

University of Applied Sciences

Academic Skills II – Lecture 5

Quantitative Research Summersemester 2022

Group 1: Melanie Hense, BA → <u>hense@fhwn.ac.at</u> Group 2: Mag. Severin Maurer, BA → <u>severin.maurer@fhwn.ac.at</u> Group 3: Dr. Karin Wegenstein → <u>karin.wegenstein@fhwn.ac.at</u>

Course Leader: Melanie Hense, BA - hense@fhwn.ac.at Institute for Market Research & Methodology





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GROUP ASSIGNMENTS (=Group Research Topic)											
1.1. Qualitative Survey Instrument - Version 1 (binary)	Thursday, 17.03.2022 Submission in PDF on Edunet + E-Mail to Peer-Group (with lecturer in cc)										
1.2. Peer Review: Qualitative Survey Instrument (binary)	Thursday, 24.03.2022 Submission in PDF on Edunet + E-Mail to Peer-Group (with lecturer in cc)										
1.3. Final Qualitative Survey Instrument (15%)	Thursday, 28.03.2022 Submission in PDF on Edunet										
2. Quantitative Questionnaire (10%)	Thursday, 31.03.2022 Submission in PDF + Qualtrics Link on Edunet										
3. Presentation of empirical results (20%)	Wednesday, 04.05.2022 Presentation – attendance of every group member required										

Submission **Deadlines**

In order to positively complete the course, each assignment must be submitted by the due date and be passed. Non-submission results in a negative course grade

Learning Outcomes

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This lecture provides knowledge specific for your group task 2, that is:

- 1. What do I need to do right after data collection (scale scores)?
- 2. What are descriptive statistics and which of them do I need?
- 3. How do I perform a hypothesis test and what do I do with the p-value?
- 4. What is a correlational analysis and how do I conduct it?
- 5. What happens next?

Survey

Kindly Participate



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DISCOVERING Statistics Using IBM SPSS Statistics



ANDY FIELD

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SAGE edge



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Source: Field, Andy. 2018. Discovering statistics using IBM SPSS Statistics (5th ed). London, u.a.: SAGE

Questions?





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1. What do I need to do right after data collection (scale scores)?

Step 1: Prepare your data

Introduction

- With respect to your last group session, we provided you with various scales which you will use in your survey
- These scales consist of various items and intend to measure constructs, which in most cases consist of some dimensions
- For each item, you will get a score from the participants of your own survey but how do you get from your Qualtrics survey to your SPSS dataset?
- And how do you get from these single item scores to the dimension scores, which you are interested in actually?



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Introduction

• The first question is: how do I get a SPSS file from the survey tool Qualtrics?



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• \rightarrow in Qualtrics you will find a "Export"-function, and there you can export the survey data as a SPSS-file



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SPSS: BFI-2-S example

- From now on, all further steps are taken in the software IBM SPSS
- Let's have a look at some data in IBM SPSS for the scale BFI-2-S, which all of you will use for your own survey (assume we have collected data from 50 participants)
- IBM SPSS is a statistical software package very often used in the social sciences, and basically, it consists of two separate windows – a dataset window (which contains a data view mode and a variable view mode) and an output window (which shows all the statistical results you conduct as well as a source code of your taken actions)



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IBM SPSS Statistics Processor is ready

1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dataset window – variable view mode

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9	BEL 2 S 9	Numeric	8	0	I am someone who tends to feel depressed, blue	{1 Disagree	9999	8	= Right	Ordinal	> Input	
10	BEL 2 S 10	Numeric	8	0	I am someone who has little interest in abstract ideas	{1 Disagree	9999	8	= Right	Ordinal	> Input	
11	BEL 2 S 11	Numeric	8	0	am someone who is full of energy	{1 Disagree	9999	8	= Right	Ordinal	> Input	
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13	BEL 2 S 13	Numeric	8	0	I am someone who is reliable, can always be counted on	{1 Disagree	9999	8	= Right	Ordinal	> Input	
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15	BEL 2 S 15	Numeric	8	0	I am someone who is original comes up with new ideas	{1 Disagree	9999	8	I Right	Ordinal	> Input	
16	BEL 2 S 16	Numeric	8	0	I am someone who is outgoing, sociable	{1 Disagree	9999	8	E Right	Ordinal	> Input	
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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dataset window – data view mode

