	4	5	3	4	2	2	4	4	4	4	4	4	
7	2	3	4	1	1	2	5	1	1	1	1	1	3	2	3	
8	2	3	4	2	3	1	2	1	1	1	3	2	4	2	3	
9	5	5	5	4	4	4	4	4	4	4	2	2	3	3	3	
10	4	3	2	3	4	3	4	1	3	3	4	3	3	3	3	
11	5	4	5	4	4	4	3	3	2	2	2	1	3	2	3	
12	5	5	4	3	3	3	3	3	3	3	4	4	4	3	3	
13	5	5	5	5	5	5	5	5	2	2	2	2	2	2	2	
14	4	5	4	5	4	5	4	2	3	2	3	4	3	2	2	
15	3	2	3	4	4	4	4	2	2	3	4	4	3	3	3	
16	2	2	2	2	3	2	3	1	1	2	2	2	3	4	4	1
17	4	2	1	4	4	2	5	2	4	4	5	3	4	3	2	
18	4	4	4	4	3	4	5	2	2	3	4	4	2	3	3	
19	1	4	3	3	1	2	4	3	3	4	3	3	4	4	2	
20	4	4	4	3	3	4	4	5	5	5	4	4	2	3	3	
21	5	5	4	4	5	4	5	5	4	2	4	2	4	2	3	
22	4	4	4	4	4	5	5	2	5	5	4	4	5	1	5	
23	5	5	5	5	5	5	4	5	5	5	4	4	5			

Data View Variable View

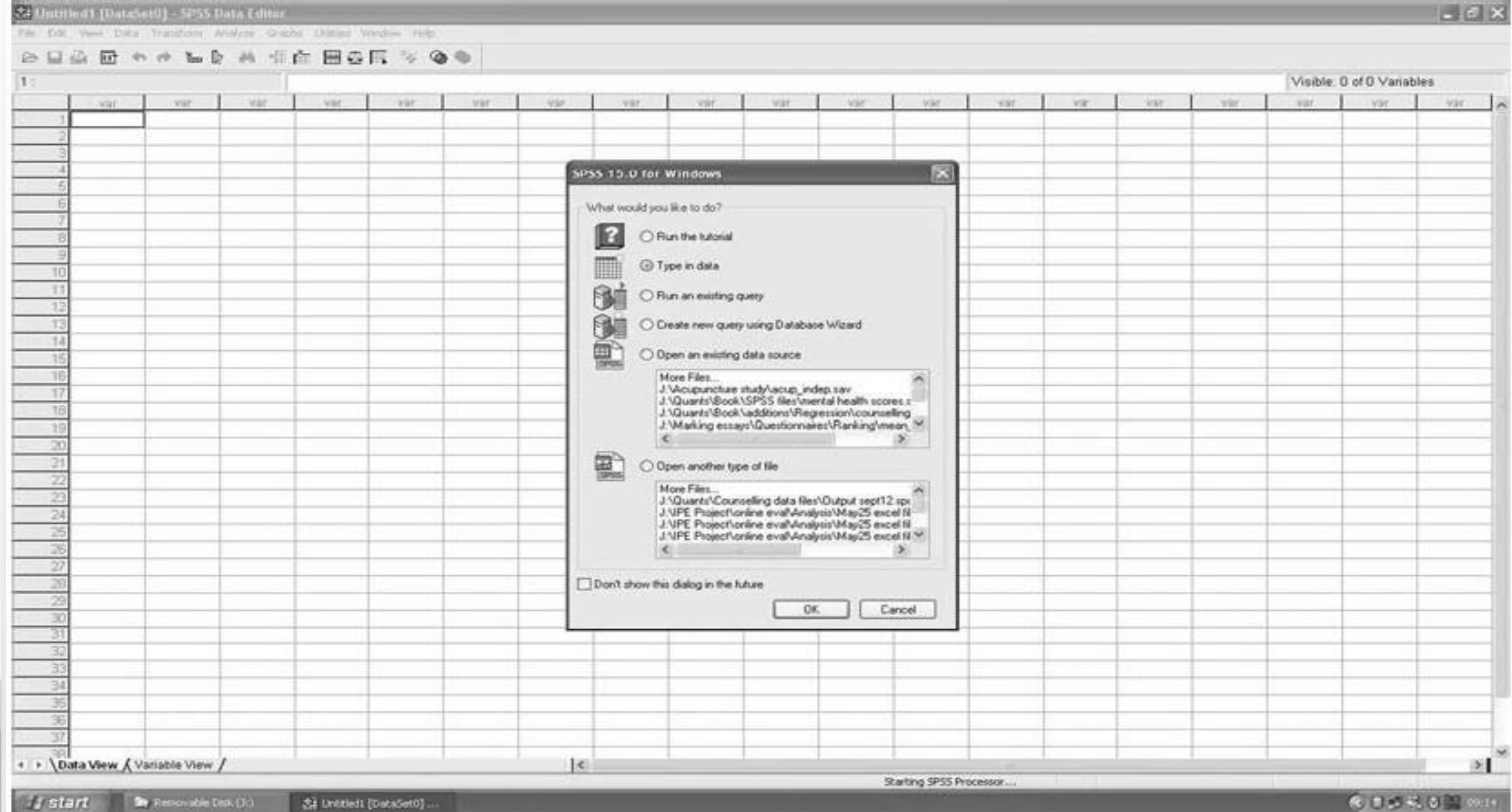
IBM SPSS Statistics Processor is ready

2:10 PM 8/14/2025

How to label data in SPSS?

3

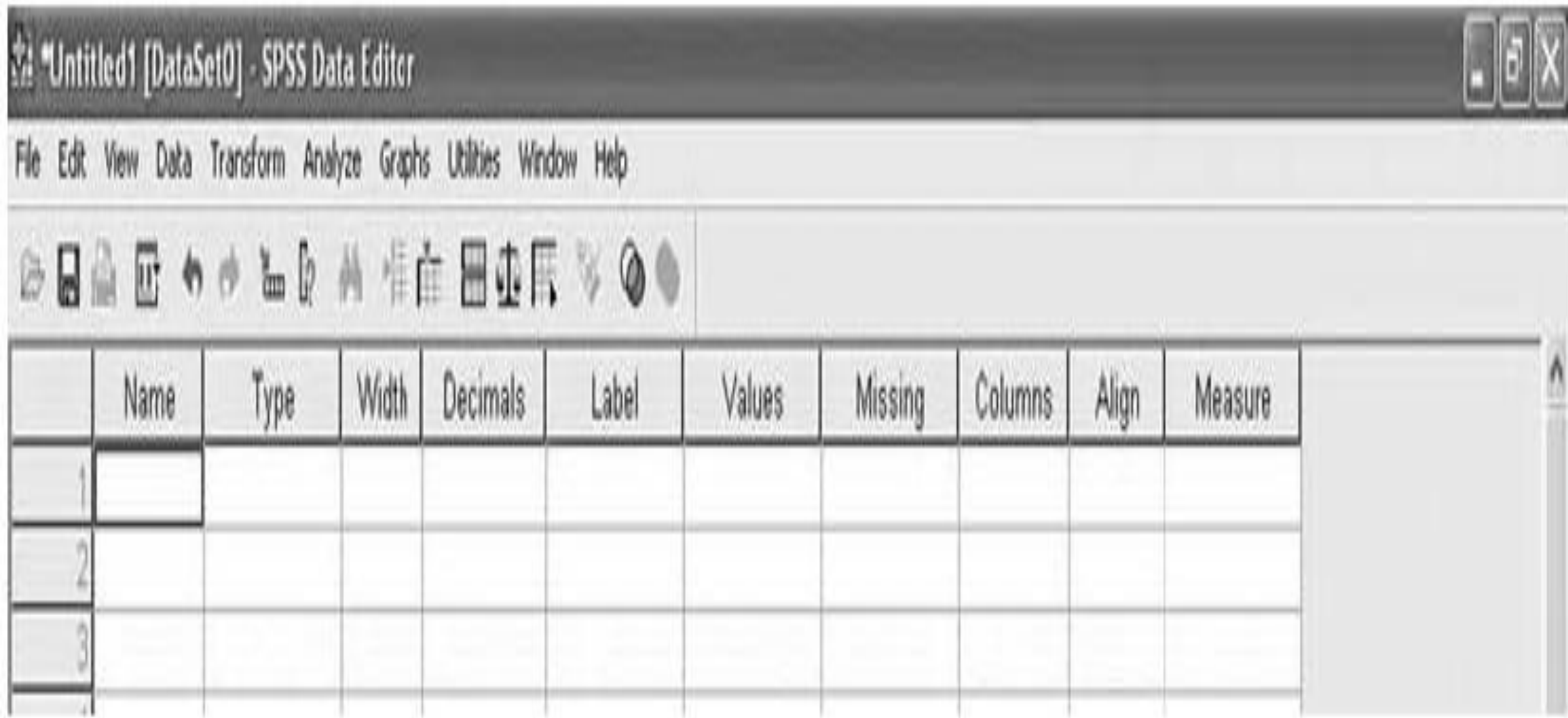




Data View

Variable View

Defining variables





	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure
1	patient	Numeric	8	2		None	None	8	Right	Scale
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										

Variable Type

☒ Numeric
☐ Comma
☐ Dot
☐ Scientific notation
☐ Date
☐ Dollar
☐ Custom currency
☐ String

Width:
 Decimal Places:

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Extensions Window Help



*computer_parts.sav [						Role
File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help						
	Name	Type	Label	Values	Missing	
1	name	String	STRING VARIABLE		None	Input
2	weight	Numeric			Input	
3	date	Date	NUMERIC VARIABLES		None	Input
4	time	Date			Input	
5	datetime	Date			Input	
6	commission	(!)		None	None	
7	price	Dollar		None	None	
8						

Data View Variable View

[illegible]



	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	ID	Numeric	8	0	Participant ID	None	None	8	Right	Unknown	Input
2	Gender	Numeric	8	0	Gender	None	None	8	Right	Scale	Input
3	Travel_Time	Numeric	8	0	Time it takes to travel into Uni (min)	None	None	8	Right	Unknown	Input
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											

Value Labels

Value Labels

Value: 1

Label:

0 = "Male"

Add Change Remove

OK Cancel Help

ParticipantID	Gender	Travel
1	0	35
2	0	15
3	1	42
4	0	65
5	1	27



1 : name

	name	var	var	var	var	var
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						

*SPSS Original.sav [DataSet1] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Descript Marketing Graphs Utilities Add-ons Window Help

Visible: 50 of 50

	OA7	OA8	Ability	Motivation	Opportunity	OA	SQ	IQ	SVQ	KMS	IS-WIS	var
1	7	6	7	4	3	3	7	3	5	4	4	3
2	6	6	6	4	3	4	6	4	4	4	4	3
3	6	6	7	3	2	3	7	4	5	4	4	3
4	4	4	5	2	2	1	5	3	3	3	3	2
5	3	3	3	2	2	2	3	3	3	3	3	2
6	6	6	6	4	4	4	7	4	4	4	4	4
7	6	6	6	3	2	1	6	3	3	3	3	2
8	5	2	4	3	2	2	5	2	3	4	3	2
9	6	6	6	5	4	3	6	3	3	3	3	4
10	4	3	2	3	3	3	4	3	3	3	3	3
11	5	4	5	5	4	2	5	2	4	3	3	3
12	5	5	5	5	3	4	5	3	4	4	3	4
13	5	5	5	5	5	3	5	2	2	3	2	4
14	5	2	3	4	4	3	5	3	3	3	3	4
15	6	5	5	3	4	3	6	3	3	3	3	3
16	5	5	4	2	2	2	4	3	3	3	3	2
17	7	7	7	2	3	3	7	3	4	4	4	3
18	5	6	6	4	4	4	6	4	5	4	4	4
19	5	6	6	4	4	3	6	3	3	3	3	3
20	5	5	5	3	2	3	6	4	4	3	4	4
21	5	5	6	4	3	3	6	3	4	3	3	5
22	7	6	5	5	5	5	7	3	4	4	4	4
23	6	6	6	4	4	6	7	5	5	5	5	5

How to compute a mean
variables?

4





Visible: 50 of

	A1	A2	A3	M1	M2	M3	M4	M5	O1	O2	O3	O4	SQ1	SQ2	SQ3
1	4	4	3	3	4	3	4	2	3	3	4	3	4	3	
2	4	4	3	4	3	2	4	3	3	3	4	4	4	4	
3	3	2	3	2	2	2	4	2	3	3	4	3	5	4	
4	1	3	2	1	1	1	4	1	1	1	1	2	3	3	
5	2	2	2	2	1	2	2	2	1	2	2	2	2	3	
6	3	4	4	4	5	3	4	2	2	4	4	4	4	4	
7	2	3	4	1	1	2	5	1	1	1	1	1	3	2	
8	2	3	4	2	3	1	2	1	1	1	3	2	4	2	
9	5	5	5	4	4	4	4	4	4	4	2	2	3	3	
10	4	3	2	3	4	3	4	1	3	3	4	3	3	3	
11	5	4	5	4	4	4	3	3	2	2	2	1	3	2	
12	5	5	4	3	3	3	3	3	3	3	4	4	4	3	
13	5	5	5	5	5	5	5	5	5	2	2	2	2	2	
14	4	5	4	5	4	5	4	2	3	2	3	2	2	3	
15	3	2	3	4	4	4	4	2	2	3	4	4	3	2	
16	2	2	2	2	3	2	3	1	1	2	2	2	3	3	
17	4	2	1	4	4	2	5	2	1	3	5	3	4	4	
18	4	4	4	4	3	4	5	2	4	4	5	3	4	3	
19	1	4	3	3	1	2	4	2	2	3	4	4	2	3	
20	4	4	4	3	3	4	4	3	3	4	3	3	4	4	
21	5	5	4	4	5	4	5	5	5	5	4	4	2	3	
22	4	4	4	4	4	5	5	2	4	2	4	2	2	3	
23	5	5	5	5	5	5	4	5	5	5	4	4	5	5	

1



	A1	A2	A3
1	4	4	
2	4	4	
3	3	2	
4	1	3	
5	2	2	
6	3	4	
7	2	3	
8	2	3	
9	5	5	
10	4	3	
11	5	4	
12	5	5	
13	5	5	
14	4	5	
15	3	2	
16	2	2	
17	4	2	
18	4	4	
19	1	4	
20	4	4	
21	5	5	
22	4	4	
23	5	5	

Compute Variable

Target Variable:

Numeric Expression:

Type & Label...

A1

A2

A3

M1

M2

M3

M4

M5

O1

O2

O3

O4

SQ1

SQ2

SQ3

SQ4

SQ5

SQ6

SQ7

+

<

>

7

8

9

-

<=

>=

4

5

6

*

=

~

1

2

3

/

&

|

0

**

~

()

Delete

Function group:

All

Arithmetic

CDF & Noncentral CDF

Conversion

Current Date/Time

Date Arithmetic

Date Creation

Functions and Special Variables:

If... (optional case selection condition)

OK

Paste

Reset

Cancel

Help

Visible: 50 of

	SQ1	SQ2	SQ3
3	4	3	
4	4	4	
3	5	4	
2	3	3	
2	2	3	
4	4	4	
1	3	2	
2	4	2	
2	3	3	
3	3	3	
1	3	2	
4	3	3	
2	2	2	
2	2	3	
4	3	2	
2	3	3	
3	4	4	
3	4	3	
4	2	3	
3	4	4	
4	2	3	
2	2	3	
4	5	5	

3



Compute Variable

Target Variable: = Numeric Expression:

Type & Label...

A1 A2 A3 M1 M2 M3 M4 M5 O1 O2 O3 O4 SQ1 SQ2 SQ3 SQ4 SQ5 SQ6 SQ7

Function group:

- Random Numbers
- Search
- Significance
- Statistics
- Scoring
- String
- Time Duration Creation

Functions and Special Variables:

If... (optional case selection condition)

OK Paste Reset Cancel Help

Visible: 50 of 50 Variables

	SQ1	SQ2	SQ3	SQ4
3	4	3	3	3
4	4	4	4	4
3	5	4	4	4
2	3	3	3	3
2	2	3	3	3
4	4	4	4	4
1	3	2	3	3
2	4	2	3	3
2	3	3	3	3
3	3	3	3	3
1	4	2	3	3
4	4	3	3	3
2	2	2	2	2
2	2	3	3	3
4	3	2	2	2
2	3	3	3	3
3	4	4	1	1
3	4	3	2	2
4	2	3	3	3
3	4	4	2	2
4	2	3	3	3
2	2	3	3	3
4	5	5	5	5

4



	A1	A2	A3
1	4	4	
2	4	4	
3	3	2	
4	1	3	
5	2	2	
6	3	4	
7	2	3	
8	2	3	
9	5	5	
10	4	3	
11	5	4	
12	5	5	
13	5	5	
14	4	5	
15	3	2	
16	2	2	
17	4	2	
18	4	4	
19	1	4	
20	4	4	
21	5	5	
22	4	4	
23	5	5	

Compute Variable

Target Variable:

Numeric Expression:

Type & Label...

A1
A2
A3
M1
M2
M3
M4
M5
O1
O2
O3
O4
SQ1
SQ2
SQ3
SQ4
SQ5
SQ6
SQ7

+ < > 7 8 9
- <= >= 4 5 6
* = ~= 1 2 3
/ & | 0
** ~ () Delete

Function group:
Random Numbers
Search
Significance
Statistical
Scoring
String
Time Duration Creation

Functions and Special Variables:
Cfvar
Max
Mean
Median
Min
Sd
Sum
Variance

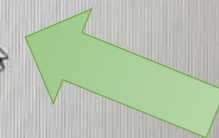
If... (optional case selection condition)

OK Paste Reset Cancel Help

Visible: 50 of 50

	SQ1	SQ2	SQ3
3	4	3	
4	4	4	
3	5	4	
2	3	3	
2	2	3	
4	4	4	
1	3	2	
2	4	2	
2	3	3	
3	3	3	
1	3	2	
4	4	3	
2	2	2	
2	3	2	
4	3	3	
2	3	3	
3	4	4	
3	4	3	
4	2	3	
3	4	4	
4	2	3	
2	2	3	
4	5	5	

5



A2

A3

Target Variable:

Numeric Expression:

Type & Label...

- A1
- A2
- A3
- M1
- M2
- M3
- M4
- M5
- O1
- O2
- O3
- O4
- SQ1
- SQ2
- SQ3
- SQ4
- SQ5
- SQ6
- SQ7

MEAN(?, ?)

+	<	>	7	8	9
-	<=	>=	4	5	6
*	=	~	1	2	3
/	&		0	.	
**	~	()	Delete		

MEAN(numexpr,numexpr[...]). Numeric. Returns the arithmetic mean of its arguments that have valid, nonmissing values. This function requires two or more arguments, which must be numeric. You can specify a minimum number of valid arguments for this function to be evaluated.

Function group:

- Random Numbers
- Search
- Significance
- Statistical
- Scoring
- String
- Time Duration Creation

Functions and Special Variables:

- Cfvar
- Max
- Mean
- Median
- Min
- Sd
- Sum
- Variance

If... (optional case selection condition)

OK Paste Reset Cancel Help

SQ1

SQ2

6

Compute Variable

Target Variable:

Numeric Expression:

Type & Label...

A1
A2
A3
M1
M2
M3
M4
M5
O1
O2
O3
O4
SQ1
SQ2
SQ3
SQ4
SQ5
SQ6
SQ7

+ < > 7 8 9
- <= >= 4 5 6
* = ~= 1 2 3
/ & | 0
** ~ () Delete

MEAN(numexpr,numexpr[,...]). Numeric. Returns the arithmetic mean of its arguments that have valid, nonmissing values. This function requires two or more arguments, which must be numeric. You can specify a minimum number of valid arguments for this function to be evaluated.

If... (optional case selection condition)

Function group:
Random Numbers
Search
Significance
Statistical
Scoring
String
Time Duration Creation

Functions and Special Variables:
Cfvar
Max
Mean
Median
Min
Sd
Sum
Variance

OK Paste Reset Cancel Help

	SQ1	SQ2	Visit
3	4	3	
4	4	4	
3	5	4	
2	3	3	
2	2	3	
4	4	4	
1	3	2	
2	4	2	
2	3	3	
3	3	3	
1	3	2	
4	4	3	
2	2	2	
2	2	3	
4	3	2	
2	3	3	
3	4	4	
3	4	3	
4	2	3	
3	4	4	
4	2	3	
2	2	3	
4	5	5	

FileEditViewDataTransformAnalyzeDirect MarketingGraphsUtilitiesAdd-onsWindowHelp

A1A2A3

44

44

32

13

22

34

23

23

55

43

54

55

55

45

32

22

22

42

44

14

44

55

44

55

SQ1SQ2SQ3

343

444

354

233

223

444

132

242

233

333

132

443

223

223

344

344

344

423

344

423

223

455

Compute Variable

Target Variable:

Type & Label...

Numeric Expression:

MEAN(A1,)

A1A2A3M1M2M3M4M5O1O2O3O4SQ1SQ2SQ3SQ4SQ5SQ6SQ7

+<>789

-<=>=456

*=~=123

/&|0

**~()Delete

MEAN(numexpr,numexpr[...]). Numeric. Returns the arithmetic mean of its arguments that have valid, nonmissing values. This function requires two or more arguments, which must be numeric. You can specify a minimum number of valid arguments for this function to be evaluated.

If... (optional case selection condition)

OKPasteResetCancelHelp

Function group:

Random Numbers

Search

Significance

Statistical

Scoring

String

Time Duration Creation

Functions and Special Variables:

Cfvar

Max

Mean

Median

Min

Sd

Sum

Variance

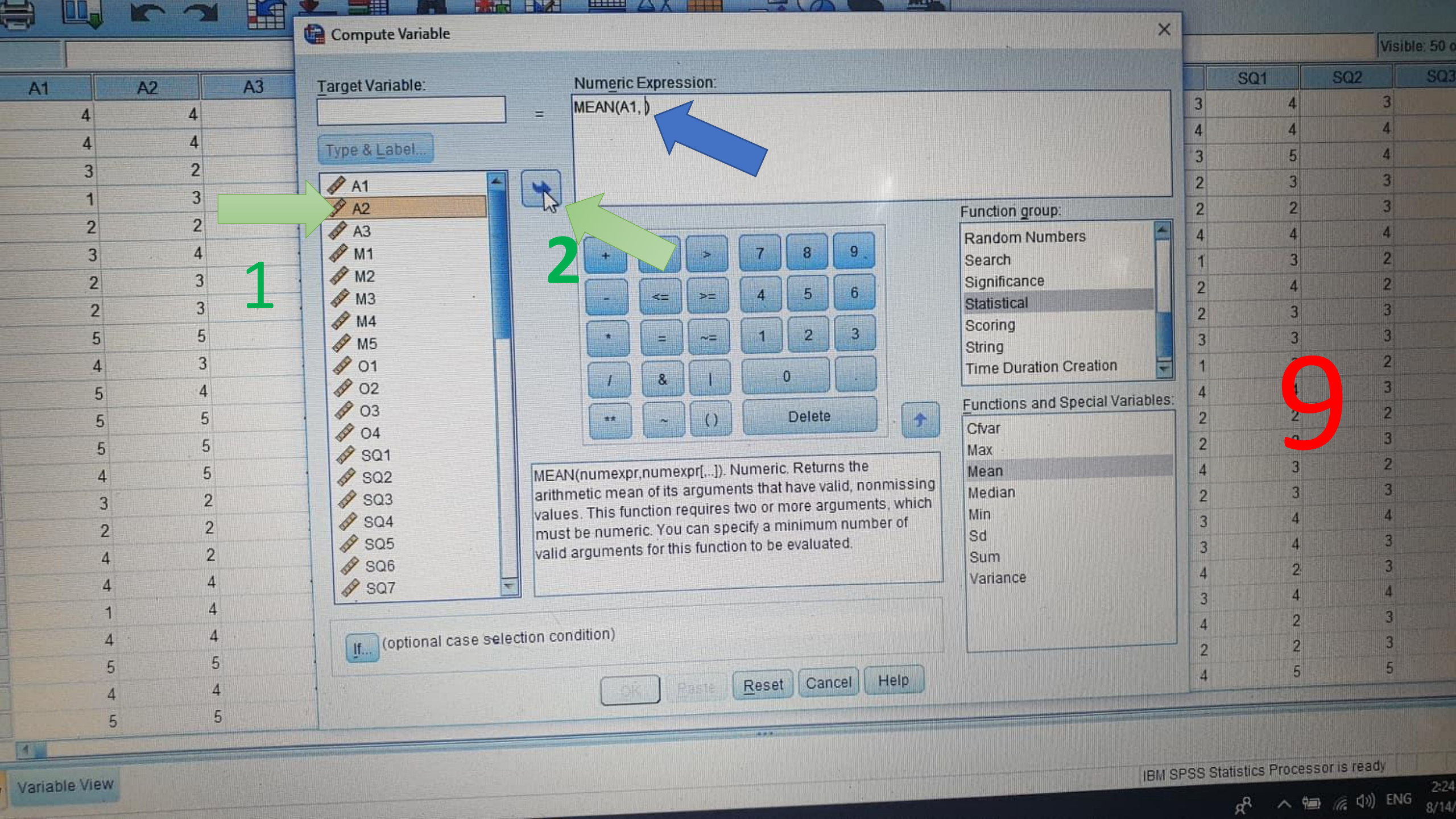
Visible: 50 of

8

Variable View

IBM SPSS Statistics Processor is ready

2:24



A1	A2	A3
4	4	
4	4	
3	2	
1	3	
2	2	
3	4	
2	3	
2	3	
5	5	
4	3	
5	4	
5	5	
5	5	
4	5	
3	2	
2	2	
4	2	
4	4	
1	4	
4	4	
5	5	
4	4	
5	5	

Target Variable:

Type & Label...

A1

A2

A3

M1

M2

M3

M4

M5

O1

O2

O3

O4

SQ1

SQ2

SQ3

SQ4

SQ5

SQ6

SQ7

←

Numeric Expression:

+

<

>

7

8

9

-

<=

>=

4

5

6

*

=

~=

1

2

3

/

&

|

0

.

**

~

()

Delete

↑

MEAN(numexpr,numexpr[...]). Numeric. Returns the arithmetic mean of its arguments that have valid, nonmissing values. This function requires two or more arguments, which must be numeric. You can specify a minimum number of valid arguments for this function to be evaluated.

If... (optional case selection condition)

OK

Paste

Reset

Cancel

Help

Function group:

Random Numbers
Search
Significance
Statistical
Scoring
String
Time Duration Creation

Functions and Special Variables:

Cfvar
Max
Mean
Median
Min
Sd
Sum
Variance

SQ1
3
4
3
2
2
4
1
2
2
3
1
4
2
2
4
2
3
3
4
3
4
2
4

10

A1	A2	A3
4	4	
4	4	
3	2	
1	3	
2	2	
3	4	
2	3	
2	3	
5	5	
4	3	
5	4	
5	5	
5	5	
4	5	
3	2	
2	2	
4	2	
4	4	
4	4	
1	4	
4	4	
5	5	
4	4	
5	5	

Target Variable:

HPWSs

Type & Label...

- A1
- A2
- A3
- M1
- M2
- M3
- M4
- M5
- O1
- O2
- O3
- O4
- SQ1
- SQ2
- SQ3
- SQ4
- SQ5
- SQ6
- SQ7

Numeric Expression:

MEAN(A1, A2)

+	<	>	7	8	9
-	<=	>=	4	5	6
*	=	~=	1	2	3
/	&		0	.	
**	~	()	Delete		

MEAN(numexpr,numexpr[...]). Numeric. Returns the arithmetic mean of its arguments that have valid, nonmissing values. This function requires two or more arguments, which must be numeric. You can specify a minimum number of valid arguments for this function to be evaluated.

If... (optional case selection condition)

Function group:

- Random Numbers
- Search
- Significance
- Statistical
- Scoring
- String
- Time Duration Creation

Functions and Special Variables

- Cfvar
- Max
- Mean
- Median
- Min
- Sd
- Sum
- Variance

OK

Paste

Reset

Cancel

Help

SQ1

- 3
- 4
- 3
- 2
- 2
- 4
- 1
- 2
- 2
- 3
- 1
- 4
- 2
- 2
- 4
- 2
- 3
- 3
- 4
- 3
- 2
- 4

11

	HPWSs	var	var	var
3	4.00			
3	4.00			
3	2.50			
2	2.00			
2	2.00			
4	3.50			
2	2.50			
2	2.50			
4	5.00			
3	3.50			
3	4.50			
4	5.00			
4	5.00			
4	4.50			
3	2.50			
2	2.00			
3	3.00			
4	4.00			
3	2.50			
4	4.00			
5	5.00			
4	4.00			
5	5.00			



12

Descriptive Statistic Analysis

5



Concerning the sample classification, descriptive statistics is calculated to describe the sample.

It represents percentages and frequencies of the sample who participated in the current study and responded to the questionnaire

Also get descriptive to variables

In descriptive analysis, there are 3 ways to be calculated

1st in way descriptive analysis

1. Define descriptive statistics
2. Identify the purposes of descriptive statistics
3. Represent data graphically using SPSS
4. Compute the Descriptive analysis using SPSS

Statistics is concerned with the scientific method by which information is collected, organized, analyzed and interpreted for the purpose of description and decision making.

Descriptive statistics one of the statistics types which describe the basic features of the data in a study. They provide simple summaries about the sample and the measures. Together with simple graphics analysis, they form the basis of virtually every quantitative analysis of data. Descriptive statistics you are simply describing what is or what the data shows.

Univariate analysis involves describing the distribution of a single variable, including its central tendency (including the mean, median, and mode) and dispersion (including the range and quantiles of the data-set, and measures of spread such as the variance and standard deviation).

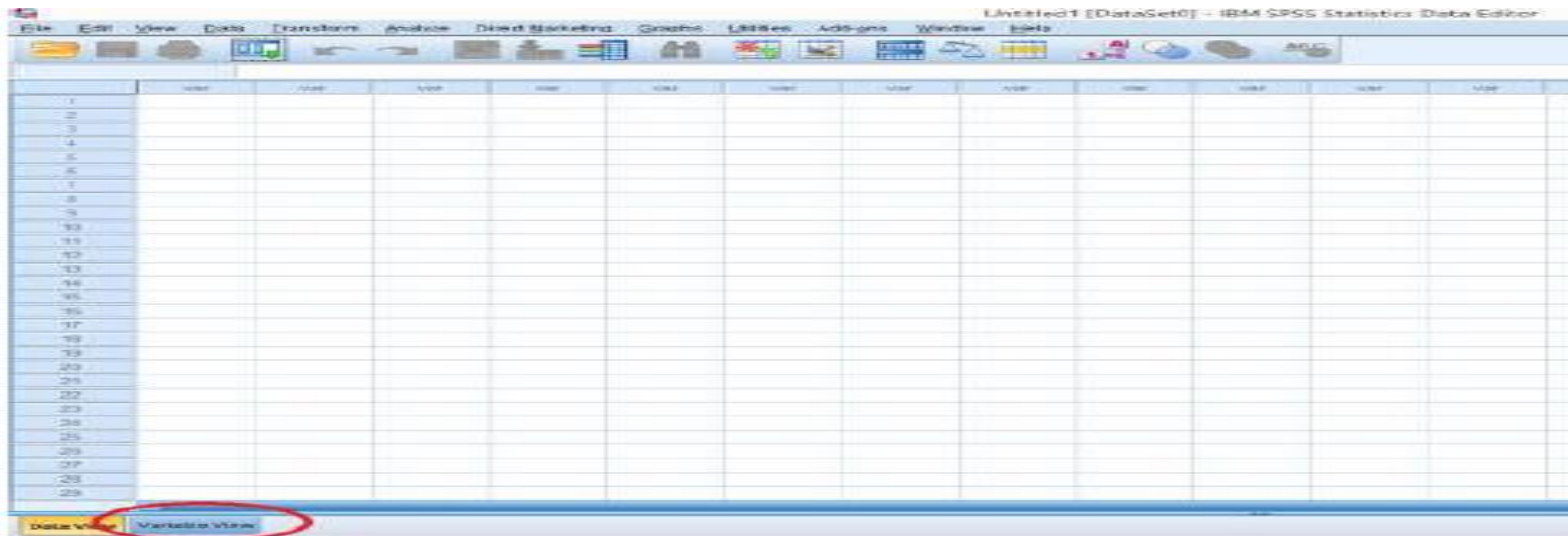
Here, we will show how to compute the descriptive statistics using SPSS Version 20.

Data Entry:

Gender	Age	BLS Exam	ACLS Exam
Male	25	84	100
Male	24	88	92
Female	30	84	92
Female	25	84	100
Female	27	88	84
Male	30	92	76
Male	30	92	80
Female	32	88	84
Male	29	100	84
Female	31	100	88
Female	26	88	88
Female	29	84	88
Male	29	74	92
Male	31	70	88
Male	25	82	92
Female	27	82	94
Male	27	84	96
Female	34	84	100
Female	33	88	84
Female	25	92	84

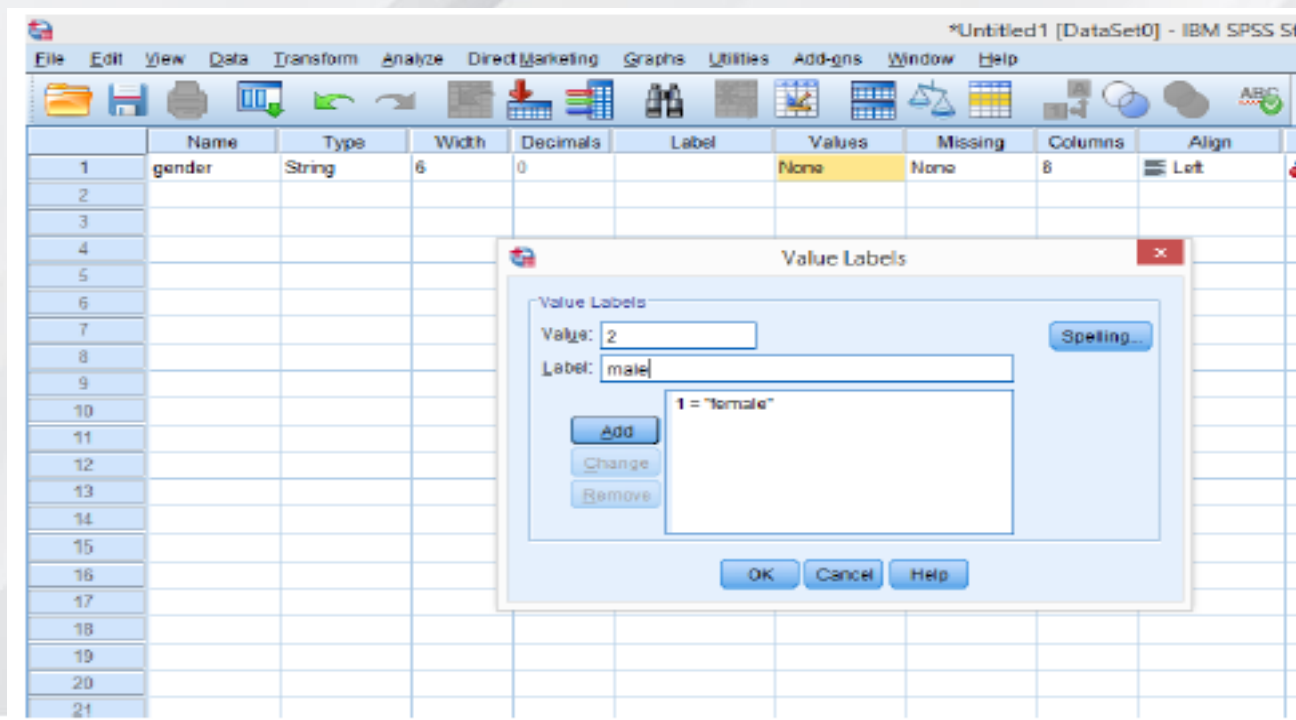
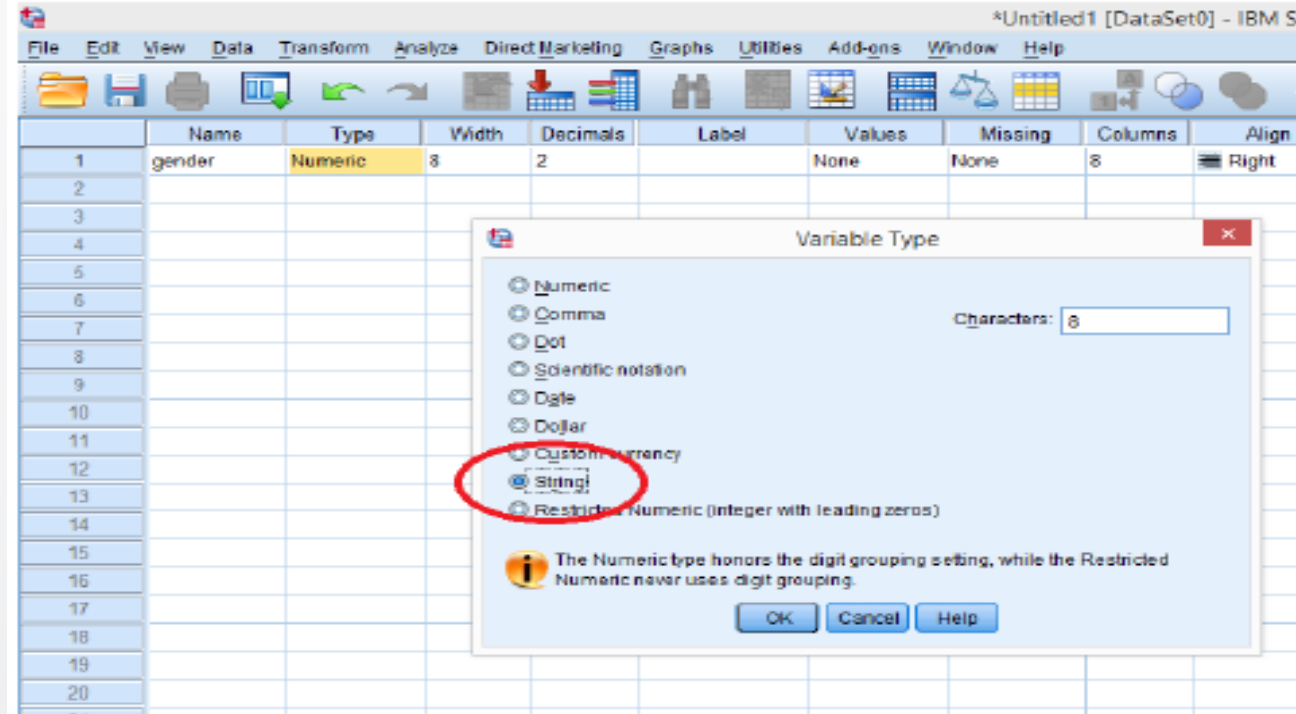
- To perform descriptive analysis on the above data using SPSS program, we need to enter the data there. This can be done by opening a blank sheet of SPSS and choose the variable view.

- The variable view is used to define the variables. Each variable is represented as a row, and various properties of the variable are represented as columns, allowing us to change the properties of existing variables or establish properties for new variables



For the gender:

- Name: gender
- Type: choose 'string' as the gender holds text character.
- Width: can be "6" as the word "female" has 6 letters and "male" is 4 letters only.
- Decimal: There is no decimal for the string.
- Label: You can label it by writing "gender"
- Values: label "female" for value "1" and "male" for value "2" as shown in the picture.
- Missing: to know what to enter if there was an absent data instead of keeping it empty. So, we will write "99".
- Columns: the width of column on the data view
- Align: the Alignment on the data view
- Measures: choose nominal as the gender is nominal and not ordinal.



- Age:
 - Name: Age
 - Type: choose 'numerical' as the age is numbers.
 - Width: can be "2" as the maximum digits we can use it for age is 2.
 - Decimal: put it "0" as we want to use an integer number for the age.
 - Label: You can label it by writing "age"
 - Values: no need to label it.
 - Missing: to know what to enter if there was an absent data instead of keeping it empty. So, we will write "99".
 - Columns: the width of column on the data view
 - Align: the Alignment on the data view
 - Measures: choose scale as the age is different numbers.
 - Role: keep it input, as the age is an input variable
- Enter the BLS and ACLS exams variable the same as we did in age variable and as shown in the picture.

SPSS Statistics Data Editor

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	gender	String	6	0	gender	(1, female)	99	8	Left	Nominal	Input
2	age	Numeric	2	0	age	None	99	8	Right	Scale	Input
3	BLS	Numeric	2	0	BLS exam	None	99	8	Right	Scale	Input
4	ACLS	Numeric	2	0	ACLS exam	None	99	8	Right	Scale	Input
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											

Data View Variable View

- Then, on the data view to enter the data.

SPSS Interface: *Untitled1 [DataSet0] - IBM SPSS Sta

File Edit View Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help

21 : ACLS

	gender	age	BLS	ACLS	var	var	var	var	var	var
1	2	25	84	100						
2	2	24	88	92						
3	1	30	84	92						
4	1	25	84	100						
5	1	27	88	84						
6	2	30	92	76						
7	2	30	92	80						
8	1	32	88	84						
9	2	29	100	84						
10	1	31	100	88						
11	1	26	88	88						
12	1	29	84	88						
13	2	29	74	92						
14	2	31	70	88						
15	2	25	82	92						
16	1	27	82	94						
17	2	27	84	96						
18	1	34	84	100						
19	1	33	88	84						
20	1	25	92	84						
21										
22										
23										
24										
25										
26										
27										
28										
29										

1

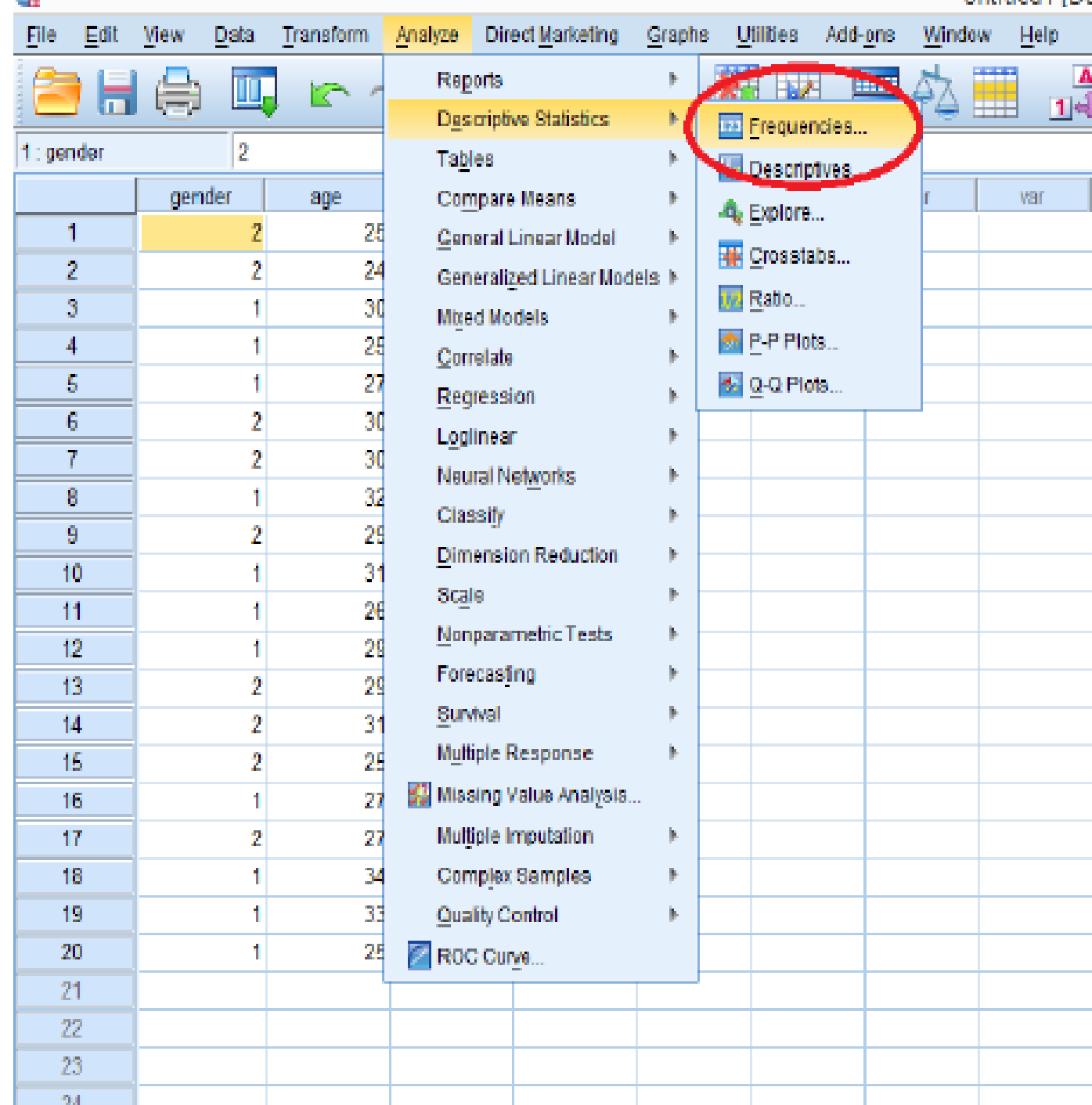
Data View Variable View

Calculating the frequencies, Mean, Median, Mode, Standard Deviation, Variance, Range, and Quartiles:

- To perform descriptive analysis:

- We have to know that there are two types of variables, categorical and continuous.
 - Categorical variable we can find n, the percentage, and the bar chart.
 - Continuous we can find n, mean, median, mode, standard deviation, variance, minimum, maximum, range, quartiles, and histogram.
- **Note:** If we try to take the standard deviation for the gender, the output sheet won't give you any reading.
- So, the menu bar is used to click on:

"Analysis" ➡ "descriptive statistics" ➡ "frequencies"



• In the "frequencies: statistics" pop-up box choose which measurements you want to perform. Like central tendency and dispersion. Then click continue button and that will take you to the frequencies pop-up window.