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26	Disagree s	Disagree a	Disagree s	Disagree s	Neutral, no	Agree stro	. Disagree s	Agree a little	e Agree stro	. Neutral, no	. Agree stro	Disagree a	Neutral, no	. Disagree a	Agree stro	Neutral, no	Agree a little	Agree stro	Disagree s	Disagree s	Agree stro	Neutral, no	<u> </u>
27	Neutral, no	Disagree a	Neutral, no	Neutral, no	Disagree a	Neutral, no	. Agree stro	Agree a little	e Disagree s	. Neutral, no	. Agree a little	e Agree a little	Agree a little	e Agree stro	Agree a little	Disagree s	Disagree s	Agree stro	Agree a little	Disagree s	Agree stro	Agree stro	P
28	Agree a little	Agree a little	Neutral, no	Disagree a	Agree a little	Disagree a	. Disagree a	Disagree s	. Agree stro	. Agree a little	e Disagree s	. Neutral, no	Agree stro	. Agree stro	Disagree s	Agree stro	Disagree s	Disagree a	Disagree a	Neutral, no	Agree stro	Disagree s	P
29	Agree stro	Disagree a	Disagree a	Disagree a	Neutral, no	Agree stro	. Disagree a	Agree stro	. Agree stro	. Neutral, no	. Disagree s	Disagree a	Disagree a	. Disagree s	Agree stro	Neutral, no	Disagree a	Disagree s	Neutral, no	Neutral, no	Neutral, no	Disagree s	<u> </u>
30	Agree a little	Disagree s	Neutral, no	Agree stro	Disagree a	Disagree a	. Agree stro	Neutral, no	. Agree a little	Disagree s	. Agree a little	e Agree a little	Disagree s	. Neutral, no	Agree stro	Disagree a	Neutral, no	Neutral, no	Agree a little	Disagree a	Neutral, no	Disagree a	
31	Agree stro	Disagree a	Agree stro	Agree a little	Agree stro	Neutral, no	. Disagree a	Agree stro	. Agree a little	Disagree s	. Agree a little	Agree stro	Neutral, no	. Agree a little	Agree stro	Agree a little	Agree stro	Neutral, no	Disagree a	Disagree a	Disagree a	Neutral, no	4
32	Agree stro	Agree stro	Agree stro	Agree stro	Disagree s	Disagree a	. Agree stro	Disagree a	. Agree stro	Disagree s	. Disagree s	Agree stro	Disagree s	. Agree stro	Agree a little	Agree stro	Agree a little	Disagree a	Disagree a	Agree stro	Neutral, no	Neutral, no	4
33	Agree stro	Agree stro	Agree a little	Disagree s	Neutral, no	Neutral, no	. Agree stro	Agree a little	e Agree a little	Neutral, no	. Neutral, no	Agree a little	Agree stro	. Disagree s	Agree a little	Neutral, no	Agree a little	Disagree a	Neutral, no	Neutral, no	Agree stro	Disagree a	4
34	Agree a little	Neutral, no	Neutral, no	Agree a little	Agree a little	Disagree s	. Agree a little	Disagree a	. Disagree a	Disagree a	. Disagree a	Agree a little	Agree a little	Disagree s	Neutral, no	Disagree a	Agree a little	Neutral, no	Disagree s	Disagree a	Agree a little	Agree stro	Α
35	Agree stro	Agree a little	Disagree a	Agree stro	Disagree a	Agree stro	. Disagree a	Disagree a	. Neutral, no	Disagree s	. Agree stro	Neutral, no	Agree a little	Agree a little	Disagree a	Disagree a	Agree a little	Agree stro	Neutral, no	Agree a little	Agree stro	Disagree a	A
36	Neutral, no	Disagree s	Agree a little	Disagree a	Agree a little	Neutral, no	. Disagree s	Agree a little	e Neutral, no	Disagree a	. Agree stro	Disagree s	Disagree a	. Agree a little	Disagree a	Agree stro	Neutral, no	Disagree s	Agree stro	Disagree a	Agree a little	Agree a little	D
27	4	A	Discourse	A	Distance	A	A	A	A	Distance	Distance	Distance	Discourse	A	Discourse	Discourse	A	A	Discourse	A	A	A	Note

🕼 Dataset_bfi_2_s.sav [DataSet0] - IBM SPSS Statistics Data Editor



Austrian Network for Higher Education

1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dataset window – output window



SPSS: BFI-2-S example/ variable view mode

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 In the variable view mode, you can set all of the relevant characteristics of your variables (e.g. the level of measurement, remember lecture 4!)

• Let's go through the most important setting options (with reference to the scale file that you received).



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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/variable view mode – variable name

BFI-2-S¶

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please choose a number next to each statement to indicate the extent to which you agree or disagree with that statement.

Ħ	Ŗ	1.=•Disagree•strongly¤	2.=∙Disagree·a·little¤	3·=·Neutral;∙no∙opinion¤	4=-Agree-a-littleA	5-=:Agree-stronglyX	
۱¤	l·am·someone·who·tends·to·be·quiet.¤	⊖¤	⊖¤	⊖¤	⊖¤	⊂¤ ¤	
2 ¤	l·am·someone·who·is·compassionate,·has·a·soft·heart.¤	⊖¤	⊖¤	⊖¤	⊃¤	¤ ¤⊖	
3¤	l·am·someone·who·tends·to·be·disorganized.¤	⊖¤	⊃¤	⊃¤	⊃¤	⊂¤ ¤	
4 ¤	l·am·someone·who·worries·a·lot.¤	⊖¤	⊖¤	⊖¤	⊖¤	¤ ¤⊖	
5¤	l·am·someone·who·is·fascinated·by·art,·music,·or·literature.¤	⊖¤	⊃¤	⊖¤	⊃¤	¤⊖	
6 ¤	l·am·someone·who·is·dominant,·acts·as·a·leader.¤	Q¤	O¤	⊖¤	⊖¤	¤ ¤O	
7 ¤	l·am·someone·who·is·sometimes·rude·to·others.¤	⊖¤	⊖¤	⊖¤	⊖¤	⊠¤ ¤	
8 ¤	l·am·someone·who·has·difficulty·getting·started·on·tasks.¤	⊖¤	⊃¤	⊖¤	⊖¤	⊂¤ ¤	
9 ¤	l·am·someone·who·tends·to·feel·depressed,·blue.¤	⊖¤	⊖¤	⊖¤	⊃¤	¤⊖	
10¤	l·am·someone·who·has·little·interest·in·abstract·ideas.¤	⊖¤	⊖¤	⊖¤	⊃¤	⊂¤ ¤	
11 ¤	l·am·someone·who·is·full·of·energy.¤	⊖¤	⊖¤	⊃¤	⊃¤	¤ ¤⊖	
12¤	l·am·someone·who·assumes·the·best·about·people.¤	⊖¤	⊖¤	⊖¤	⊃¤	¤¤⊖	
13¤	l·am·someone·who·is·reliable,·can·always·be·counted·on.¤	⊖¤	⊖¤	⊖¤	⊃¤	¤⊙	
14¤	$l\text{-}am\text{-}someone\text{-}who\text{-}is\text{-}emotionally\text{-}stable,\text{-}not\text{-}easily\text{-}upset.^{\bowtie}$	⊖¤	\bigcirc ¤	⊖¤	⊖¤	¤()	
15¤	l·am·someone·who·is·original,·comes·up·with·new·ideas.¤	⊖¤	⊖¤	⊖¤	⊖¤	¤ ¤⊖	
16¤	l·am·someone·who·is·outgoing,·sociable.¤	⊖¤	○¤	⊃¤	⊃¤	¤Ω	
17¤	l·am·someone·who·can·be·cold·and·uncaring.¤	Q¤	○¤	Q¤	Q¤	⊠¤ ¤	
18¤	I am someone who keeps things neat and tidy.¤	Q¤	O¤	O¤	O¤	¤	