The screenshot shows the SPSS Data Editor window with a dataset containing 20 rows and 14 columns. The columns are labeled: gender, age, BLS, ACIS, and 11 columns labeled '1' through '11'. The data is as follows:

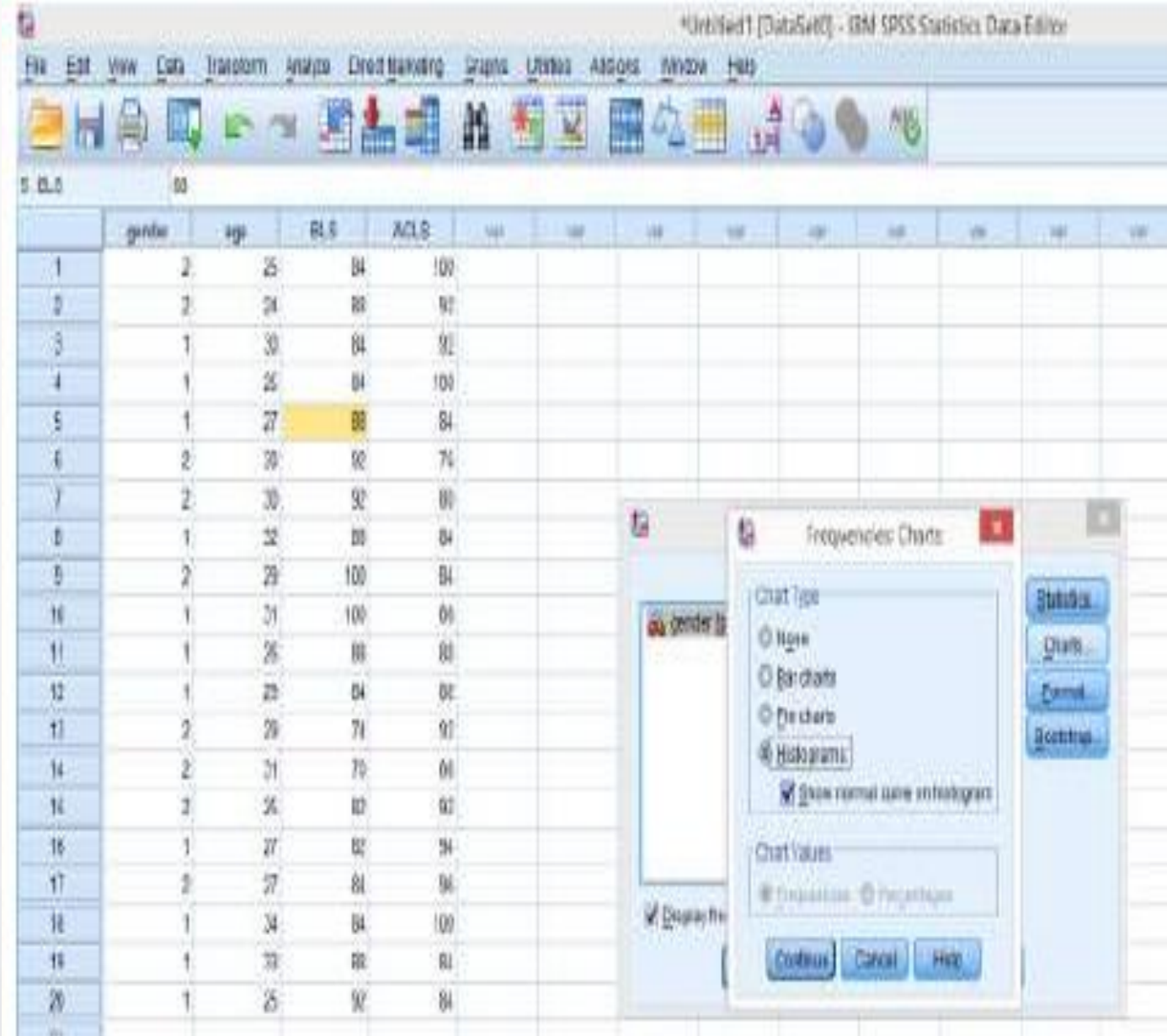
	gender	age	BLS	ACIS	1	2	3	4	5	6	7	8	9
1	2	25	14	100									
2	2	24	10	12									
3	1	30	14	12									
4	1	25	14	100									
5	1	27	18	14									
6	2	30	12	16									
7	2	30	12	10									
8	1	32	18	14									
9	2	29	110	14									
10	1	31	110	18									
11	1	26	10	10									
12	1	29	14	10									
13	2	29	14	12									
14	2	31	10	10									
15	2	25	12	12									
16	1	27	12	14									
17	2	27	14	16									
18	1	34	14	100									
19	1	33	10	14									
20	1	26	12	14									
21													
22													

The 'Frequencies: Statistics' dialog box is open, showing the following options:

- Percentile values:** ☐ Quartiles, ☐ Octants for: 11 equal groups, ☐ Percentiles. Buttons: OK, Change, Cancel.
- Central tendency:** ☒ Mean, ☒ Median, ☒ Mode, ☒ Sum.
- Dispersion:** ☒ Std. deviation, ☐ Mean, ☒ Variance, ☐ Maximum, ☒ Range, ☐ S.E. mean.
- Distribution:** ☐ Skewness, ☐ Kurtosis.
- ☐ Values are group midpoints.
- Buttons: Continue, Cancel, Help.

• In the "frequencies: charts" pop-up box select histogram for the ACLS, BLS, and the age then click continue.

- Note: if you select the variable gender you can't get any histogram for that.
- To see the normal curve, you can click on 'show the normal curve on histogram'.



- On the output sheet, we can see the frequency tables and the histograms of the chosen variables.

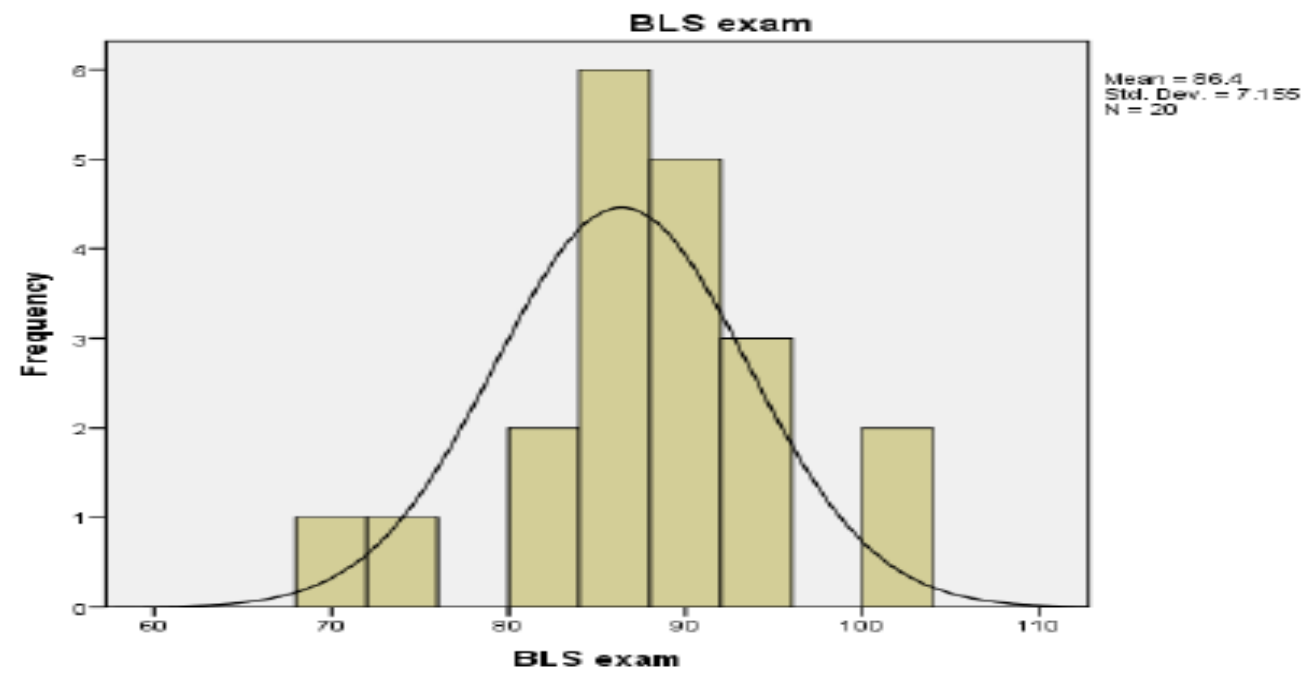
ACLS exam

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	76	1	5.0	5.0	5.0
	80	1	5.0	5.0	10.0
	84	5	25.0	25.0	35.0
	88	4	20.0	20.0	55.0
	92	4	20.0	20.0	75.0
	94	1	5.0	5.0	80.0
	96	1	5.0	5.0	85.0
	100	3	15.0	15.0	100.0
Total		20	100.0	100.0	

age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	24	1	5.0	5.0	5.0
	25	4	20.0	20.0	25.0
	26	1	5.0	5.0	30.0
	27	3	15.0	15.0	45.0
	29	3	15.0	15.0	60.0
	30	3	15.0	15.0	75.0
	31	2	10.0	10.0	85.0
	32	1	5.0	5.0	90.0
	33	1	5.0	5.0	95.0
	34	1	5.0	5.0	100.0
Total		20	100.0	100.0	

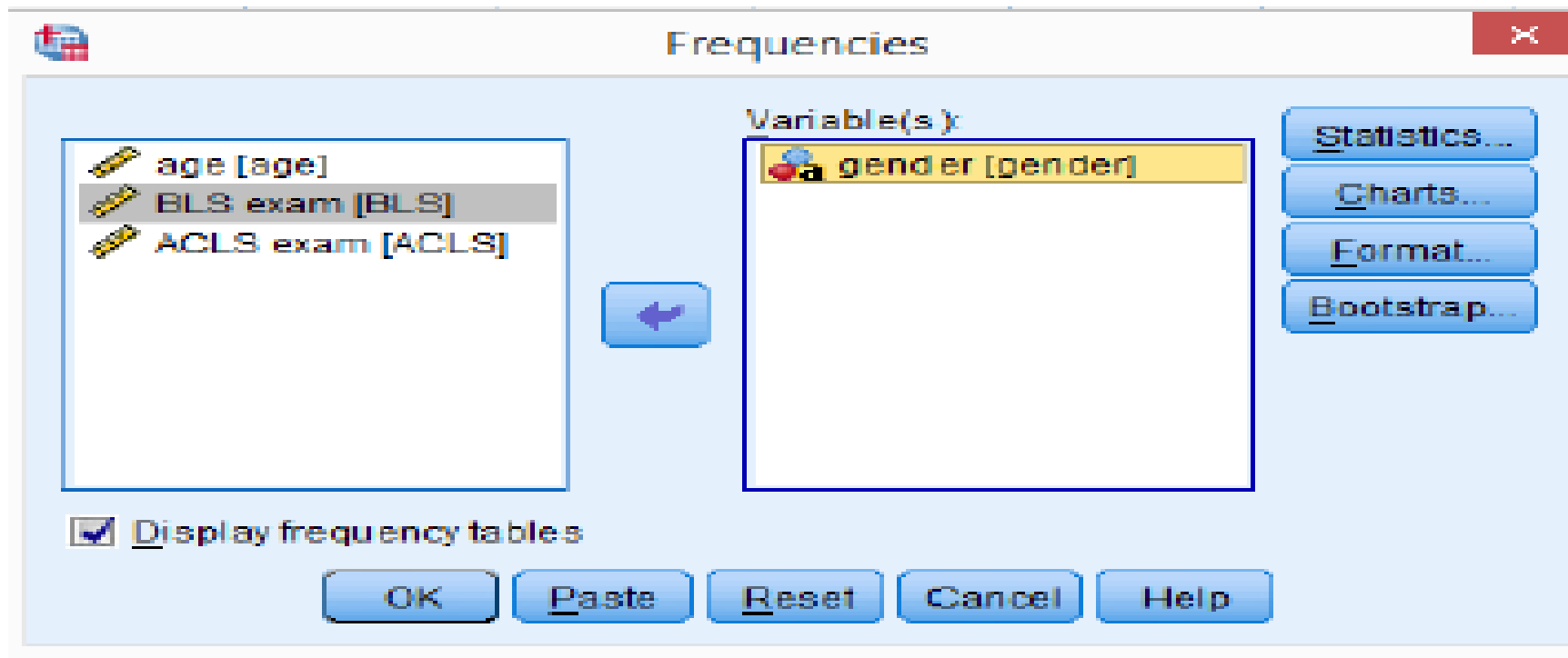
Histogram



- For the bar chart, by doing the same steps.

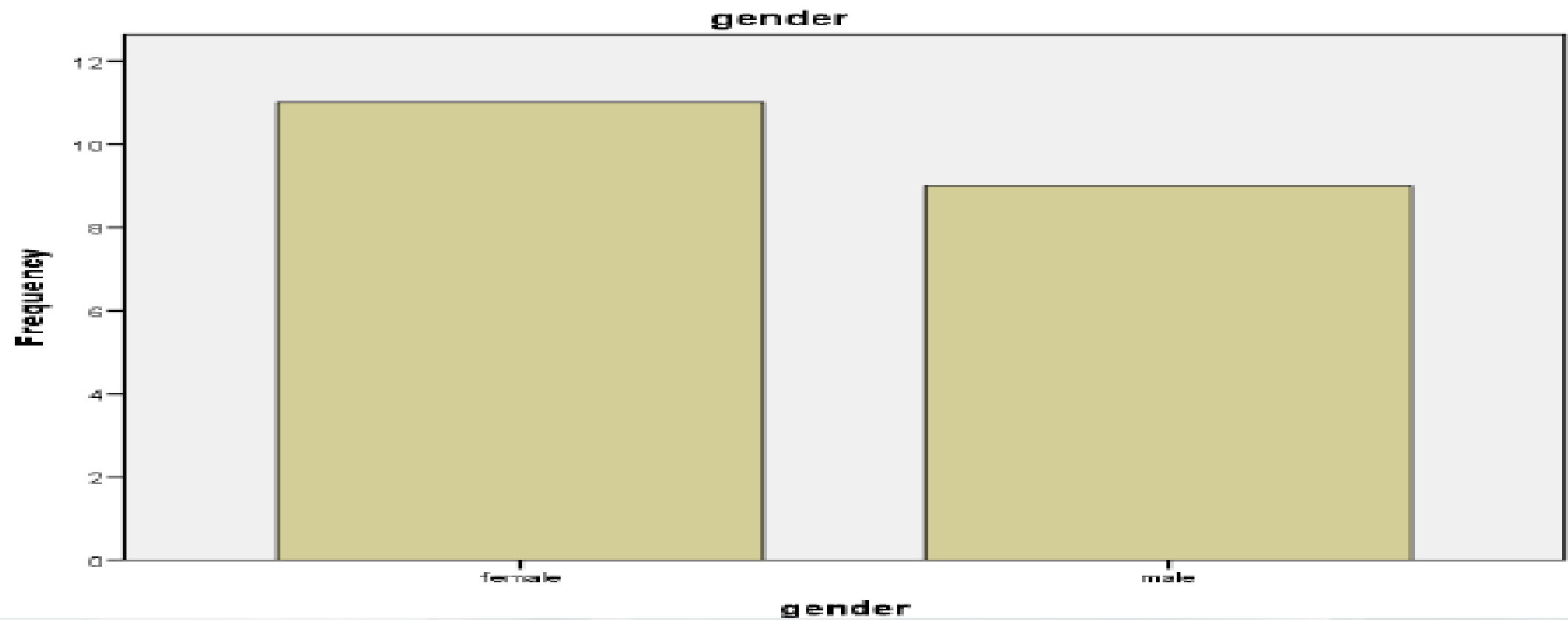
“Analysis” → “descriptive statistics” → “frequencies”

- Then choose the variable “gender” and click on charts to choose the bar chart.



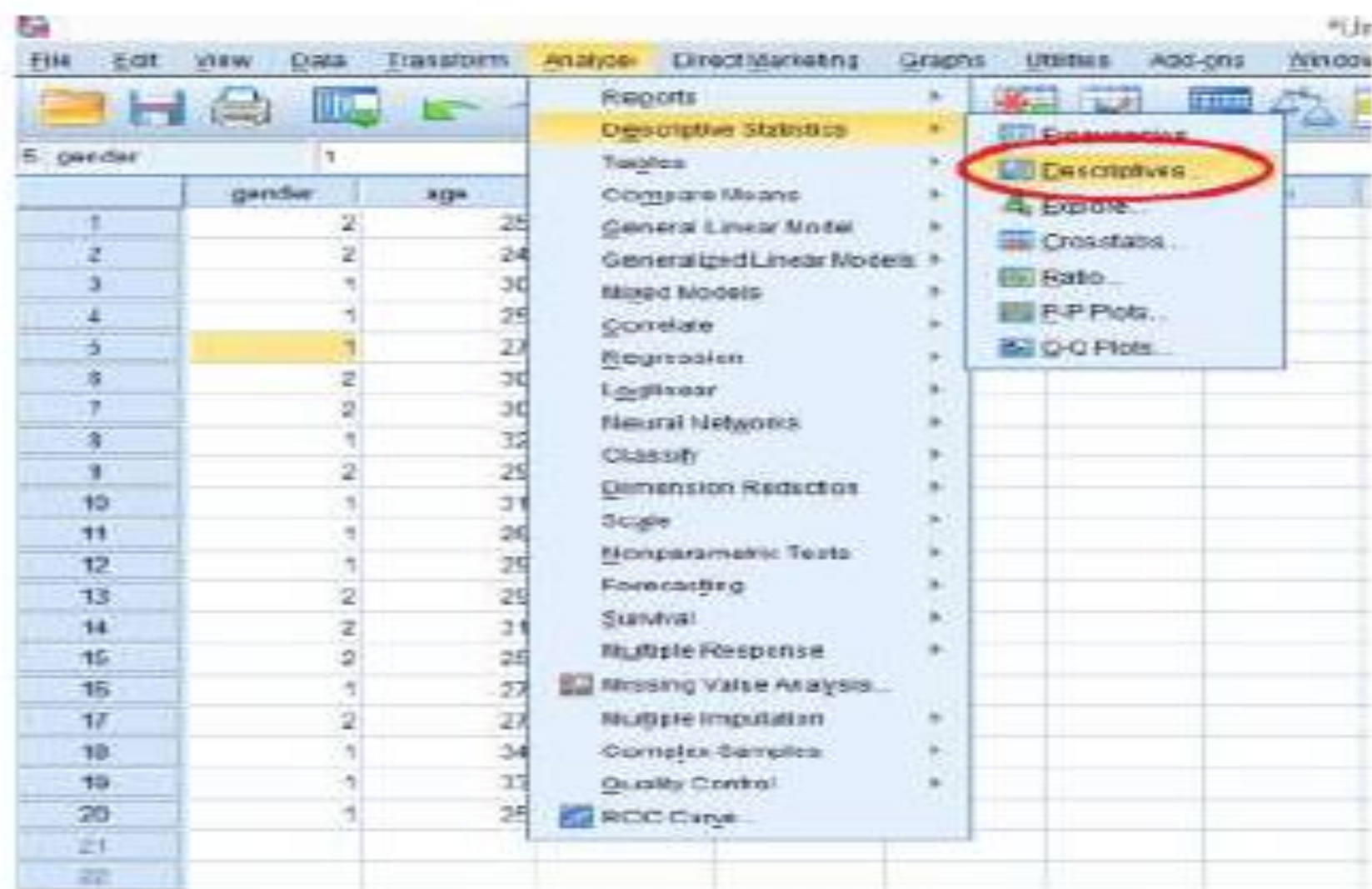
- Then it will show the frequency table and the bar chart on the output sheet:

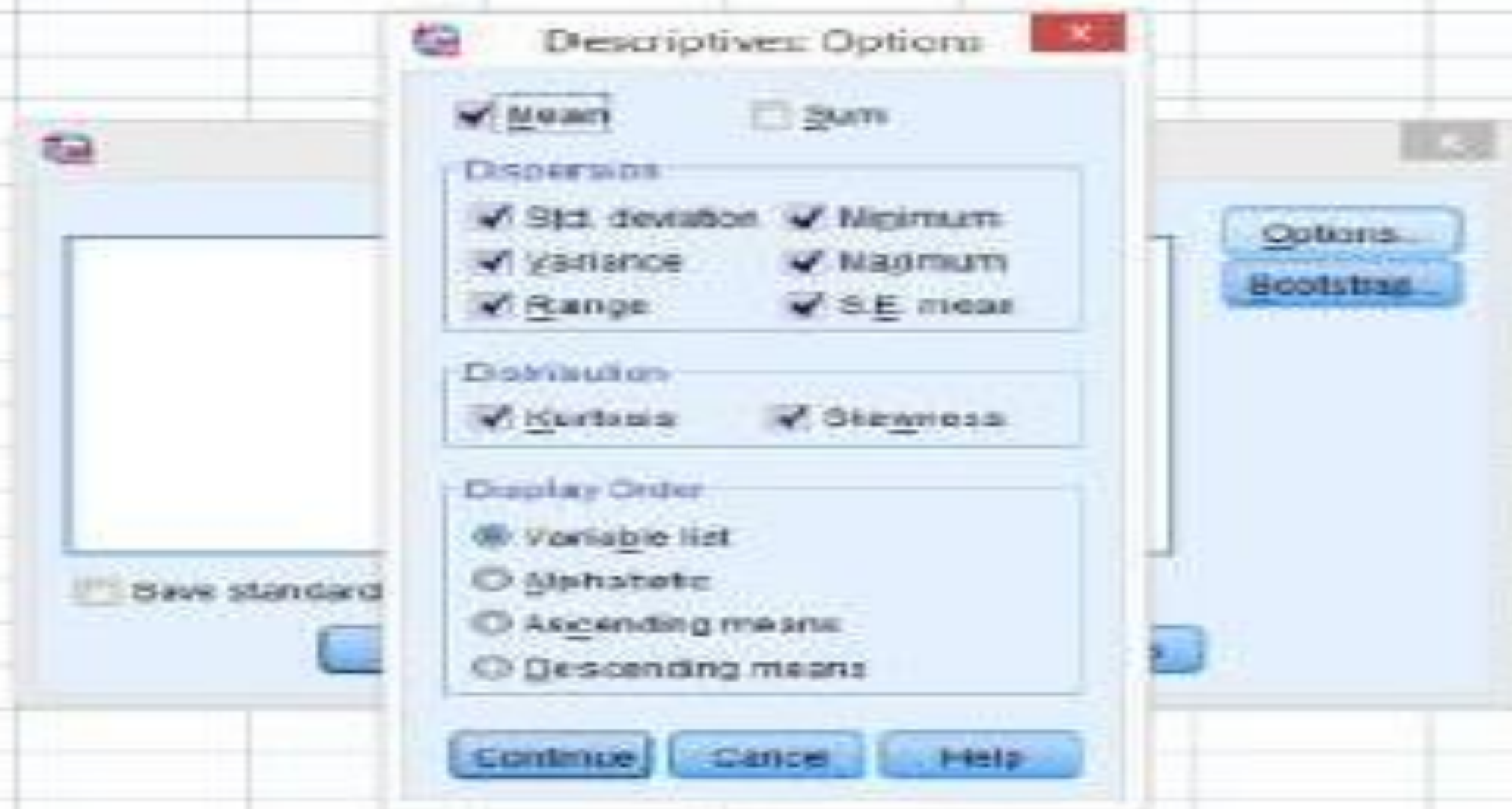
		gender			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	female	11	55.0	55.0	55.0
	male	9	45.0	45.0	100.0
	Total	20	100.0	100.0	



2nd way of descriptive analysis

- Another way to perform a descriptive analysis is to click on Analyze > Descriptive statistics > Descriptives. Choose the variables then click on options





- On the output sheet, we can find the results as following

Descriptives

[DataSet0]

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
age	20	10	24	34	28.45	.659	2.946	8.682	.179	.512	-1.003	.992
BL8 exam	20	30	70	100	86.40	1.600	7.155	51.200	-.158	.512	1.100	.992
ACL8 exam	20	24	76	100	89.30	1.496	6.689	44.747	.048	.512	-.481	.992
Valid N (listwise)	20											

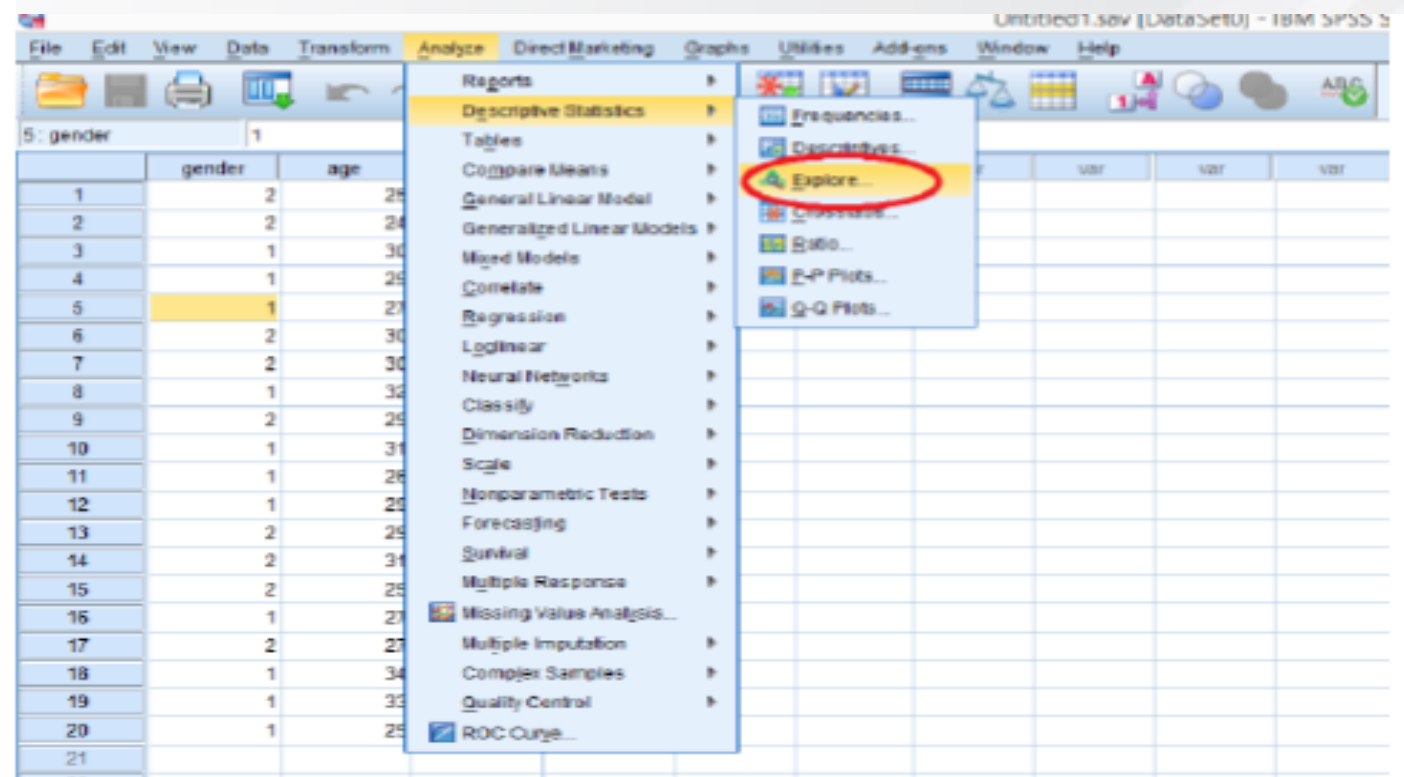
```
DESCRIPTIVES VARIABLES=age BL8 ACL8
```

```
  /STATISTICS=MEAN STDDEV VARIANCE RANGE MIN MAX Semean KURTOSIS SKEWNESS.
```

3rd way to find descriptive analysis

- The third way to find descriptive statistics:

- In the menu bar click on "analyze"
- Select "descriptive statistics"
- Select "explore"
- Arrange the variables as dependent and factor.
- click **OK** to have the output



Descriptives

Use Variable Sets

	gender		Statistic	Std. Error
BLS exam	female	Mean	87.45	1.528
		95% Confidence Interval for Mean	Lower Bound 84.05 Upper Bound 90.86	
		5% Trimmed Mean	87.06	
		Median	88.00	
		Variance	25.673	
		Std. Deviation	5.067	
		Minimum	82	
		Maximum	100	
		Range	18	
		Interquartile Range	4	
		Skewness	1.637	.661
		Kurtosis	3.247	1.279
	male	Mean	85.11	3.093
		95% Confidence Interval for Mean	Lower Bound 77.98 Upper Bound 92.24	
		5% Trimmed Mean	85.12	
		Median	84.00	
		Variance	86.111	
		Std. Deviation	9.280	
		Minimum	70	
		Maximum	100	
		Range	30	
		Interquartile Range	14	
		Skewness	-.176-	.717
		Kurtosis	-.193-	1.400

Examples

1st Method



native_Commi... 2.2

Organization

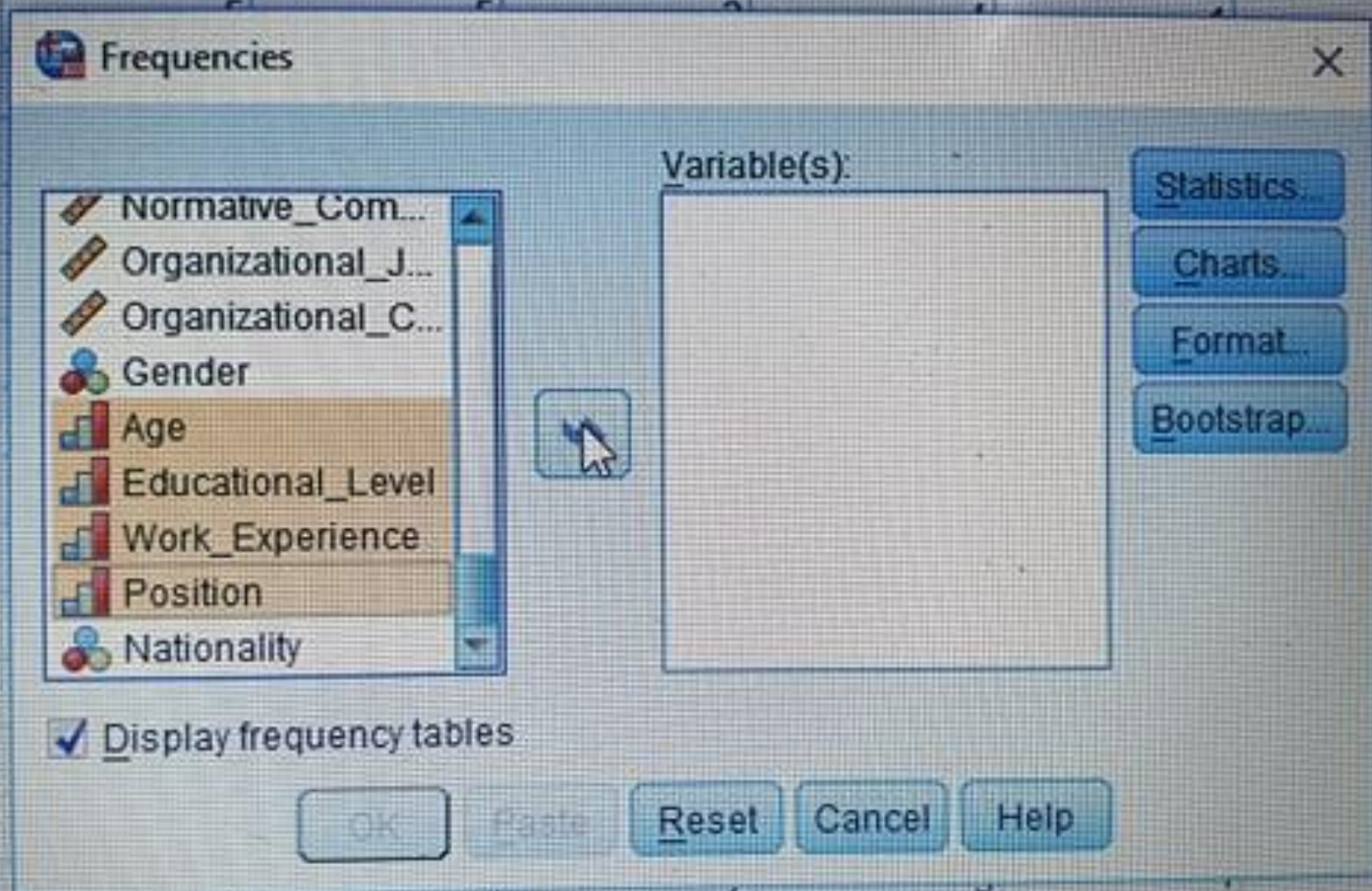
- Reports
- Descriptive Statistics
- Tables
- Compare Means
- General Linear Model
- Generalized Linear Models
- Mixed Models
- Correlate
- Regression
- Loglinear
- Neural Networks
- Classify
- Dimension Reduction
- Scale
- Nonparametric Tests
- Forecasting
- Survival
- Multiple Response
- Missing Value Analysis
- Multiple Imputation
- Complex Samples
- Quality Control
- ROC Curve
- IBM SPSS Amos



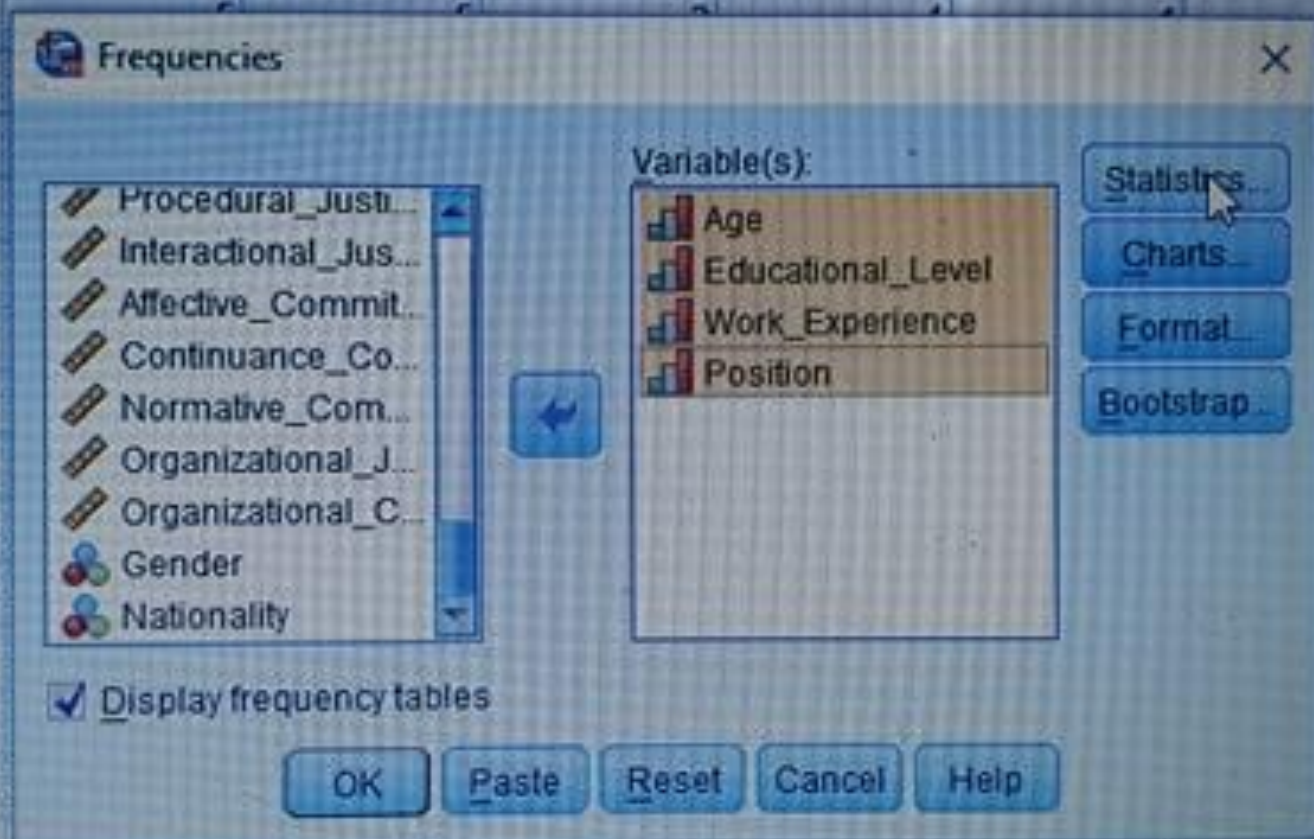
- Frequencies...
- Descriptives...
- Explore...
- Crosstabs...
- Ratio...
- P-P Plots...
- Q-Q Plots...

national	Work_Experience	Position	Nationality	var	var	var	var
2	3	2	1				
2	4	2	1				
5	3	4	1				
2	3	2	1				
2	2	4	1				
2	5	5	4	1			
1	2	3	2	1			
1	1	4	3	2	1		
2	3	4	3	3	1		
2	1	1	3	4	1		
2	3	3	3	4	1		
2	4	4	3	2	1		
2	1	1	1	1	1		
1	4	4	3	3	1		
2	3	4	2	3	1		
1	3	3	2	3	1		
2	2	3	1	2	1		
1	2	3	1	2	1		
2	3	1	1	1	1		
1	2	3	1	2	1		
2	4	5	4	4	1		

1



2



3

Frequencies: Statistics

Percentile Values

☐ Quartiles

☐ Cut points for: 10 equal groups

☐ Percentile(s):

Add

Change

Remove

Central Tendency

☒ Mean

☒ Median

☒ Mode

☒ Sum

☐ Values are group midpoints

Dispersion

☒ Std. deviation ☐ Minimum

☒ Variance ☐ Maximum

☒ Range ☐ S.E. mean

Distribution

☐ Skewness

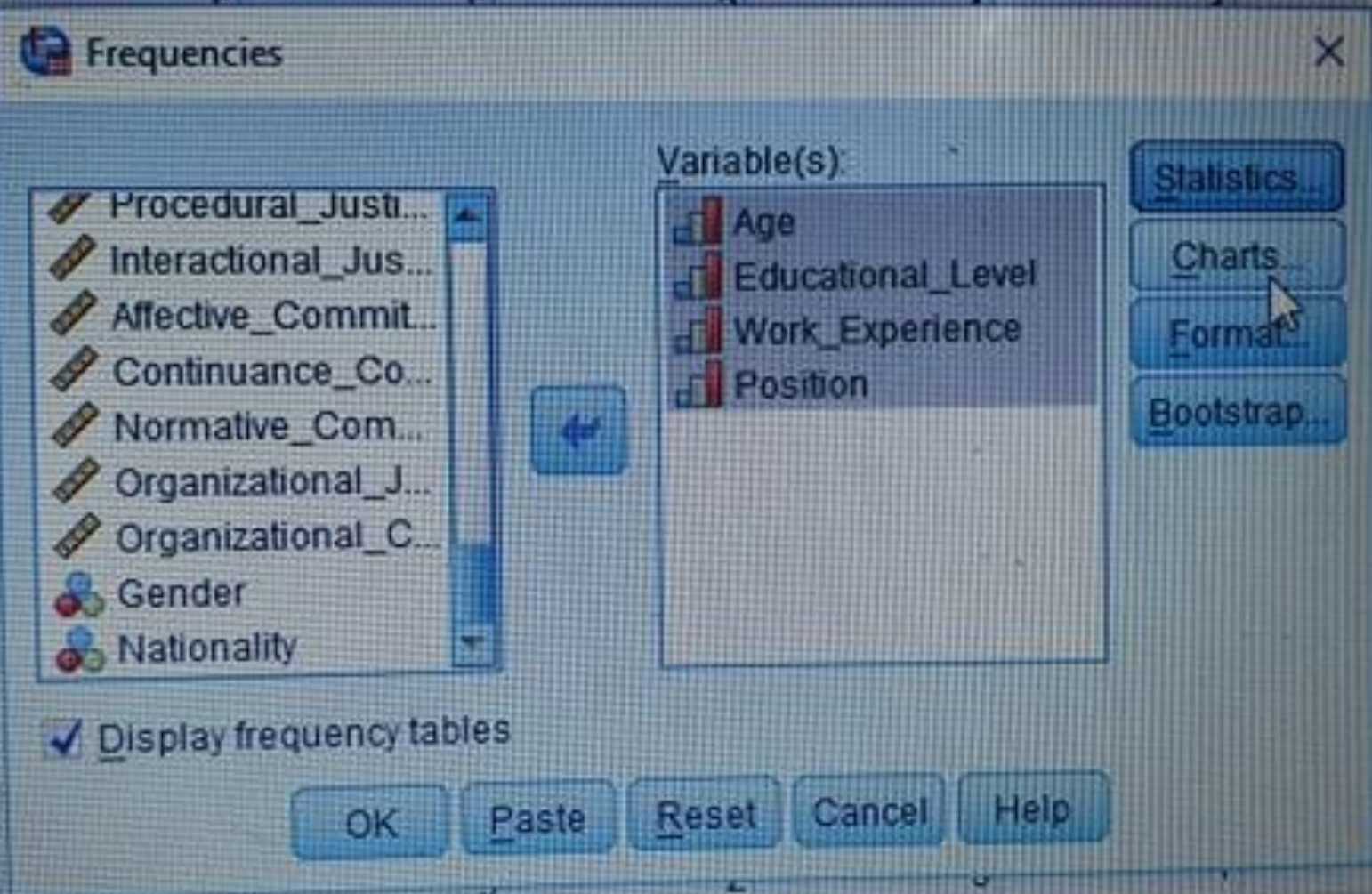
☐ Kurtosis

Continue

Cancel

Help

4



5

Frequencies

- ☒ Procedural
- ☒ Interactional
- ☒ Affective_C
- ☒ Continuanc
- ☒ Normative_
- ☒ Organizatio
- ☒ Organizatio
- ☒ Gender
- ☒ Nationality

☒ Display frequ

Frequencies: Charts

Chart Type

- ☐ None
- ☐ Bar charts
- ☐ Pie charts
- ☒ Histograms:

☒ Show normal curve on histogram

Chart Values

☒ Frequencies ☐ Percentages

Continue

Cancel

Help

Statistics...

Charts...

Format...

Bootstrap...