🔚 Dataset_bfi_2_s.sav [DataSet0] - IBM SPSS Statistics Data Editor

											<u> </u>
	Name	Type	VVidth	Decimals	Label	Values	Missing	Columns	Align	Measure	4
1	BFI_2_5_1	Numeric	8	0	I am someone who tends to be quiet.	{1, Disagree	9999	8	E Right	Ordinal	N II
2	BFI_2_5_2	Numeric	8	0	I am someone who is compassionate, has a soft heart.	{1, Disagree	9999	8	E Right	Ordinal	N II
3	DFI_2_5_3	Numeric	0	0	r am someone who tends to be disorganized.	{1, Disagree	9999	0	E Right	Ordinal	
4	BFI_2_5_4	Numeric	8	0	I am someone who worries a lot.	{1, Disagree	9999	8	E Right	Ordinal	N II
5	BFI_2_5_5	Numeric	8	0	I am someone who is fascinated by art, music, or literature.	{1, Disagree	9999	8	Right	Ordinal	- In
7	DFI_2_3_0	Numeric	0	0	r am someone who is dominant, acts as a reader.	{1, Disagree	9999	0	E Right	Ordinal	
/	BFI_2_5_7	Numeric	8	0	I am someone who is sometimes rude to others.	{1, Disagree	9999	8	Right	Ordinal	S In
8	BFI_2_S_8	Numeric	8	0	I am someone who has difficulty getting started on tasks.	{1, Disagree	9999	8	Right	Ordinal	N IN
9	BFI_2_5_9	Numeric	8	0	I am someone who tends to feel depressed, blue.	{1, Disagree	9999	8	Hight	Ordinal	N IN
10	BFI_2_S_10	Numeric	8	0	I am someone who has little interest in abstract ideas.	{1, Disagree	9999	8	Hight	Ordinal	N IN
11	BFI_2_S_11	Numeric	8	0	I am someone who is full of energy.	{1, Disagree	9999	8	Hight	Ordinal	N IN
12	BFI_2_S_12	Numeric	8	0	I am someone who assumes the best about people.	{1, Disagree	9999	8	Right	Ordinal	N In
13	BFI_2_S_13	Numeric	8	0	I am someone who is reliable, can always be counted on.	{1, Disagree	9999	8	Right	Ordinal	N In
14	BFI_2_S_14	Numeric	8	0	I am someone who is emotionally stable, not easily upset.	{1, Disagree	9999	8	Right	Ordinal	N In
15	BFI_2_S_15	Numeric	8	0	I am someone who is original, comes up with new ideas.	{1, Disagree	9999	8	Right	Ordinal	N In
16	BFI_2_S_16	Numeric	8	0	I am someone who is outgoing, sociable.	{1, Disagree	9999	8	Right	Ordinal	N In
1/	BFI_2_S_17	Numeric	8	0	I am someone who can be cold and uncaring.	{1, Disagree	9999	8	Right	Ordinal	N In
18	BFI_2_S_18	Numeric	8	0	I am someone who keeps things neat and tidy.	{1, Disagree	9999	8	E Right	Ordinal	N In
19	BFI_2_S_19	Numeric	8	0	I am someone who is relaxed, handles stress well.	{1, Disagree	9999	8	E Right	Ordinal	N In
20	BFI_2_S_20	Numeric	8	0	I am someone who has few artistic interests.	{1, Disagree	9999	8	E Right	Ordinal	N In
21	BFI_2_S_21	Numeric	8	0	I am someone who prefers to have others take charge.	{1, Disagree	9999	8	E Right	Ordinal	N In
22	BFI_2_S_22	Numeric	8	0	I am someone who is respectful, treats others with respect.	{1, Disagree	9999	8	Right Right	Ordinal	🔪 In
23	BFI_2_S_23	Numeric	8	0	I am someone who is persistent, works until the task is fi	{1, Disagree	9999	8	E Right	Ordinal	💊 In
24	BFI_2_S_24	Numeric	8	0	I am someone who feels secure, comfortable with self.	{1, Disagree	9999	8	I Right	I Ordinal	💊 In
25	BFI_2_S_25	Numeric	8	0	I am someone who is complex, a deep thinker.	{1, Disagree	9999	8	I Right	I Ordinal	💊 In
26	BFI_2_S_26	Numeric	8	0	I am someone who is less active than other people.	{1, Disagree	9999	8	I Right	Ordinal	💊 In
27	BFI_2_S_27	Numeric	8	0	I am someone who tends to find fault with others.	{1, Disagree	9999	8	I Right	📲 Ordinal	ゝ In
28	BFI_2_S_28	Numeric	8	0	I am someone who can be somewhat careless.	{1, Disagree	9999	8	🔳 Right	📲 Ordinal	💊 In
29	BFI_2_S_29	Numeric	8	0	I am someone who is temperamental, gets emotional easi	{1, Disagree	9999	8	🔳 Right	Ordinal	💊 In
30	BFI_2_S_30	Numeric	8	0	I am someone who has little creativity.	{1, Disagree	9999	8	🔳 Right	Ordinal	💊 In
31											
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Data View Variable View



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1. What do I need to do right after data collection (scale scores)?