6

Frequency Table

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 20	11	7.4	7.4	7.4
	20-29	48	32.4	32.4	39.9
	30-39	54	36.5	36.5	76.4
	40-49	29	19.6	19.6	95.9
	50 above	6	4.1	4.1	100.0
	Total	148	100.0	100.0	

Educational_Level

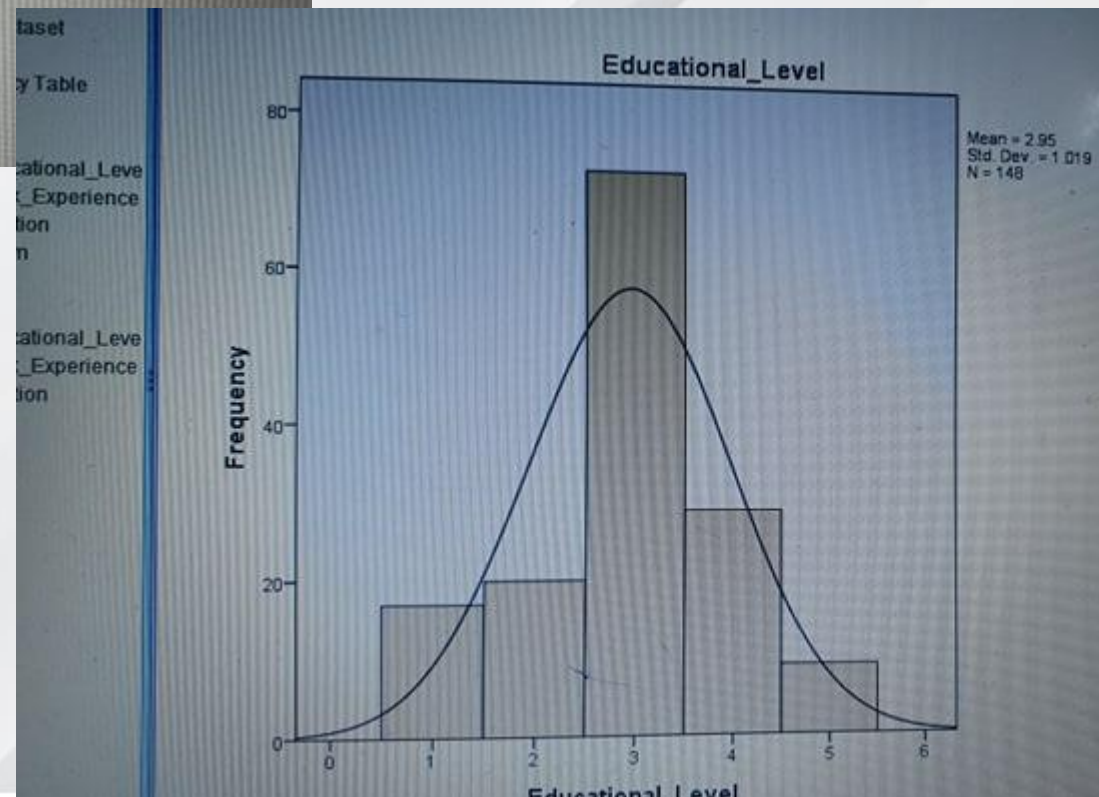
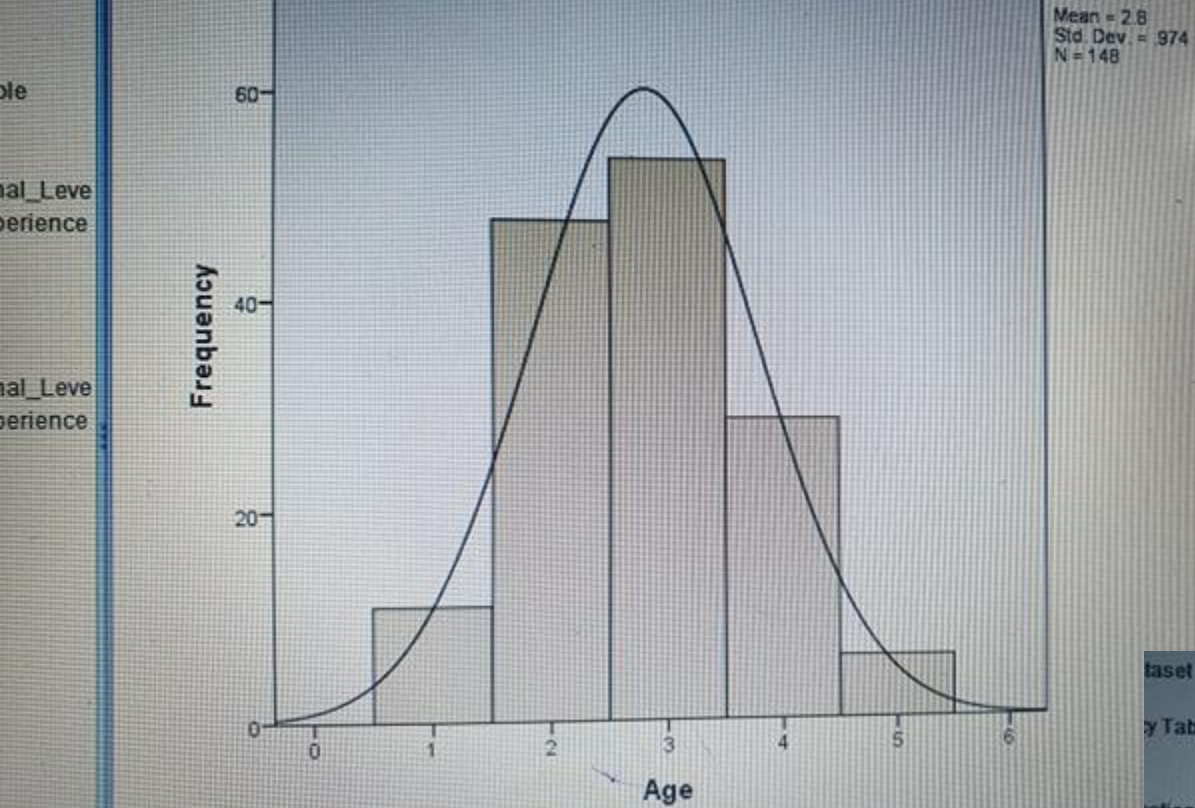
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High School	17	11.5	11.5	11.5
	Diploma	20	13.5	13.5	25.0
	University Degree	73	49.3	49.3	74.3
	Master	29	19.6	19.6	93.9
	Ph.D/DBA	9	6.1	6.1	100.0
	Total	148	100.0	100.0	

Work_Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2-5 years	40	27.0	27.0	27.0
	6-10 years	44	29.7	29.7	56.8
	10-15 years	41	27.7	27.7	84.5
	More than 15 years	23	15.5	15.5	100.0
	Total	148	100.0	100.0	

Position

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Entry level employee	30	20.3	20.3	20.3
	Junior employee	53	35.8	35.8	56.1
	Senior employee	48	32.4	32.4	88.5
	Senior executive employee	17	11.5	11.5	100.0
	Total	148	100.0	100.0	



2nd Method

Educational_Commitment	Gender	Age	Educational_Level	Work_Experience	Position	Nationality	var	var	var	var
5	2	4	2	3	2	1				
5	2	3	2	4	2	1				
5	2	5	5	3	1	1				
5	2									
5	2									
5	2									
5	2									
5	1									
5	1									
5	2									
5	2									
5	2									
5	2									
5	2									
5	2									
5	1									
5	2									
5	2									
3	1									
2	2	2	3	1	2	1				
2	1	2	3	1	2	1				
5	2	3	1	1	1	1				
3	1	2	3	1	2	1				
3	2	4	5	4	4	1				
3	1	4	4	4	3	1				

Descriptives
✕

Procedural_Justi...
 Interactional_Jus...
 Affective_Commit...
 Continuance_Co...
 Normative_Com...
 Organizational_J...
 Organizational_C...
 Gender
 Nationality

➡

Variable(s):

Age
 Educational_Level
 Work_Experience
 Position

Options...

Bootstrap...

☐ Save standardized values as variables

OK

Paste

Reset

Cancel

Help

1

Descriptives

DJ1

DJ2

DJ3

DJ4

DJ5

PJ1

PJ2

PJ3

PJ4

☐ Save standardized residuals

Descriptives: Options

☒ Mean ☐ Sum

Dispersion

☒ Std. deviation ☒ Minimum

☒ Variance ☒ Maximum

☒ Range ☒ S.E. mean

Distribution

☐ Kurtosis ☐ Skewness

Display Order

☒ Variable list

☐ Alphabetical

☐ Ascending means

☐ Descending means

Continue Cancel Help

Options...

Bootstrap...

2

al_Commitment	Gender	Age	Educational_Level	Work_Experience	Position	Nationality	var	var	var
5	2	4	2	3	2	1			
5	2	3	2	4	2	1			
5	2	5	5	3	1	1			
5	2								
5	2								
5	2								
5	2								
5	1								
5	1								
5	2								
5	2								
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5	2								
5	2								
5	2								
5	1								
5	2								
3	1								
2	2	2	3	1	2	1			
2	1	2	3	1	2	1			
5	2	3	1	1	1	1			

Descriptives
✕

Procedural_Justi...
 Interactional_Jus...
 Affective_Commit...
 Continuance_Co...
 Normative_Com...
 Organizational_J...
 Organizational_C...
 Gender
 Nationality

➡

Variable(s):

Age
 Educational_Level
 Work_Experience
 Position

Options...

Bootstrap...

☐ Save standardized values as variables

➡

OK

Paste

Reset

Cancel

Help

3

DESCRIPTIVES VARIABLES=Age Educational_Level Work_Experience Position
/STATISTICS=MEAN STDDEV VARIANCE RANGE MIN MAX SEMEAN.

→ Descriptives

[DataSet2] F:\My Private Course\RM L 8\SPSS DATA .sav

4

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Age	148	4	1	5	2.80	.080	.974	.948
Educational_Level	148	4	1	5	2.95	.084	1.019	1.039
Work_Experience	148	3	1	4	2.32	.085	1.037	1.075
Position	148	3	1	4	2.35	.077	.932	.869
Valid N (listwise)	148							

3rd Method

Data Transform Analyze Direct Marketing Graphs Utilities Add-ons Window Help



mmi... 2.2

Organization

5

5

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4

4

Reports

Descriptive Statistics

Tables

Compare Means

General Linear Model

Generalized Linear Models

Mixed Models

Correlate

Regression

Loglinear

Neural Networks

Classify

Dimension Reduction

Scale

Nonparametric Tests

Forecasting

Survival

123 Frequencies...

PC Descriptives...

Explore...

Crosstabs...

1/2 Ratio...

P-P Plots...

Q-Q Plots...

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Work_Experi
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Position

Nationality

var

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Explore



- NC5
- Distributive_Justi...
- Procedural_Justi...
- Interactional_Jus...
- Affective_Commit...
- Continuance_Co...
- Normative_Com...
- Organizational_J...
- Organizational_C...



Dependent List

- Age
- Educational_Level
- Work_Experience

Factor List:

- Gender
- Nationality

Label Cases by:

Statistics...

Plots...

Options...

Bootstrap...

Display

☒ Both ☐ Statistics ☐ Plots

OK

Paste

Reset

Cancel

Help

2

Explore

NC5
Distributive_Justi...
Procedural_Justi...
Interactional_Jus...
Affective_Commit...
Continuance_Co...
Normative_Com...
Organizational_J...
Organizational_C...

Dependent List

Age
Educational_Level
Work_Experience

Factor List

Gender
Nationality

Label Cases by:

Display

☒ Both ☐ Statistics ☐ Plots

OK

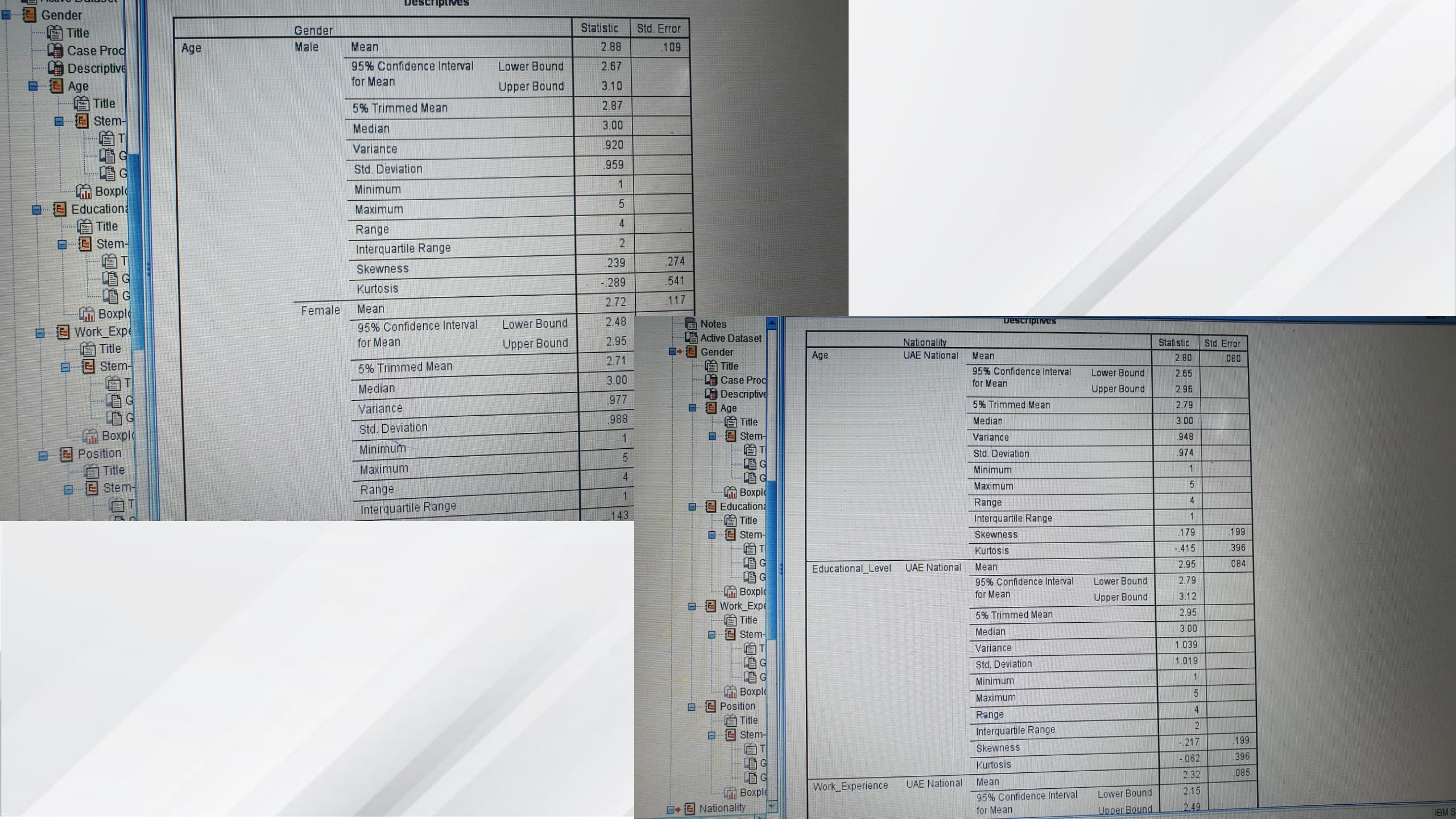
Paste

Reset

Cancel

Help

3



4th Method



ormative_Commi... 2.2

Organization

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5

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4

Reports

Descriptive Statistics

Tables

Compare Means

General Linear Model

Generalized Linear Models

Mixed Models

Correlate

Regression

Loglinear

Neural Networks

Classify

Dimension Reduction

Scale

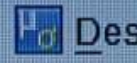
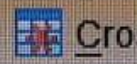
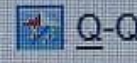
Nonparametric Tests

Forecasting

Survival

Multiple Response

Missing Value Analysis

123 Frequencies...P Descriptives...Explore...Crosstabs...Ratio...P-P Plots...Q-Q Plots...

2

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1

	Gender	Age	Educational_Level	Work_Experience	Position	Nationality	var	var	var
--	--------	-----	-------------------	-----------------	----------	-------------	-----	-----	-----

Crosstabs

Row(s):
Work_Experience

Column(s):
Position

Layer 1 of 1
Previous Next

☒ Display clustered bar charts

☒ Suppress tables

Bootstrap

- NC3
- NC4
- NC5
- Distributive_Justice
- Procedural_Justice
- Interactional_Justice
- Affective_Commitment
- Continuance_Commit...
- Normative_Commitm...
- Organizational_Justice
- Organizational_Com...
- Gender
- Age
- Educational_Level
- Nationality

Row(s):

Work_Experience

Column(s):

Position

Layer 1 of 1

Previous

Next

☐ Display layer variables in table layers☐ Display clustered bar charts☐ Suppress tables

Exact...

Statistics...

Cells...

Format...

Bootstrap...

OK

Paste

Reset

Cancel

Help

3

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Work_Experience * Position	148	100.0%	0	0.0%	148	100.0%

4

Work_Experience * Position Crosstabulation

Count

		Position				Total
		Entry level employee	Junior employee	Senior employee	Senior executive employee	
Work_Experience	2-5 years	20	18	2	0	40
	6-10 years	9	19	13	3	44
	10-15 years	0	14	21	6	41
	More than 15 years	1	2	12	8	23
Total		30	53	48	17	148

Normality Test

6

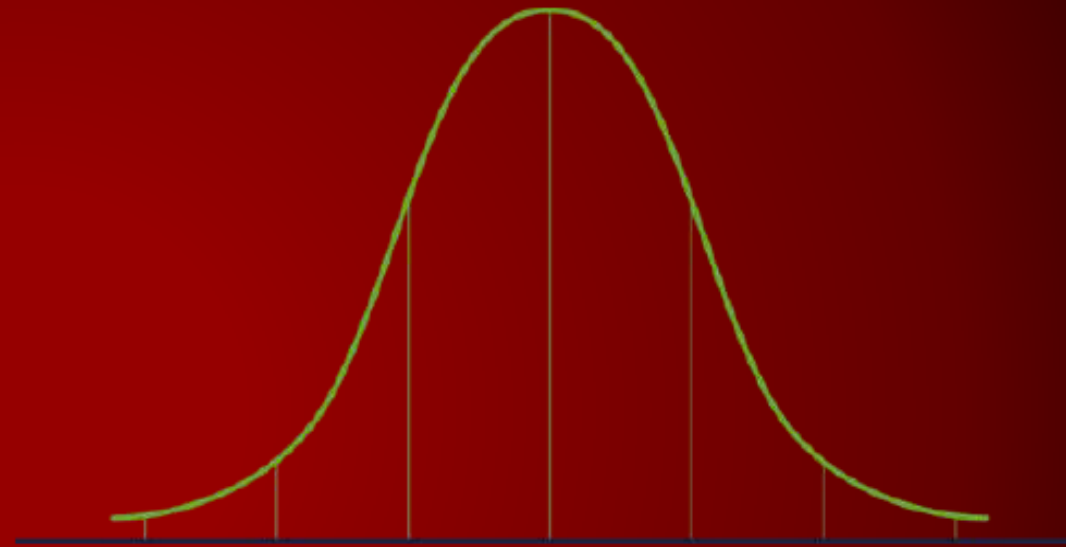


PRE REQUISITE TO DATA ANALYSIS

- Sample Selection: **How was your sample selected from the population ?** Bias selection does not accurately represent the population. Sample should be randomly selected – good estimators of population values
- The measurement scale: **What measurement scale are you using ?** Most of the statistical test of significance require interval data – where the consecutive numbers on the measuring scale are at equal interval.
- The assumption of normality: **Is your data drawn from a normally distributed population ?** Faulty test – then the result may underestimate or overestimate the value of statistics.
- Homogeneity of variance: If comparing two or more samples – then the population from which they are selected should have equal variances.

NORMAL CURVE

- Gaussian Curve
- Smooth Bell Shaped
- Perfectly symmetrical
- Mean = 0
- Standard deviation = 1
- Mean, Median, Mode all coincide
- Based on an infinitely large number of observations – tails never touch baseline



NORMALITY TEST USING SPSS

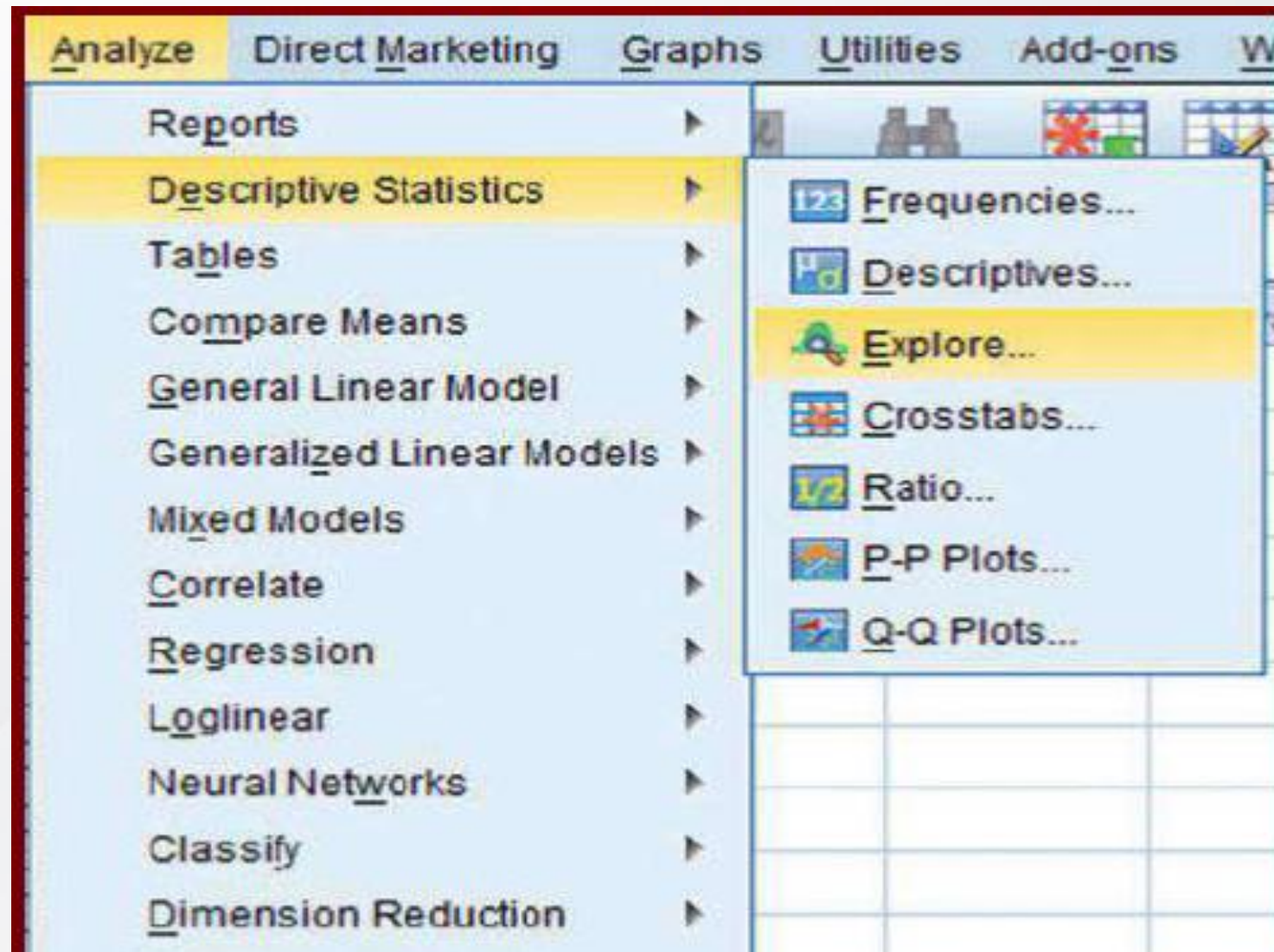
The following numerical and visual outputs must be investigated

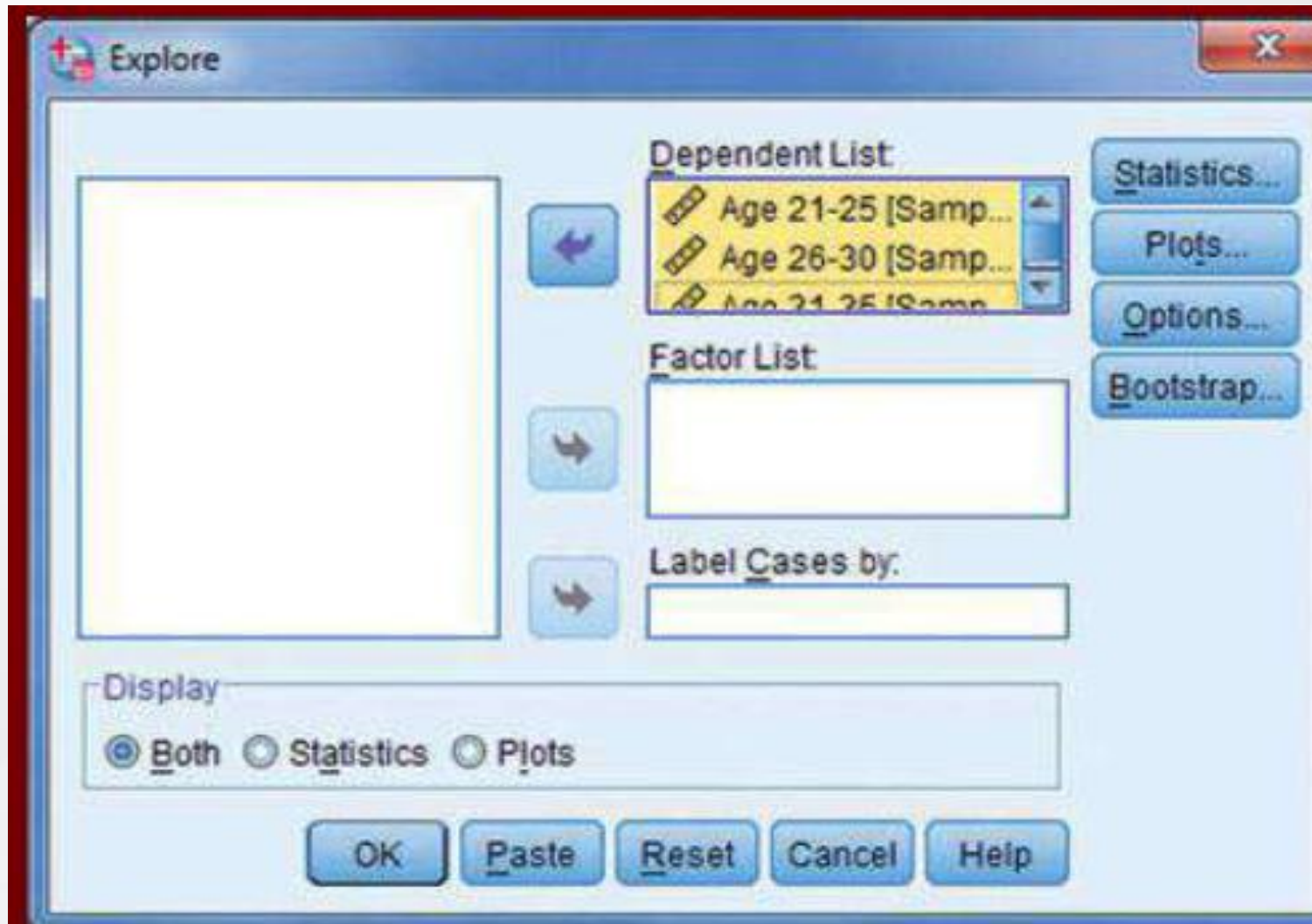
- **Skewness and Kurtosis (z-values)** – should be somewhere in the span of -1.96 to +1.96
- **The Shapiro-Wilk test p-value** – should be above 0.05
- **Histograms, Normal Q-Q plots and Box plots** – should visually indicate that our data are approximately normally distributed.

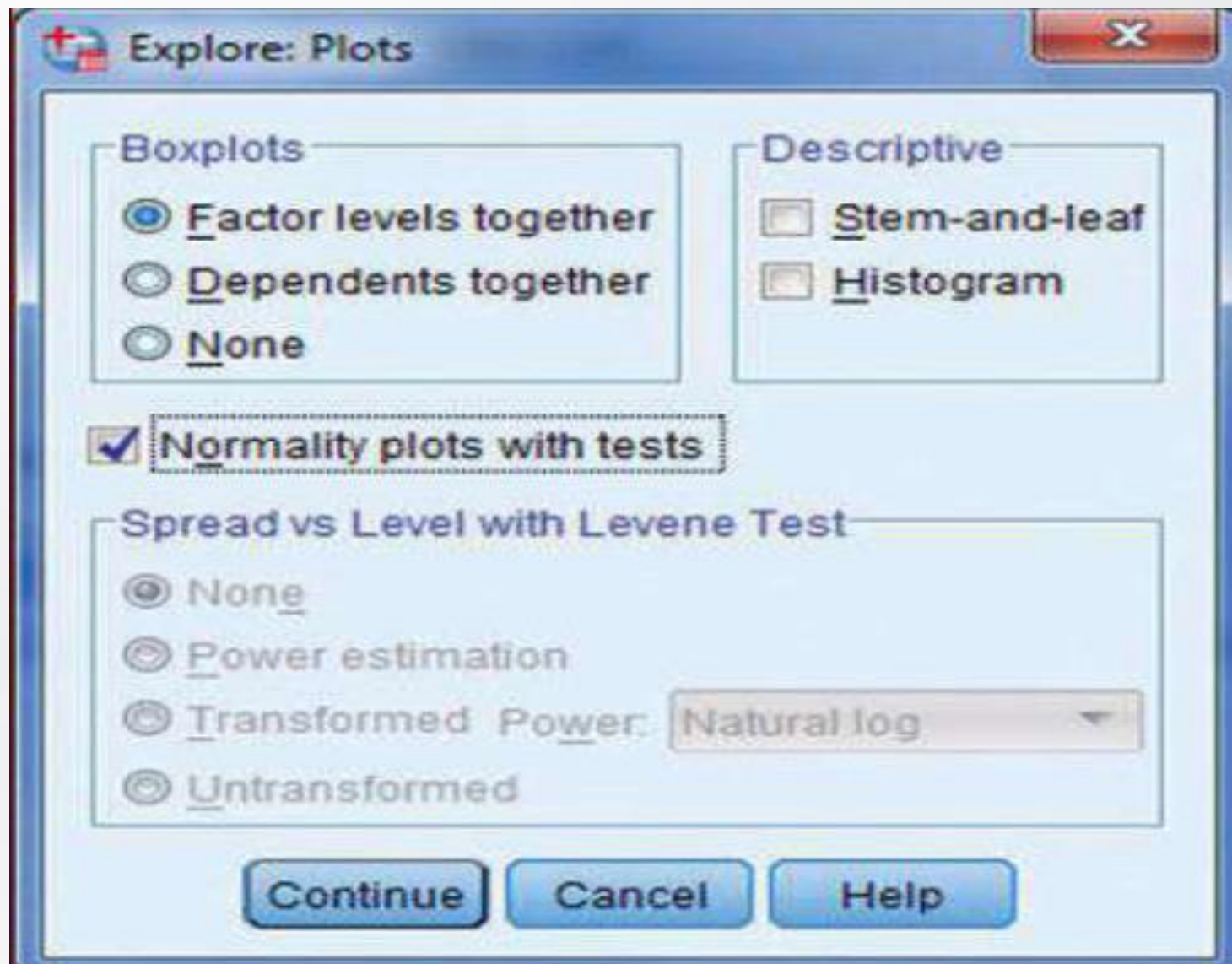
TESTING FOR NORMALITY

- Step 1 – Data Entry
- Step 2 – From **Analyze** drop-down menu, select **Descriptive Statistics** and then **Explore**.
- Step 3 – Select variables and send them to **Dependent List box**.
- Step 4 – Click on the **Plots** options. Untick **Stem and leaf** and tick **Histogram** and **Normality plots with tests**
- Step 5 – Click **Continue** and then Click **OK**

File Edit View Data Transform Analyze Direct Max				
	Sample1	Sample2	Sample3	
1	2.00	2.00	2.00	
2	11.00	20.00	2.00	
3	12.00	12.00	2.00	
4	15.00	15.00	2.00	
5	16.00	16.00	2.00	
6	16.00	16.00	2.00	
7	5.00	5.00	3.00	
8	10.00	20.00	3.00	
9	17.00	17.00	3.00	
10	17.00	18.00	3.00	
11	8.00	19.00	4.00	
12	10.00	19.00	4.00	
13	11.00	18.00	4.00	
14	4.00	3.00	5.00	
15	13.00	13.00	5.00	
16	14.00	14.00	6.00	
17	6.00	7.00	8.00	
18	10.00	10.00	8.00	
19	7.00	17.00	9.00	
20	14.00	14.00	9.00	
21	7.00	18.00	10.00	
22	12.00	15.00	6.00	
23	9.00	9.00	11.00	
24	13.00	11.00	7.00	
25	19.00	19.00	13.00	
26	9.00	14.00	14.00	
27	8.00	8.00	16.00	
28	10.00	19.00	12.00	







SPSS OUTPUT

- Look at the values of Skewness and Kurtosis
- Test of Normality Table
- Histogram

Descriptives

			Statistic	Std. Error
Age 21-25	Mean		11.0667	.75800
	95% Confidence Interval for Mean	Lower Bound	9.5164	
		Upper Bound	12.6169	
	5% Trimmed Mean		11.1296	
	Median		11.0000	
	Variance		17.237	
	Std. Deviation		4.15172	
	Minimum		2.00	
	Maximum		19.00	
	Range		17.00	
	Interquartile Range		6.25	
	Skewness		-.165	.427
	Kurtosis		-.437	.833
Age 26-30	Mean		13.8333	.92112
	95% Confidence Interval for Mean	Lower Bound	11.9494	
		Upper Bound	15.7172	
	5% Trimmed Mean		14.1296	
	Median		15.0000	
	Variance		25.454	
	Std. Deviation		5.04520	
	Minimum		2.00	
	Maximum		20.00	
	Range		18.00	
	Interquartile Range		7.25	
	Skewness		-.867	.427
	Kurtosis		-.027	.833
Age 31-35	Mean		7.0333	.91033
	95% Confidence Interval for Mean	Lower Bound	5.1715	
		Upper Bound	8.8952	
	5% Trimmed Mean		6.6852	
	Median		5.5000	
	Variance		24.861	
	Std. Deviation		4.98607	
	Minimum		2.00	

SKEWNESS AND KURTOSIS

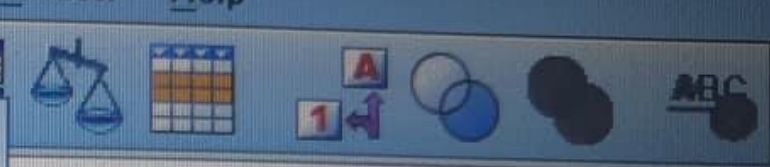
- A measure of how far skew and kurtosis deviate from the normal distribution is found by **dividing the value of skew by the standard error of skew**, and by **dividing kurtosis by the standard error of kurtosis**.
- If either or both these values is **(above +1.96 or below -1.96)**, then the assumption of **normality is rejected**.



Organization

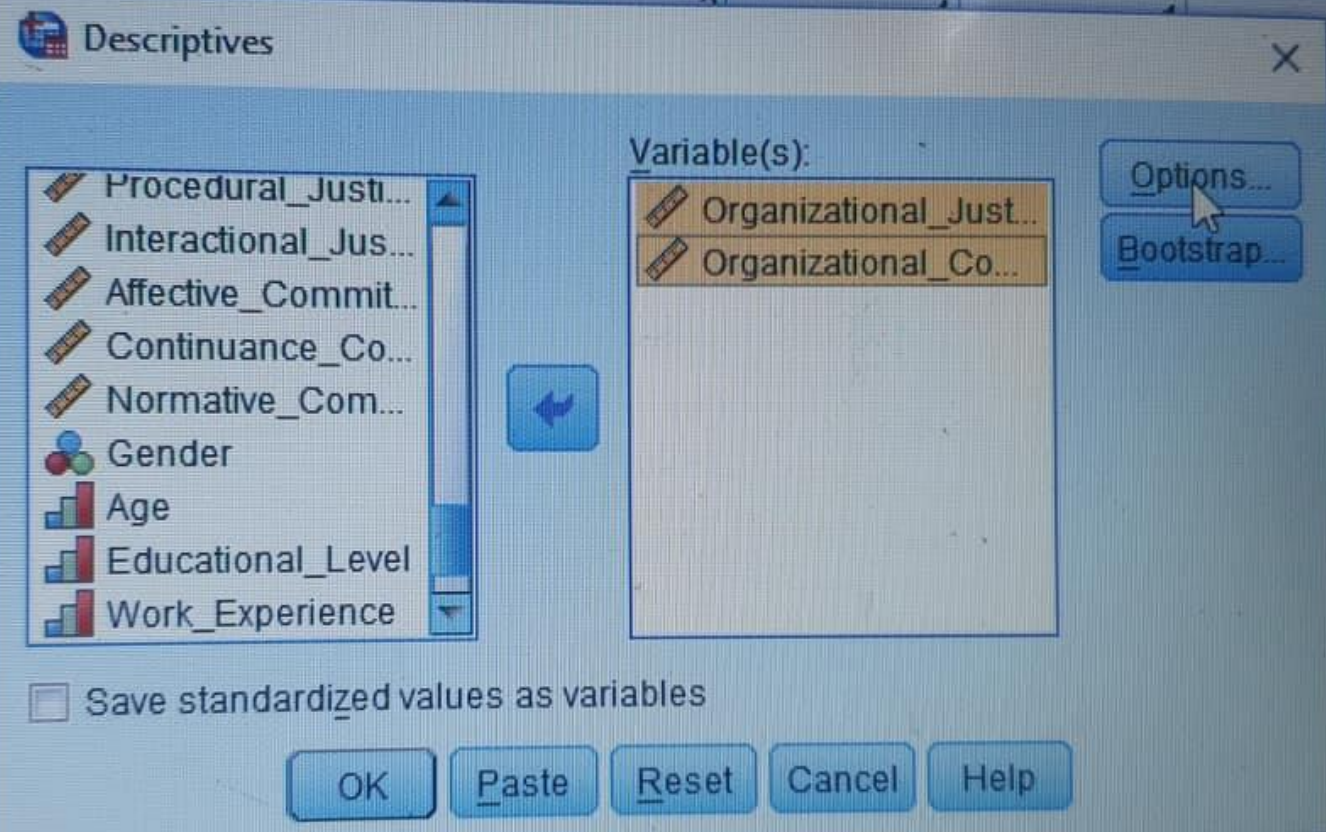
- Reports
- Descriptive Statistics**
- Tables
- Compare Means
- General Linear Model
- Generalized Linear Models
- Mixed Models
- Correlate
- Regression
- Loglinear
- Neural Networks
- Classify
- Dimension Reduction
- Scale
- Nonparametric Tests
- Forecasting
- Survival
- Multiple Response

- 123 Frequencies...
- Descriptives...**
- Explore...
- Crosstabs...
- 12 Ratio...
- P-P Plots...
- Q-Q Plots...



Personal	Work_Experience	Position	Nationality	va
2	3	2	1	
2	4	2	1	
5	3	4	1	
2	3	2	1	
2	2	4	1	
5	4	4	1	
1	2	3	2	1
1	1	4	3	2
2	3	4	3	1
2	1	1	3	4
2	3	3	3	4
2	4	3	2	1
2	1	1	1	1
1	4	4	3	1

1



Descriptives

Procedural_Jus
Interactional_Ju
Affective_Com
Continuance_C
Normative_Cor
Gender
Age
Educational_Le
Work_Experien

☐ Save standardized residuals

Descriptives: Options

☒ Mean ☐ Sum

Dispersion

☒ Std. deviation ☒ Minimum
☒ Variance ☒ Maximum
☒ Range ☒ S.E. mean

Distribution

☒ Kurtosis ☒ Skewness

Display Order

☒ Variable list
☐ Alphabetic
☐ Ascending means
☐ Descending means

Continue Cancel Help

Options...

Bootstrap...

3

Organizational_Commitment

DESCRIPTIVES VARIABLES=Organizational_Justice Organizational_Commitment
/STATISTICS=MEAN STDDEV VARIANCE RANGE MIN MAX SEMEAN KURTOSIS SKEWNESS.

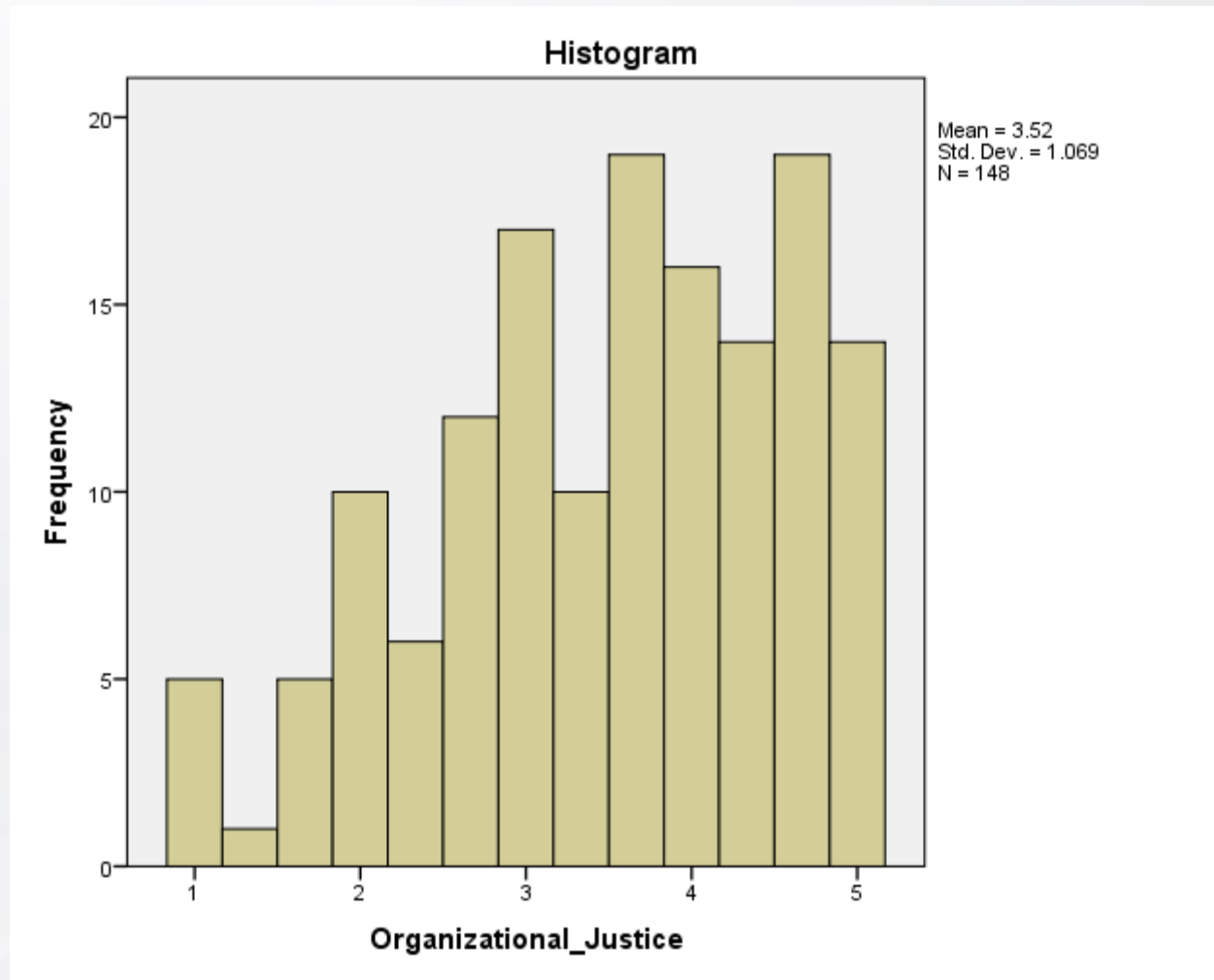
Descriptives

[DataSet2] F:\My Private Course\RM L 8\SPSS DATA .sav

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Organizational_Justice	148	4	1	5	3.52	.088	1.069	1.143	-.498	.199	-.604	.396
Organizational_Commitment	148	4	1	5	3.49	.072	.872	.761	.174	.199	-.510	.396
Valid N (listwise)	148											