Data View Variable View

SPSS: BFI-2-S example/variable view mode – label (item text)

ta Dataset bfi 2 s.sav [DataSet0] - IBM SPSS Statistics Data Editor File Edit View Data Transform Analyze Graphs Utilities Extensions Window Help Name Width Decimals Labe Values Missing Columns Align Measure Type Right - Ordinal BFI 2 S 1 Numeric 0 am someone who tends to be quiet {1, Disagree.. 9999 8 BFI_2_S_2 Numeric I am someone who is compassionate, has a soft heart {1, Disagree.. 9999 Right Ordinal BFI 2 S 3 I Right J Ordinal Numeric I am someone who tends to be disorganized {1, Disagree.. 9999 BFI_2_S_4 Numeric I am someone who worries a lot {1, Disagree.. 9999 **Right** Ordinal BFI 2 S 5 Numerio I am someone who is fascinated by art, music, or literature {1, Disagree.. 9999 Right Ordinal BEI 2 S 6 {1, Disagree. J Ordinal Numeric I am someone who is dominant, acts as a leade 9999 Right J Ordinal BFI 2 S 7 Numeric I am someone who is sometimes rude to others {1, Disagree.. 9999 Right J Ordinal BFI 2 S 8 Numeric I am someone who has difficulty getting started on tasks {1, Disagree... 9999 I Right BFI 2 S 9 Numeric I am someone who tends to feel depressed, blue {1, Disagree.. 9999 Right Ordinal BFI 2 S 10 I am someone who has little interest in abstract ideas {1. Disagree.. 🔳 Right - Ordinal 10 Numeric 9999 11 📲 Ordinal BEI 2 S 11 Numeric I am someone who is full of energy {1, Disagree.. 9999 Right 12 BFI 2 S Numeric I am someone who assumes the best about people {1. Disagree... 9999 🗃 Right Ordinal 12 BFI 2 S 13 0 J Ordinal 13 Numeric I am someone who is reliable, can always be counted or Disagree... 9999 Right 14 BFI 2 S 14 Numerio 0 I am someone who is emotionally stable, not easily upset. Disagree. 9999 Right - Ordinal 15 BEL 2 S 15 0 I am someone who is original, comes up with new ideas 🚟 Right - Ordinal Numeric {1, Disagree... 9999 16 BFI 2 S 16 Numeric 0 I am someone who is outgoing, sociable {1, Disagree... 9999 🚟 Right - Ordinal 17 BFI 2 S 17 Numeric 0 🚟 Right J Ordinal I am someone who can be cold and uncaring {1. Disagree... 9999 8 0 d Ordinal 18 BFI_2_S_18 Numeric I am someone who keeps things neat and tidy. {1, Disagree... 9999 🚟 Right 19 BFI 2 S 19 Numeric I am someone who is relaxed, handles stress well {1. Disagree... 9999 Right J Ordinal 20 0 🗃 Right J Ordinal BFI 2 S 20 Numeric I am comeone who has few artistic interests {1, Disagree... 9999 8 21 BFI 2 S 21 Numeric 0 I am someone who prefers to have others take charge {1. Disagree... 9999 🗃 Right J Ordinal d Ordinal 22 BFI 2 S 22 0 Right Numeric I am someone who is respectful, treats others with respect {1. Disagree... 9999 8 23 BFI 2 S 23 0 🗃 Right J Ordinal Numeric I am someone who is persistent, works until the task is fi {1. Disagree... 9999 24 BFI 2 S 24 Numeric 0 I am someone who feels secure, comfortable with self {1. Disagree... 9999 署 Right J Ordinal 25 BFI 2 S 25 Numeric 0 I am someone who is complex, a deep thinker {1, Disagree... 9999 署 Right J Ordinal 8 26 BFI 2 S 26 Numeric 0 I Right J Ordinal I am someone who is less active than other people {1. Disagree... 9999 27 BFI_2_S_27 0 I Right Ordinal Numeric I am someone who tends to find fault with others {1, Disagree... 9999 28 BFI 2 S 28 I am someone who can be somewhat careless {1. Disagree... 9999 I Right Ordinal Numeric 29 BFI_2_S_29 Numeric I am someone who is temperamental, gets emotional eas {1. Disagree.. 9999 I Right Ordinal 30 BFI 2 S 30 Numeric am someone who has little creativit {1, Disagree... 9999 I Right Ordinal 32 34 36 38 39

Ħ	×	1-⊐-Disagree-strongly¤	2·=∙Disagree∙a·little¤	3·=·Neutral;∙no•opinion¤	4=·Agree·a·little¤	5-=:Agree:strongly¤ ™
1¤	l·am·someone·who·tends·to·be·quiet.¤	⊖¤	⊖¤	⊖¤	⊖¤	
2¤	l·am·someone·who·is·compassionate,·has·a·soft·heart.¤	∩¤	⊖¤	⊖¤	⊖¤	X ¤()
3¤	l·am·someone·who·tends·to·be·disorganized.¤	Q¤	⊖¤	Q¤	Q¤	
4 ¤	l-am-someone-who-worries-a-lot.¤	⊖¤	⊖¤	⊖¤	⊖¤	⊖¤ ¤⊖
5¤	l·am·someone·who·is·fascinated·by·art,·music,·or·literature.¤	⊃¤	⊖¤	⊃¤	⊃¤	⊖¤ ¤
6 ¤	l·am·someone·who·is·dominant,·acts·as·a·leader.¤	⊖¤	⊖¤	⊖¤	⊖¤	⊇¤ ⊠
7¤	I-am-someone-who-is-sometimes-rude-to-others.¤	⊃¤	⊖¤	⊖¤	⊖¤	
8¤	l·am·someone·who·has·difficulty·getting·started·on·tasks.¤	⊃¤	⊖¤	⊖¤	⊖¤	
9 ¤	l·am·someone·who·tends·to·feel·depressed,·blue.¤	⊃¤	⊖¤	⊖¤	⊖¤	⊂¤ ¤
10¤	l·am·someone·who·has·little·interest·in·abstract·ideas.¤	∩¤	⊖¤	⊖¤	⊖¤	⊂¤ ¤
11¤	l·am·someone·who·is·full·of·energy.¤	⊖¤	⊖¤	⊖¤	⊖¤	⊂¤ ¤
12¤	l·am·someone·who·assumes·the·best·about·people.¤	Q¤	⊃¤	⊃¤	⊃¤	⊇¤ ⊠
13¤	l-am-someone-who-is-reliable,-can-always-be-counted-on.¤	⊃¤	⊖¤	⊖¤	⊃¤	¤
14¤	l·am·someone·who·is·emotionally·stable,·not·easily·upset.¤	Q¤	Q¤	Q¤	Q¤	
15¤	l-am-someone-who-is-original,-comes-up-with-new-ideas.¤	⊖¤	⊖¤	⊖¤	⊖¤	C # C
16¤	l·am·someone·who·is·outgoing,·sociable.¤	⊃¤	⊖¤	⊖¤	⊖¤	
17¤	l·am·someone·who·can·be·cold·and·uncaring.¤	Q¤	⊖¤	Q¤	Q¤	
18¤	I am someone who keeps things neat and tidy.¤	∩¤	∩¤	∩¤	⊖¤	