IBM SPSS Statistics Process

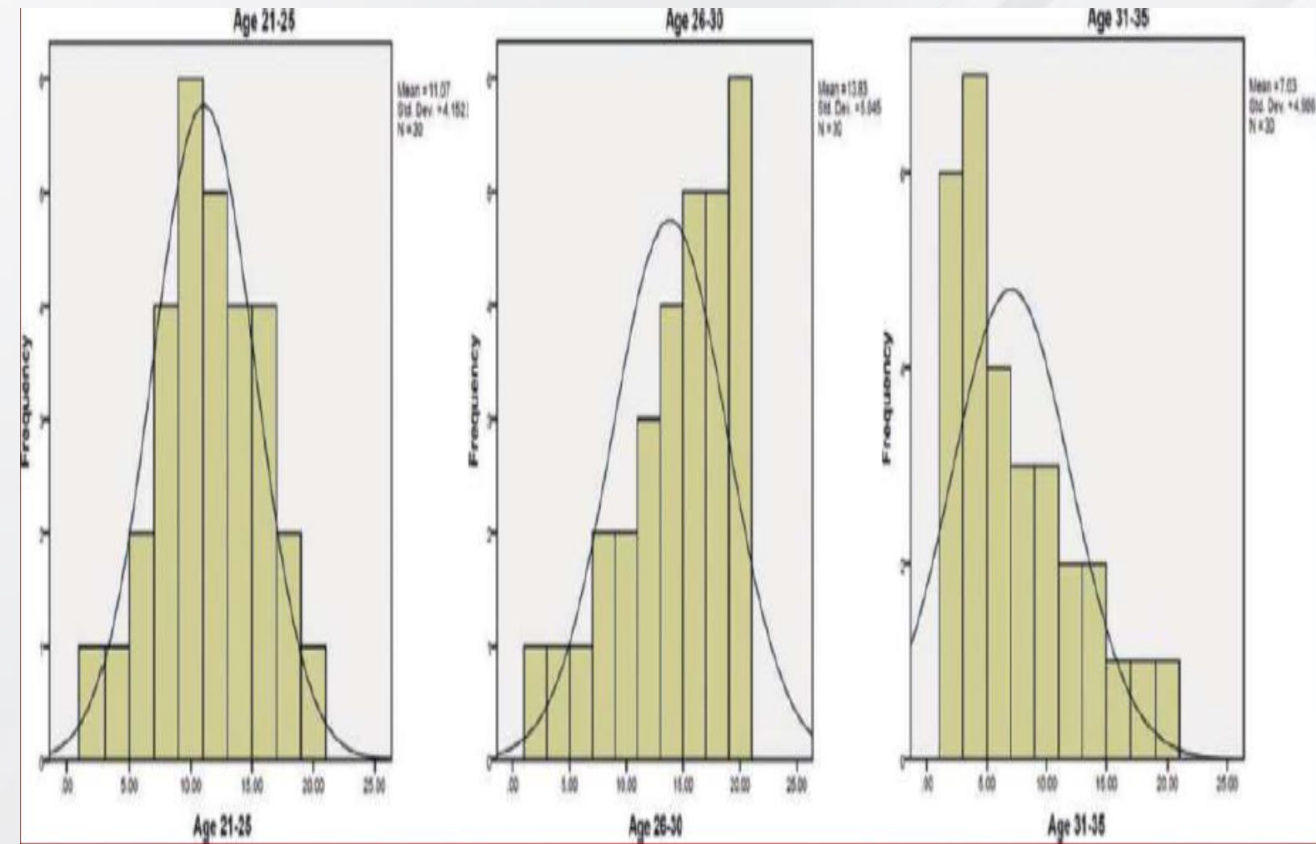
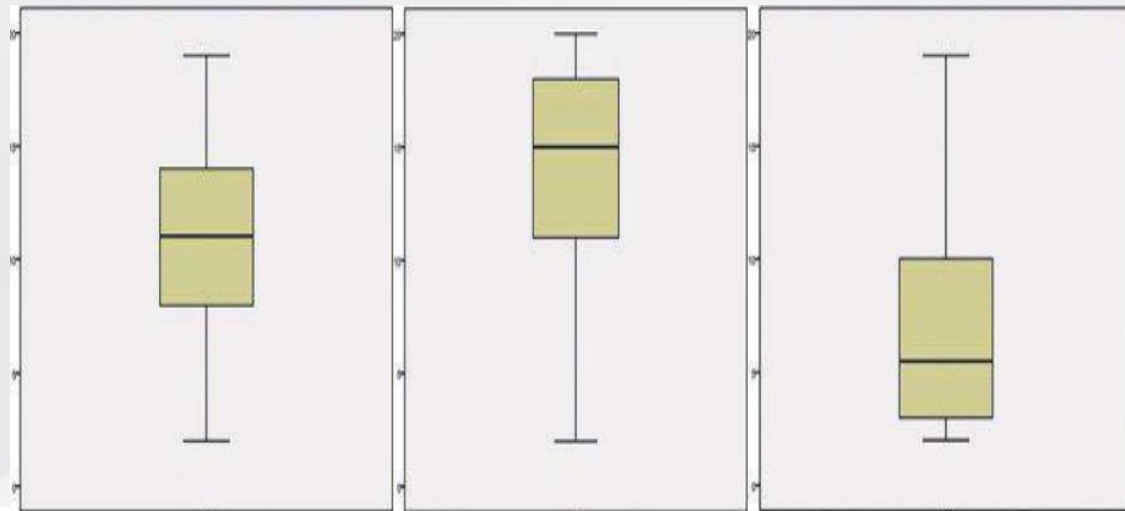
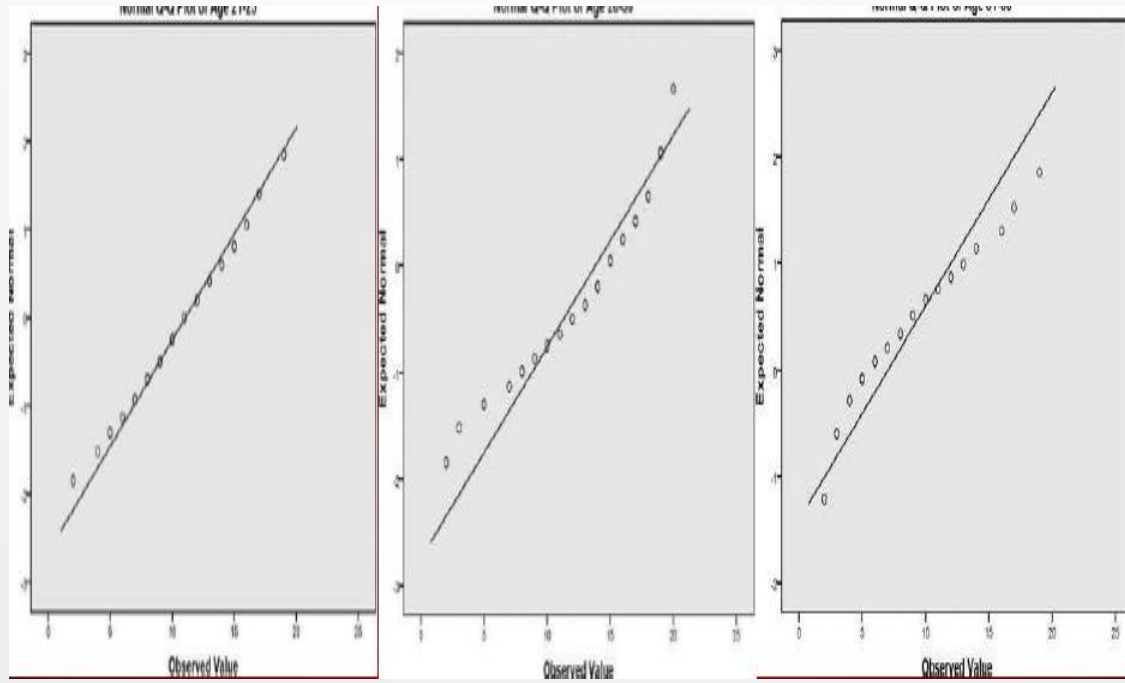


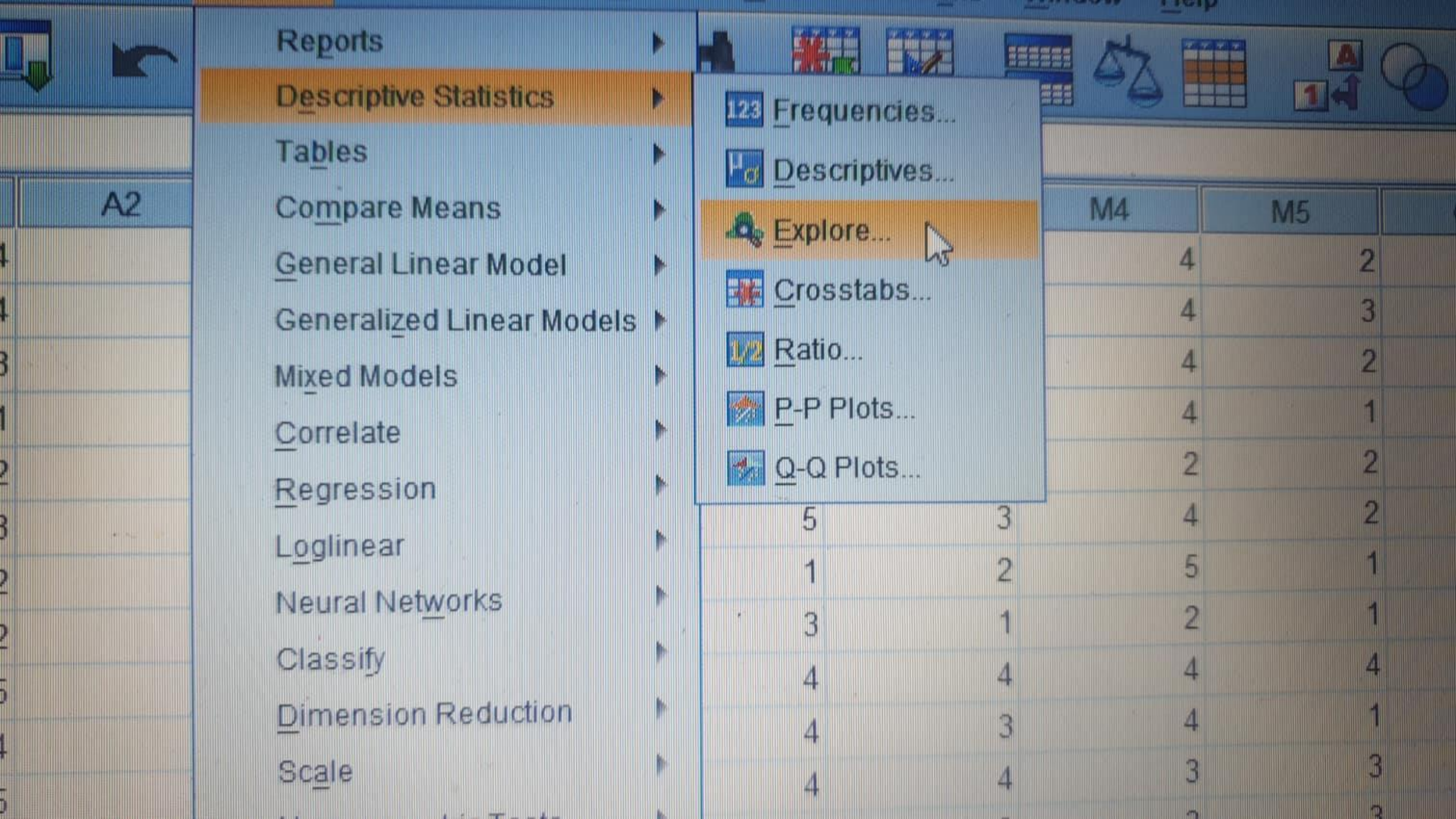
NORMALITY TEST

- SPSS displays the results of two test of normality, the **Kolmogorov- Smirnov** and the more powerful **Shapiro-Wilk Test**
- A significant finding of **$p < 0.05$** indicates that the sample distribution is significantly **different from the normal distribution**.

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Age 21-25	.068	30	.200 [*]	.988	30	.976
Age 26-30	.147	30	.099	.915	30	.020
Age 31-35	.162	30	.044	.881	30	.003





Reports

Descriptive Statistics

Tables

Compare Means

General Linear Model

Generalized Linear Models

Mixed Models

Correlate

Regression

Loglinear

Neural Networks

Classify

Dimension Reduction

Scale

123 Frequencies...

μd Descriptives...

Explore...

Crosstabs...

1/2 Ratio...

P-P Plots...

Q-Q Plots...

M4

M5

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Explore



- DJ1
- DJ2
- DJ3
- DJ4
- DJ5
- PJ1
- PJ2
- PJ3
- PJ4



Dependent List:

- Organizational_Just..
- Organizational_Co...

Factor List:

Label Cases by:

Statistics...

Plots...

Options...

Bootstrap...

Display

☒ Both ☐ Statistics ☐ Plots

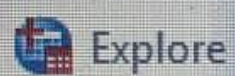
OK

Paste

Reset

Cancel

Help



Explore

DJ1

DJ2

DJ3

DJ4

DJ5

PJ1

PJ2

PJ3

PJ4

Display

☒ Both



Explore: Plots

Boxplots

☒ Factor levels together

☐ Dependents together

☐ None

Descriptive

☒ Stem-and-leaf

☒ Histogram

☒ Normality plots with tests

Spread vs Level with Levene Test

☐ None

☐ Power estimation

☐ Transformed Power: Natural log

☐ Untransformed

Continue

Cancel

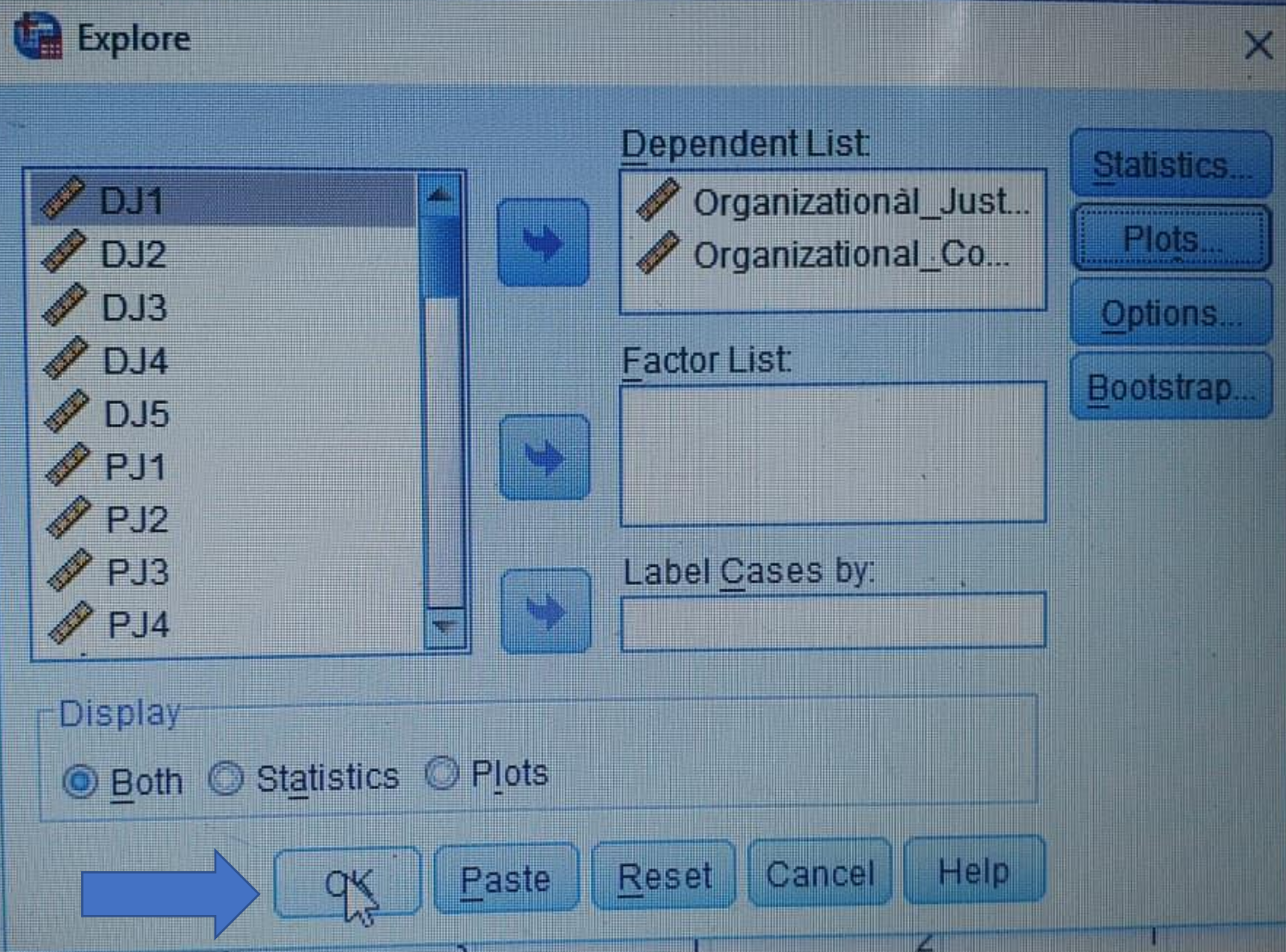
Help

Statistics...

Plots...

Options...

Bootstrap...



Range	4	
Interquartile Range	1	
Skewness	.174	.199
Kurtosis	-.510	.396

Tests of Normality

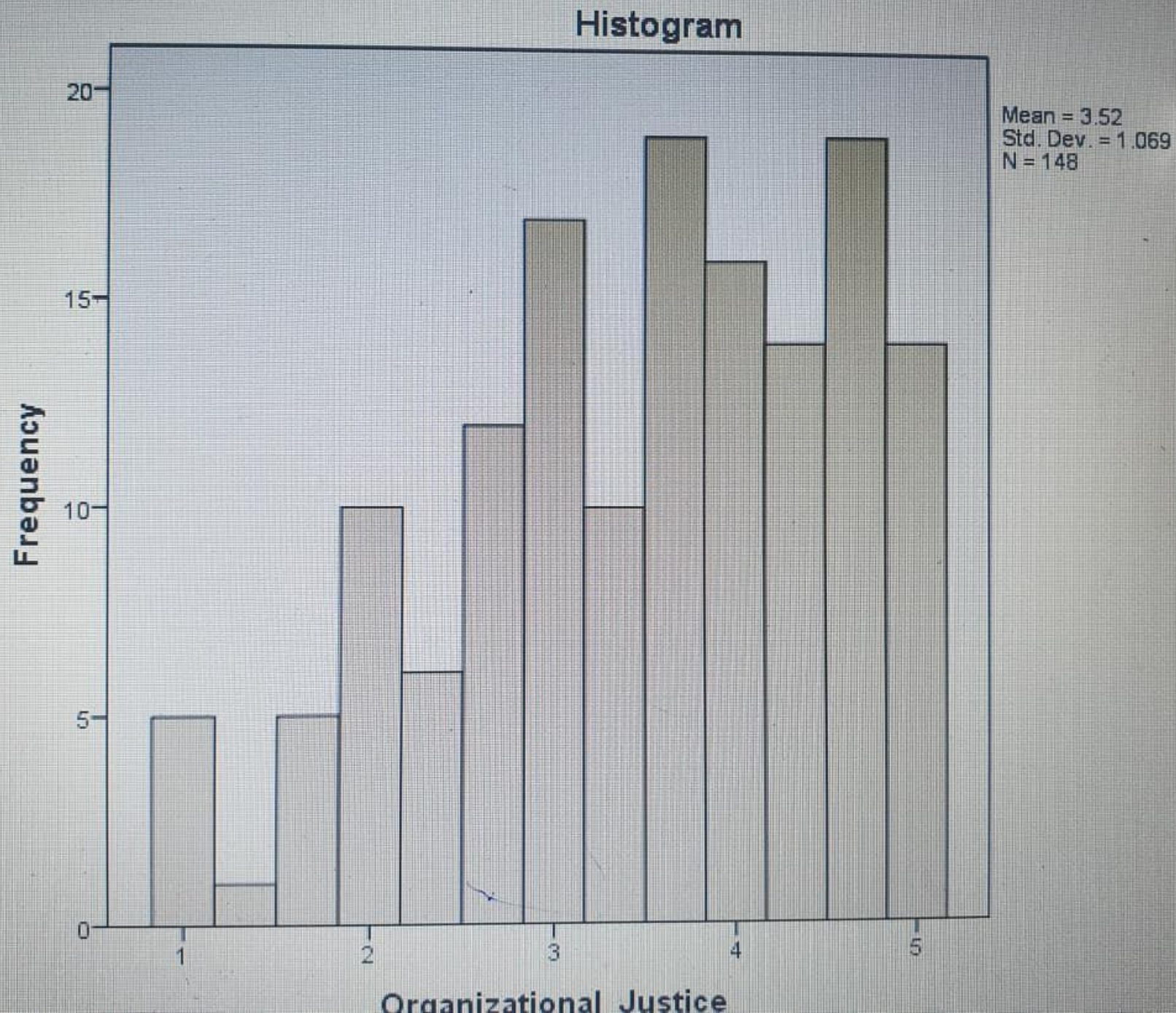
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Organizational_Justice	.083	148	.015	.950	148	.000
Organizational_Commitment	.127	148	.000	.943	148	.000

a. Lilliefors Significance Correction

Organizational_Justice

Lilliefors

- Stem-and-
- Normal Q-
- Detrended
- Boxplot
- Log
- Descriptives
- Title
- Notes
- Active Dataset
- Descriptive Sta
- Log
- Explore
- Title
- Notes
- Active Dataset
- Case Processi
- Descriptives
- Tests of Norma
- Organizational_
- Title
- Histogram
- Stem-and-
- Normal Q-
- Detrended
- Boxplot
- Organizational_
- Title
- Histogram
- Stem-and-



Multicollinearity

7



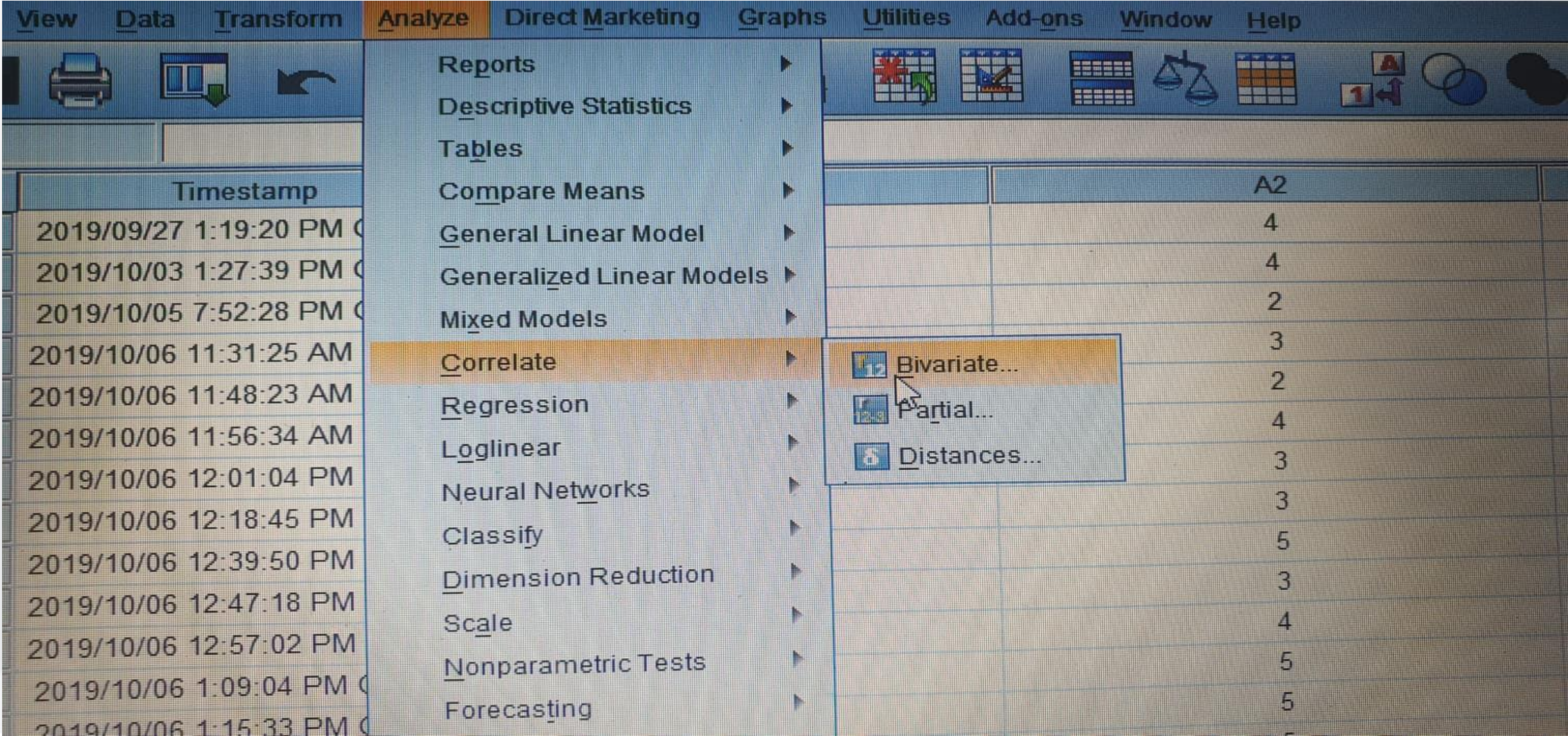
Multicollinearity

- Multicollinearity exists when independent variables (X 's) are correlated.
- Correlated independent variables make it difficult to make inferences about the individual regression coefficients (slopes) and their individual effects on the dependent variable (Y).
- However, correlated independent variables do not affect a multiple regression equation's ability to predict the dependent variable (Y).