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please choose a number next

BFI-2-S¶



1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/variable view mode – coding scheme

BFI-2-S¶

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please choose a number next to each statement to indicate the extent to which you agree or disagree with that statement.

я	R	1.≕Disagree strongly#	2·≕·Disagree·a·little¤	3.=∙Neutral;•no∙opinion¤	4=•Agree·a·little¤	5-≕.Agree strongly¤ x
1¤	l·am·someone·who·tends·to·be·quiet.¤	⊖¤	⊖¤	⊖¤	⊖¤	⊠¤ ⊠
2 ¤	l·am·someone·who·is·compassionate,·has·a·soft·heart.¤	⊃¤	⊃¤	⊃¤	⊃¤	¤ ¤⊖
3¤	l·am·someone·who·tends·to·be·disorganized.¤	⊂¤	⊖¤	⊃¤	⊃¤	⊠¤ ⊠
4 ¤	l·am·someone·who·worries·a·lot.¤	⊃¤	⊖¤	⊖¤	⊖¤	¤⊙
5¤	l·am·someone·who·is·fascinated·by·art,·music,·or·literature.¤	⊃¤	⊖¤	⊃¤	⊖¤	¤⊙
6 ¤	l·am·someone·who·is·dominant,·acts·as·a·leader.¤	O¤	О¤	⊖¤	⊖¤	¤ ¤⊖
7 ¤	l·am·someone·who·is·sometimes·rude·to·others.¤	⊃¤	⊃¤	⊃¤	⊃¤	¤∩
8¤	$l\text{-}am\text{-}someone\text{-}who\text{-}has\text{-}difficulty\text{-}getting\text{-}started\text{-}on\text{-}tasks.} \begin{tabular}{lllllllllllllllllllllllllllllllllll$	⊂¤	⊖¤	⊃¤	⊖¤	¤∩
9 ¤	l·am·someone·who·tends·to·feel·depressed,·blue.¤	⊃¤	⊖¤	⊃¤	⊖¤	¤⊙
10¤	l·am·someone·who·has·little·interest·in·abstract·ideas.¤	⊖¤	⊖¤	⊖¤	⊖¤	¤⊘
11 E	l·am·someone·who·is·full·of·energy.¤	⊖¤	⊖¤	⊖¤	⊃¤	⊠¤ ¤
12¤	l·am·someone·who·assumes·the·best·about·people.¤	⊖¤	⊖¤	⊃¤	⊖¤	¤⊠
13¤	l·am·someone·who·is·reliable,·can·always·be·counted·on.¤	⊖¤	⊖¤	⊖¤	⊖¤	¤¤⊖
14¤	l-am-someone-who-is-emotionally-stable,-not-easily-upset. X	⊖¤	⊖¤	⊖¤	⊖¤	⊠¤ ⊠
15¤	l·am·someone·who·is·original, comes·up·with·new·ideas.¤	⊖¤	⊖¤	⊖¤	⊖¤	¤¤⊖
16¤	l·am·someone·who·is·outgoing,·sociable.¤	Ο¤	Ö¤	⊖¤	⊖¤	¤ ¤⊖
17r	l·am·someone·who·can·be·cold·and·uncaring.¤	Q¤	O¤	Q¤	Q¤	
18r	l·am·someone·who·keeps·things·neat·and·tidy.¤	⊖¤	O¤	O¤	O¤	¤ ¤