Correlation Matrix

- A **correlation matrix** is used to show all possible simple correlation coefficients among the variables.
- The matrix is useful for locating correlated independent variables.
 - It shows how strongly each independent variable is correlated with the dependent variable.

Based on the study of Montgomery, Peck and Vining, (2012) the correlation above .80 refers to collinearity



timestamp			
9/09/27 1:19:20 PM GMT+2	4	4	3
9/10/03 1:27:39 PM GMT+2	4		
9/10/05 7:52:28 PM GMT+2	3		
9/10/06 11:31:25 AM GMT+2	1		
9/10/06 11:48:23 AM GMT+2	2		
9/10/06 11:56:34 AM GMT+2	3		
9/10/06 12:01:04 PM GMT+2	2		
9/10/06 12:18:45 PM GMT+2	2		
9/10/06 12:39:50 PM GMT+2	5		
9/10/06 12:47:18 PM GMT+2	4		
9/10/06 12:57:02 PM GMT+2	5		
9/10/06 1:09:04 PM GMT+2	5		
9/10/06 1:15:33 PM GMT+2	5		
9/10/06 1:33:08 PM GMT+2	4		
9/10/06 1:36:56 PM GMT+2	3		
9/10/06 1:51:19 PM GMT+2	2		
9/10/06 1:58:19 PM GMT+2	4		
9/10/06 2:28:22 PM GMT+2	4		
9/10/06 2:35:52 PM GMT+2	1		
9/10/06 3:34:11 PM GMT+2	4		
9/10/06 5:14:25 PM GMT+2	5		

Bivariate Correlations

Variables:

- Position_Title
- Ability
- Motivation
- Opportunity
- HPWSs
- System_Quality
- Information_Qual...
- Service_Quality
- KMSc

Correlation Coefficients

☒ Pearson ☐ Kendall's tau-b ☐ Spearman

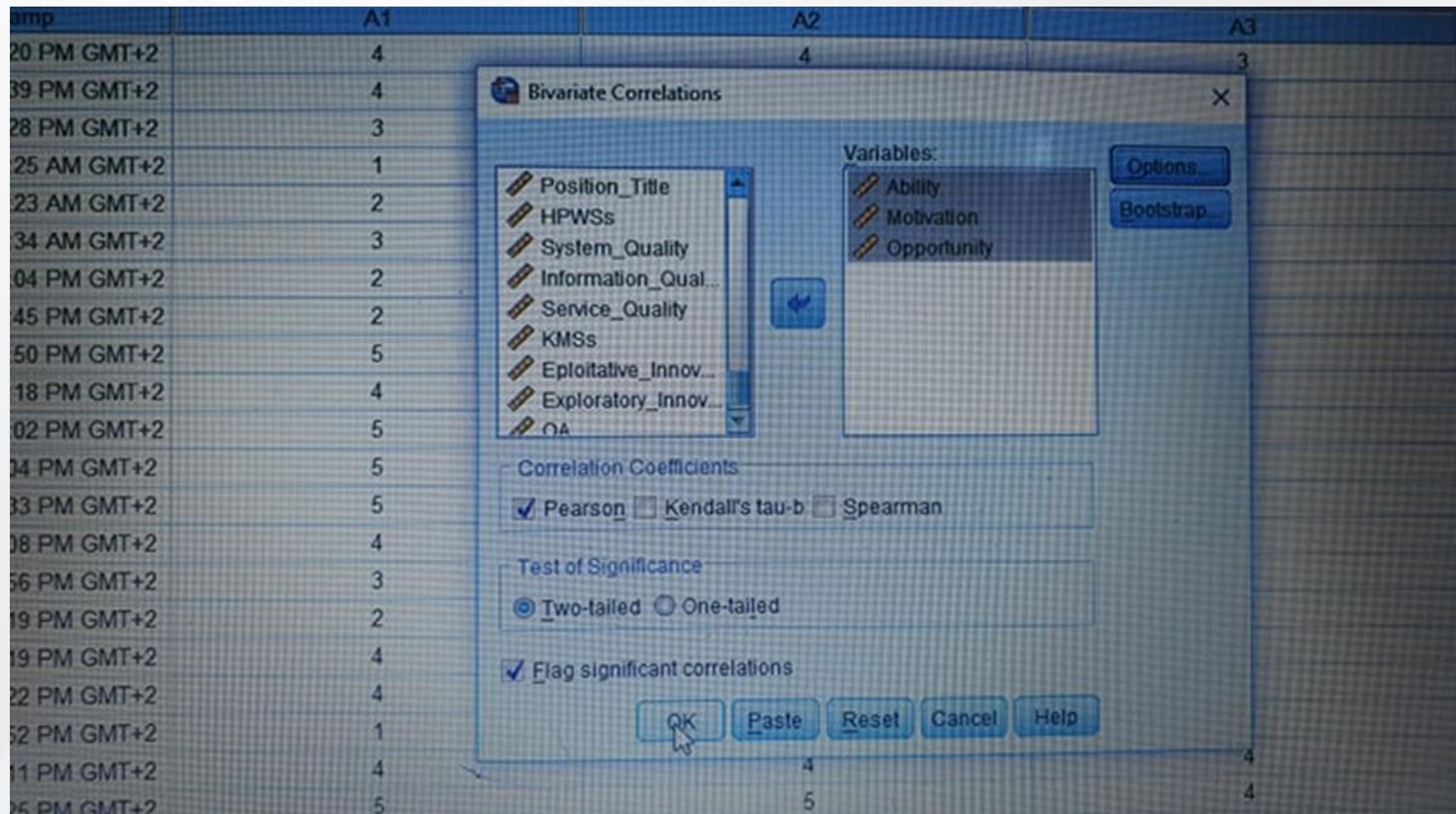
Test of Significance

☒ Two-tailed ☐ One-tailed

☒ Flag significant correlations

Options Bootstrap

OK Paste Reset Cancel Help



→ Correlations

[DataSet2] F:\My Private Course\RM L 8\Untitled2.sav

Correlations

		Ability	Motivation	Opportunity
Ability	Pearson Correlation	1	.649**	.600**
	Sig. (2-tailed)		.000	.000
	N	277	277	277
Motivation	Pearson Correlation	.649**	1	.739**
	Sig. (2-tailed)	.000		.000
	N	277	277	277
Opportunity	Pearson Correlation	.600**	.739**	1
	Sig. (2-tailed)	.000	.000	
	N	277	277	277

** . Correlation is significant at the 0.01 level (2-tailed).

Another way used to measure the multicollinearity through calculating Variance Inflation Factor (VIF) to check any collinear variables that may exist in the research model, based on Field (2005, 2009).

There is no collinearity among the research variables, when all VIF values < 10 . Moreover, the tolerance statistics scores of all the variables are > 0.2 . Thus, based on the study of Field (2009)

Multicellularity tests are used to indicate to discriminant validity

No	Competence (X1)	Motivation (X2)	Performance (Y)
1	32	34	36
2	35	37	39
3	38	45	49
4	31	41	41
5	36	40	38
6	32	38	36
7	33	39	37
8	31	40	41
9	30	37	40
10	35	37	43
11	31	34	36
12	34	32	35
13	31	42	34
14	25	36	40
15	35	42	40
etc....	36	41	

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*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Direct Marketing Graph



	Name	Type	Width	Decimals
1	Competence	Numeric	8	2
2	Motivation	Numeric	8	2
3	Performance	Numeric	8	2
4				

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*Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

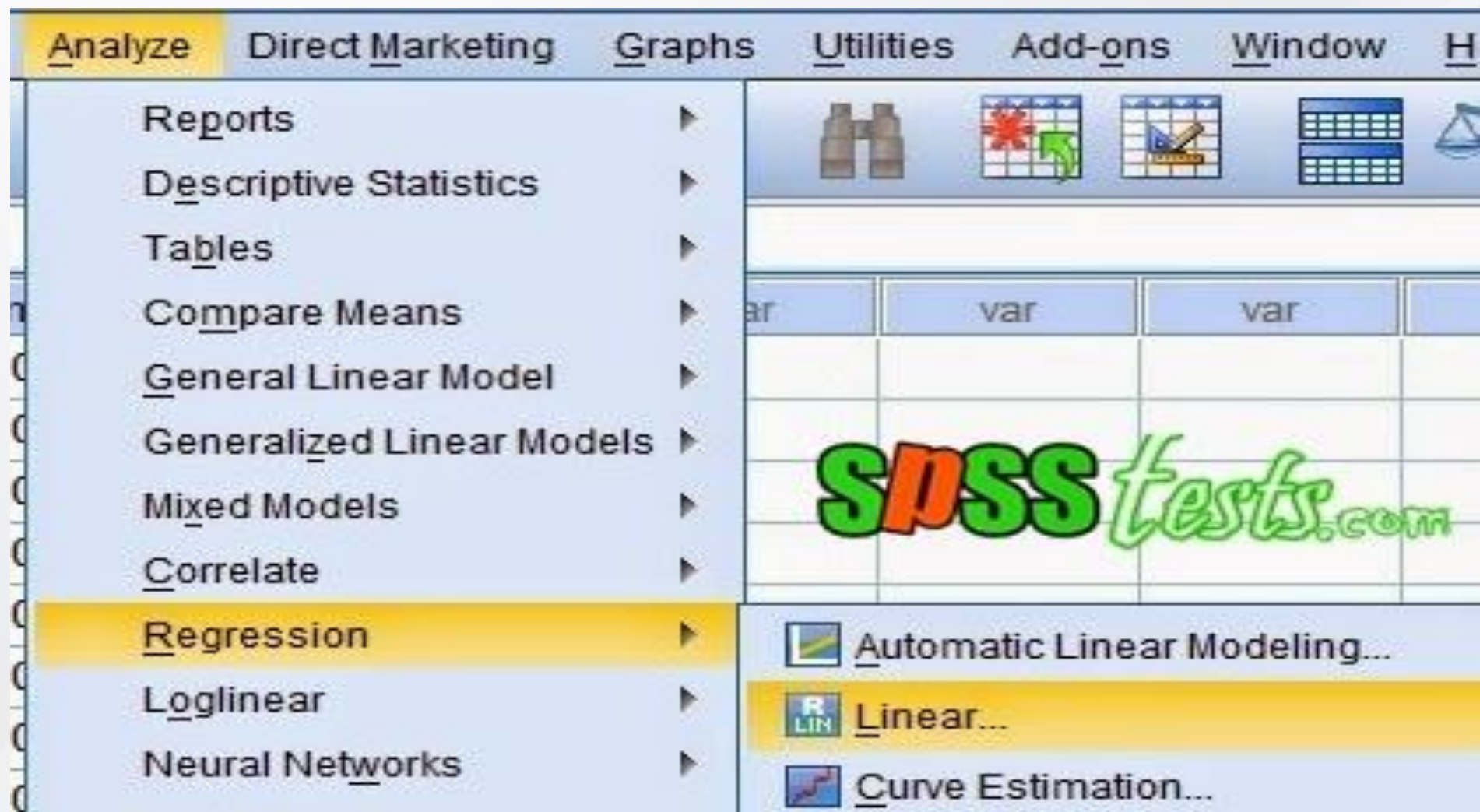
File Edit View Data Transform Analyze Direct M

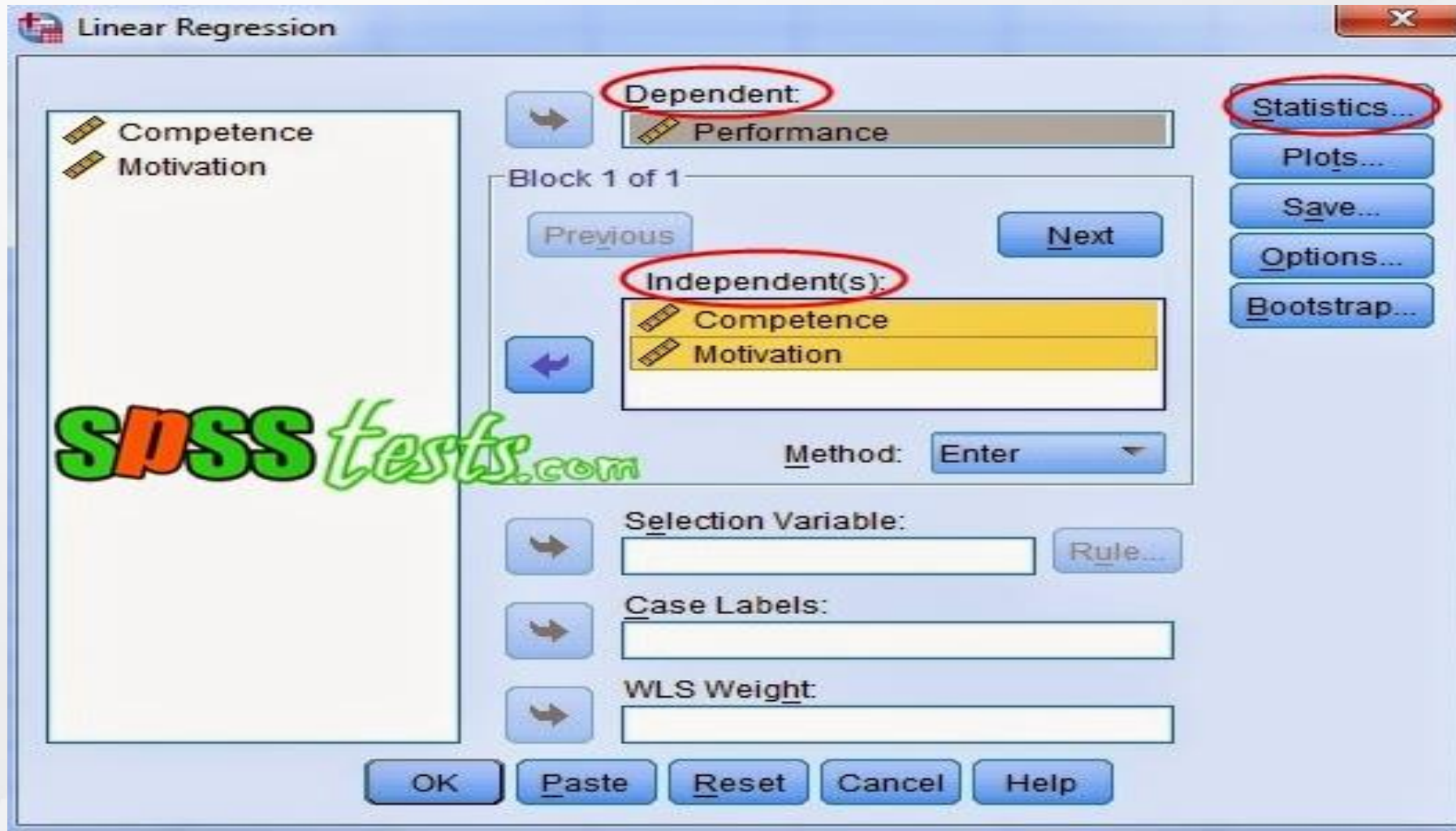


	Competence	Motivation	Performance
1	32,00	34,00	36,00
2	35,00	37,00	39,00
3	38,00	45,00	49,00
4	31,00	41,00	41,00
5	36,00	40,00	38,00
6	32,00	38,00	36,00
7	33,00		

etc....

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Linear Regression: Statistics

Regression Coefficients

- ☒ Estimates
- ☐ Confidence intervals
Level(%): 95
- ☐ Covariance matrix

☒ Model fit

- ☐ R squared change
- ☐ Descriptives
- ☐ Part and partial correlations
- ☒ Collinearity diagnostics

Residuals

- ☐ Durbin-Watson
- ☐ Casewise diagnostics
 - ☒ Outliers outside: 3 standard deviations
 - ☐ All cases

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Continue Cancel Help

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	7,220	4,020	1,796	,081		
	Competence	,432	,166	,358	,013	,552	1,812
	Motivation	,453	,125	,499	,001	,552	1,812

a. Dependent Variable: Performance

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Kaiser–Meyer–Olkin
(KMO) and Bartlett of
sphericity Tests

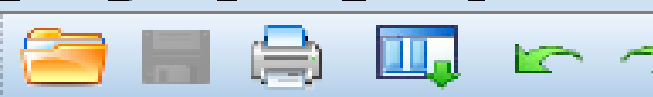
8



- Regarding the sample size suitability (sampling adequacy) through using the Kaiser–Meyer–Olkin (KMO) and Bartlett’s test measure of sampling (Kaiser, 1974). The KMO test results should range from 0 to 1.
- Result that is close to 1 refers to the more adequacy sample size. Consequently, the more consistent results of the factor analysis. Kaiser (1974) suggests a range to accept a sample size, which is the value of $KMO > 0.5$.
- Moreover, Hutcheson and Sofroniou (1999) recommend that acceptable values that are laying between 0.5 and 0.7, good values that are laying between 0.7 and 0.8, great values are between 0.8 and 0.9, and perfect values that are greater than 0.9.
- Also, test of Bartlett of sphericity must also be measured.
- This test indicates the extent to which the study study’s correlation matrix is significantly distinct from an identity matrix which its covariances and coefficients of all correlation = zero (Bartlett, 1954). The significant result indicates that the correlation matrix of the study is completely different from the identity matrix. Thus, Bartlett’s test significance refers to the suitability of the factor analysis.

Bartlett's Test of Sphericity $P < 0.001$

**Interpretation: the correlation matrix is not an identity matrix;
the correlation matrix shows unique correlations**



	AgeParticipant	Participant
1	37.00	
2	38.00	
3	.	
4	.	
5	36.00	
6	26.00	
7	37.00	
8	35.00	
9	37.00	
10	34.00	
11	25.00	
12	.	
13	36.00	
14	.	
15	27.00	
16	33.00	
17	.	
18	35.00	
19	40.00	
20	40.00	
21	29.00	
22	43.00	
23	29.00	
24	29.00	

- Reports
- Descriptive Statistics
- Bayesian Statistics
- Tables
- Compare Means
- General Linear Model
- Generalized Linear Models
- Mixed Models
- Correlate
- Regression
- Loglinear
- Neural Networks
- Classify
- Dimension Reduction
- Scale
- Nonparametric Tests
- Forecasting
- Survival
- Multiple Response
- Missing Value Analysis...
- Multiple Imputation
- Complex Samples
- Simulation...
- Quality Control
- ROC Curve...
- Spatial and Temporal Modeling...
- Direct Marketing



	Income	AgeChild	Dx
1	2.00	6.00	
2	3.00	10.00	
3	.	2.00	
4	2.00	10.00	
5	.	.00	
6	.	6.00	
7	3.00	9.00	
8	4.00	6.00	
9	.	2.00	
10	2.00	2.00	
11	2.00	.	
12	.00	5.00	
13	1.00	6.00	
14	2.00	2.50	
15	5.00	4.00	
16	.	7.00	
17	.	.	
18	3.00	2.00	
19	3.00	7.50	
20	.00	2.00	
21	1.00	.	

- Factor...
- Correspondence Analysis...
- Optimal Scaling...

Kaiser-Meyer-Olkin (KMO) Test

The image shows two overlapping SPSS dialog boxes. The background box is the 'Factor Analysis' dialog, and the foreground box is the 'Factor Analysis: Descriptives' sub-dialog.

Factor Analysis Dialog:

- Variables:** A list of variables including AgeP [AgePartici...], P [Participant], City [City], Ed [Education], SS [Social], Income [Income], AgeC [AgeChild], Diagnosis [Dx], SxS [SxSeverity], DxS [DxDate], and Hospital Admissi... is on the left. A list of variables including ParentTrauma1 [...], ParentTrauma2 [...], ParentTrauma3 [...], ParentTrauma4 [...], ParentTrauma5 [...], ParentTrauma6 [...], and ParentTrauma7 [...] is on the right.
- Selection Variable:** A text box for specifying a selection variable, with a 'Value...' button below it.
- Buttons:** Descriptives..., Extraction..., Rotation..., Scores..., and Options... are on the right. OK, Paste, Reset, Cancel, and Help are at the bottom.

Factor Analysis: Descriptives Dialog:

- Statistics:** ☐ Univariate descriptives, ☒ Initial solution.
- Correlation Matrix:** ☐ Coefficients, ☐ Inverse, ☐ Significance levels, ☐ Reproduced, ☐ Determinant, ☐ Anti-image, ☒ KMO and Bartlett's test of sphericity.
- Buttons:** Continue, Cancel, and Help are at the bottom.

➔ Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.834
Bartlett's Test of Sphericity	Approx. Chi-Square	1056.555
	df	190
	Sig.	.000

Course Evaluation





رأيك يهمني
أكتب أسمك + تقييمك لدورة البحث العلمي

<https://padlet.com/monaashry77/padlet-xr709opfeqfrbh7t>



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Thank You