🔄 Dataset_bfi_2_s.sav [DataSet0] - IBM SPSS Statistics Data Editor

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<u>File Edit</u>	<u>V</u> iew <u>D</u> ata	Transform	<u>A</u> nalyze	<u>G</u> raphs <u>U</u> t	ilities	Extensions	Window	Help								
2			~	* 📥 🗐		e 46		🔤 🕗 💽								
	Name	Type	Width	Decimals			Labe	el		Values	Missing	Columns	Align	Measure		Role
1	BFI_2_S_1	Numeric	8	0	l am	someone who	tends to be	quiet.		{1, Disagree	9999	8	Right	Ordinal	>	Input
2	BFI_2_S_2	Numeric	8	0	l am	someone who	is compassi	onate, has a soft heart.		{1, Disagree	9999	8	🔳 Right	Ordinal	>	Input
3	BFI_2_S_3	Numeric	8	0	l am	someone who	tends to be	disorganized.		{1, Disagree	9999	8	🔳 Right	Ordinal	>	Input
4	BFI_2_S_4	Numeric	8	0	l am	someone who	worries a lot			{1, Disagree	9999	8	🔳 Right	Ordinal	>	Input
5	BFI_2_S_5	Numeric	8	0	l am	someone who	is fascinated	l by art, music, or litera	ature.	{1, Disagree	9999	8	🔳 Right	I Ordinal	>	Input
6	BFI_2_S_6	Numeric	8	0	l am	comoono uho	ie dominant	anto ao a loador		M. Disagras	0000	0	= Diabt	ordinal		Input
7	BFI_2_S_7	Numeric	8	0	l am	to Val	ue Label	-						\ \	e	Input
8	BFI_2_S_8	Numeric	8	0	l am	Val		5							`	Input
9	BFI_2_S_9	Numeric	8	0	l am											Input
10	BFI_2_S_10	Numeric	8	0	l am	Males		_								Input
11	BFI_2_S_11	Numeric	8	0	l am	- vaiu	e Labels	5								Input
12	BFI_2_S_12	Numeric	8	0	l am				1							Input
13	BFI_2_S_13	Numeric	8	0	l am	val <u>u</u>	e:							Spelling		Input
14	BFI_2_S_14	Numeric	8	0	l am		· · · · · · · · · · · · · · · · · · ·									Input
15	BFI_2_S_15	Numeric	8	0	l am	Lab	el:									Input
16	BFI_2_S_16	Numeric	8	0	l am	=										Input
17	BFI_2_S_17	Numeric	8	0	l am											Input
18	BFI_2_S_18	Numeric	8	0	l am			1 = "Disagi	ree	strongly"						Input
19	BFI_2_S_19	Numeric	8	0	l am	1		2 - "Dispar		a littla"						Input
20	BFI_2_S_20	Numeric	8	0	l am		<u>A</u> dd	z - Disayi	iee	anue						Input
21	BFI_2_S_21	Numeric	8	0	i am			🗧 3 = "Neutra	al, n	o opinion	1"					input
22	BFI_2_S_22	Numeric	8	0	i am		Change									Input
25	BFI_2_5_23	Numeric	0	0	i am			4 = Agree	a iit	ue						Input
24	BFI_2_5_24	Numeric	0	0	Lam	l l	Pamov	5 = "Agree	stro	nalv"						Input
20	BEL 2 S 26	Numeric	8	0	Lam				00							Input
20	BEL 2 S 27	Numeric	8	0	Lam											Input
28	BEL 2 S 28	Numeric	8	0	Lam											Input
29	BFI 2 S 29	Numeric	8	0	Lam											Input
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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/variable view mode – level of measurement

BFI-2-S¶

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please choose a number next to each statement to indicate the extent to which you agree or disagree with that statement.

я	Ŗ	1.≕Disagree strongly¤	2.≕·Disagree·a·little¤	3.=∙Neutral; no opinion¤	4=•Agree·a·little¤	5-=:Agree∙strongly¤ ¤
1¤	l·am·someone·who·tends·to·be·quiet.¤	⊖¤	⊖¤	⊖¤	⊖¤	⊂¤ ¤
2¤	l·am·someone·who·is·compassionate,·has·a·soft·heart.¤	∩¤	⊖¤	∩¤	⊃¤	¤ ¤⊖
3¤	l•am•someone•who•tends•to•be•disorganized.¤	Q¤	⊖¤	⊃¤	⊃¤	⊠¤ ¤
4 ¤	l·am·someone·who·worries·a·lot.¤	⊖¤	⊖¤	⊖¤	⊖¤	¤ ¤⊖
5¤	l·am·someone·who·is·fascinated·by·art,·music,·or·literature.¤	⊃¤	⊖¤	⊖¤	⊃¤	¤(⊖
6 ¤	l·am·someone·who·is·dominant,·acts·as·a·leader.¤	Q¤	⊖¤	⊖¤	⊖¤	¤ ¤⊖
7¤	l-am-someone-who-is-sometimes-rude-to-others.¤	⊃¤	⊖¤	⊖¤	⊖¤	¤ ¤
8 ¤	l·am·someone·who·has·difficulty·getting·started·on·tasks.¤	∩¤	⊖¤	⊖¤	⊃¤	⊂¤ ¤
9 ¤	l·am·someone·who·tends·to·feel·depressed,·blue.¤	⊃¤	⊖¤	⊖¤	⊖¤	¤ ¤
10¤	l·am·someone·who·has·little·interest·in·abstract·ideas.¤	⊖¤	⊖¤	⊖¤	⊖¤	⊂¤ ¤
11 E	l·am·someone·who·is·full·of·energy.¤	∩¤	⊃¤	⊃¤	⊃¤	¤ ¤⊖
12¤	l·am·someone·who·assumes·the·best·about·people.¤	⊃¤	⊃¤	⊃¤	⊃¤	¤ ¤
13¤	l·am·someone·who·is·reliable,·can·always·be·counted·on.¤	∩¤	⊖¤	$\bigcirc^{\tt p}$	⊖¤	¤⊙
14c	l·am·someone·who·is·emotionally·stable,·not·easily·upset.¤	⊂¤	\bigcirc ¤	⊖¤	⊖¤	⊂¤ ¤
15¤	l·am·someone·who·is·original, comes·up·with·new·ideas.¤	⊖¤	⊖¤	⊖¤	⊖¤	¤ ¤⊖
16¤	l·am·someone·who·is·outgoing,·sociable.¤	⊃¤	⊃¤	⊃¤	⊖¤	¤ ¤⊖
17 r	l·am·someone·who·can·be·cold·and·uncaring.¤	∩¤	Q¤	Q¤	○¤	⊠¤ ¤
18r	l·am·someone·who·keeps·things·neat·and·tidy.¤	Q¤	O¤	O¤	O¤	¤¤⊖

Uataset_b	fi_2_s.sav [DataSe	tu] - IBM SPSS S	statistics D	ata Editor										
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	Name	Type	Wid	th Decimal	S		Lab	el	Values	Missing	Columns	Ali	gn Measure	Role
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2.	DEL 2 C 2	Mumorio	0		Low com		to be	disorganized.	{1, Disagree	9999	8	温 Riji		
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							metim	es rude to others.	{1, Disagree	9999	8	酒 R		
<u>C</u> omma				<u>v</u>	Vidth: 8		lifficult	y getting started on tasks.	{1, Disagree	9999	8	灌R	A Carlo	
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-				Decimal <u>P</u> la	aces: 0		ittle int	erest in abstract ideas.	{1, Disagree	9999	8	着 R	- Contract	-
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C <u>u</u> stom curre	ency						ginal, o	comes up with new ideas.	{1, Disagree	9999	8	漏 R		
Ptring							tgoing,	sociable.	{1, Disagree	9999	8	≣R	Ordinal	
oung							pe cold	and uncaring.	{1, Disagree	9999	8	≣ R		
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							axed, I	handles stress well.	{1, Disagree	9999	8	≣R		
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) The Nume	and type nonor	s the digit gr	oupings	seuing, while	the Result	cied	rs to h	ave others take charge.	{1, Disagree	9999	8	≣ R. ₉ .π		
Numeric n	iever uses dig	it grouping.					pectfu	I, treats others with respect.	{1, Disagree	9999	8	🔳 Right	Ordinal	🦒 Input
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2.5	011_2_0_20	Nomene			run som	conc mio	no complex,	a deep thinker.	{1, Disagree	9999	8	🔳 Right	Ordinal	🦒 Input
26	BFI_2_S_26	Numeric	8	0	I am som	eone who	is less activ	e than other people.	{1, Disagree	9999	8	🔳 Right	Ordinal	🦒 Input
27	BFI_2_S_27	Numeric	8	0	I am som	eone who	tends to fine	d fault with others.	{1, Disagree	9999	8	🔳 Right	Ordinal	💊 Input
28	BFI_2_S_28	Numeric	8	0	I am som	eone who	can be som	ewhat careless.	{1, Disagree	9999	8	🔳 Right	Ordinal	💊 Input
29	BFI_2_S_29	Numeric	8	0	I am som	eone who	is temperar	nental, gets emotional easi	{1, Disagree	9999	8	🔳 Right	I Ordinal	🦒 Input
30	BFI_2_S_30	Numeric	8	0	I am som	eone who	has little cr	eativity.	{1, Disagree	9999	8	🔳 Right	I Ordinal	🦒 Input
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Data View	Variable View													



SPSS: BFI-2-S example/ data view mode

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• Usually, the data view mode contains the participants in rows and the variables in columns



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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ data view mode – one row = one specific participant

🌆 Dataset_bfi_	s.sav [DataSet0] - IBM SPSS Statistics Data Editor	\times
<u>F</u> ile <u>E</u> dit	iew <u>D</u> ata <u>T</u> ransform <u>A</u> nalyze <u>G</u> raphs <u>U</u> tilities Extensions <u>W</u> indow <u>H</u> elp	
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9	gree a little Neutral, no Disagree a Agree a little Disagree s Agree a little Disagree s Agree a little Neutral, no Agree stro Neutral, no Agree stro Neutral, no Agree stro Neutral, no Agree stro Agree a little Neutral, no Agree a little	.ro E
10	eutral, no Agree stro Disagree a Agree stro Disagree a Agree a little Neutral, no Neutral, no Neutral, no Agree stro Neutral, no Disagree stro Neutral, no Disagree stro Neutral, no Disagree stro Neutral, no Disagree stro Neutral, no Neutral, no Agree stro Neutral, no Disagree stro Neutral, no Neutral, no Neutral, no Disagree stro Neutral, no Neutral	.ro N
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22	gree a little Neutral, no Agree stro Disagree s Neutral, no Di	10N
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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ data view mode – one column = one specific variable

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15	Neutral, no Disagree a Neutral, no Disagree a Disagree a Disagree a Agree stro Agree a little Disagree s Neutral, no Agree a little Agree a litt	tro N
16	Disagree s Neutral, no Neutral, no Disagree a Disagree s Agree stro Disagree s Agree stro Disagree s Agree stro Disagree a	эа С
17	Disagree s., Agree stro Neutral, no Agree stro Disagree a Neutral, no Neutral, no Neutral, no Agree stro Agree a little Neutral, no Disagree a Neutral, no Disagree s Neutral, no Neutral, no Neutral, no Disagree s Neutral, no N	little /
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21	Neutral, no., Agree a stro., Disagree a., Neutral, no., Neutral, no., Agree a little Agree a little Disagree s., Agree stro., Disagree s., Agree a little Disagree s., Agree stro., Agree a little Agree a little Agree a little Agree a little Neutral, no., Disagree s., Neutral, no., Neutral, Agree a little Disagree s., Agree stro., Disagree s., Agree a little Agree agre	no C
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SPSS: BFI-2-S example/ data view mode



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• Also in the data view mode, for variables with a coding scheme you can switch between the numbers and the label of a given answer





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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ data view mode – numbers

BFI-2-S¶

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please choose a number next to each statement to indicate the extent to which you agree or disagree with that statement.

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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ data view mode – labels

BFI-2-S¶

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please choose a number next to each statement to indicate the extent to which you agree or disagree with that statement.

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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ to get a complete set of data i strongly recommend...

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SPSS: BFI-2-S example/ dimension score procedure

• The next step in data preparation is to calculate the dimension scores

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- Each dimension consists of some items, and if you sum up the items of a given dimension, you have the dimension score then; sounds easy, right? Maybe, but there could be a little bit of a problem...
- So let's take a look at the first dimension, which is called Extraversion



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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables

Extraversion: Sum up the following items: 1R + 6 + 11 + 16 + 21R + 26R

- To get the dimension score, you will have to sum up the items 1, 6, 11, 21, 26
- However, what does the letter "R" mean, that is linked to the items 1, 21 and 26?



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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables

Extraversion: Sum up the following items: 1R + 6 + 11 + 16 + 21R + 26R

- R means "Reverse" → these items are formulated in a way that is to some point the opposite to items which belong to the same dimension and are not denoted with the letter "R"; for instance:
- Item 21 states: I am someone who is less active than other people
- Item 6 states: I am someone who is full of energy



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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables

Extraversion: Sum up the following items: 1R + 6 + 11 + 16 + 21R + 26R

- The best way to handle this issue is to recode the items 1, 21 and 26 via the SPSS command **Transform** → recode into different variables ...
- ...and tell SPSS to reverse the coding scheme, so that the answer option 5 turns into 1, 4 turns into 2, and so on



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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables

Data View Variable View

Recode into Different Variables...

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University of Applied Sciences 🖙 Dataset bfi 2 s.sav [DataSet0] - IBM SPSS Statistics Data Editor **n** × File Edit View Data Transform Analyze Graphs Utilities Extensions Window Help Compute Variable Programmability Transformation. : BFI_2_S_1 Visible: 30 of 30 Variables 4 Count Values within Cases.. BFI_2_S___BFI_2_S___BFI_2_S_ BFI_2 S BFI 2 S 🔚 Recode into Different Variables × Shift Values 🔤 Recode into Same Variables.. 1 Recode into Different Variables. 2 3 Automatic Recode. Input Variable -> Output Variable: Output Variable 4 Create Dummy Variables 5 Visual Binning.. I am someone w... 6 Continual Binning. Name: 7 I am someone w... Prepare Data for Modeling 8 Rank Cases.. 9 am someone w... 10 Date and Time Wizard. 11 Create Time Series. I am someone w... 12 Replace Missing Values. 13 Random Number Generators. I am someone w... 14 4 Run Pending Transforms 15 I am someone w... 16 17 I am someone w... 18 19 I am someone w... 20 21 I am someone w... 22 I am someone w... 23 24 I am someone w... 25 26 Old and New Values. I am someone w... 27 28 I am someone w... 29 (optional case selection condition) 30 I am someone w 31 32 33 Reset Cancel Help 34 35 36

1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables

Data View Variable View

Recode into Different Variables.

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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables

Data View Variable View

Recode into Different Variables.

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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables



Data View Variable View



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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables



Recode into Different Variables.



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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables

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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables

Extraversion: Sum up the following items: 1R + 6 + 11 + 16 + 21R + 26R

• Now you can tell SPSS to reverse the coding scheme, so that the answer option 5 turns into 1, 4 turns into 2, and so on...



1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables



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Data View Variable View

Recode into Different Variables..



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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables



Data View Variable View

Recode into Different Variables



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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables

Extraversion: Sum up the following items: 1R + 6 + 11 + 16 + 21R + 26R

• You can see then in the variable view mode that SPSS has created the three reverse coded items, which you can use for the calculation of the dimension Extraversion



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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables

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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables

Extraversion: Sum up the following items: 1R + 6 + 11 + 16 + 21R + 26R

Now you are able to build the sum of the six items – use the SPSS command Transform → Compute
 Variable to do so...



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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables

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Data View	Variable View											

Compute Variable...



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University of Applied Sciences 🌆 *Dataset bfi 2 s.sav (DataSet0] - IBM SPSS Statistics Data Editor n × <u>File Edit View Data</u> Transform Analyze Graphs Utilities Extensions Wi ta Compute Variable X Compute Variable 1111 Programmability Transformation. Name Count Values within Cases Numeric Expression: Target Variable: BFI_2_S_1 I am so Shift Values. BFI 2 S 2 I am se = Recode into Same Variables.. BFI 2 S 3 Lam so 4 BFI 2 S 4 Recode into Different Variables. I am so BFI 2 S 5 Matter Automatic Recode. I am so BFI 2 S 6 I am so Create Dummy Variables 📲 I am someone w... 4 BFI 2 S 7 I am so Visual Binning.. I am someone w. BFI_2_S_8 Lam so 8 Coptimal Binning. Function aroup: 9 BFI 2 S 9 I am so 📲 I am someone w... Prepare Data for Modeling 10 BFI_2_S_10 I am so I am someone w... Rank Cases... 11 BFI_2_S_11 I am so Arithmetic 📲 I am someone w... 12 BFI 2 S 12 🛗 Date and Time Wizard. I am so CDF & Noncentral CDF BFI_2_S_13 I am someone w... <= >= 5 Create Time Series. I am so Conversion 14 BFI_2_S_14 I am so Replace Missing Values I am someone w.. 15 BFI_2_S_15 I am so Bandom Number Generators. = ~= 2 3 Current Date/Time I am someone w... 16 BFI_2_S_16 l am so Run Pending Transforms Date Arithmetic 17 BFI 2 S 17 I am so I am someone w.. Date Creation BFI_2_S_18 8 18 Numeric l am sc I am someone w. 19 BFI 2 S 19 Numeric l am so I am someone w. Functions and Special Variables: 20 BFI_2_S_20 Numeric I am so 8 Delete 21 BFI 2 S 21 Numeric 0 I am sc 📲 I am someone w. 22 BFI 2 S 22 Numeric 0 8 I am so 📕 I am someone w. 23 BFI_2_S_23 Numeric 0 I am so I am someone w. 24 BFI 2 S 24 Numeric 0 Lam so I am someone w. 25 BFI 2 S 25 Numeric 0 I am so 26 BFI 2 S 26 Numeric I am so I am someone w. 27 BFI_2_S_27 Numeric I am so I am someone w. 28 BFI 2 S 28 Numeric I am so I am someone w. 29 BFI 2 S 29 Numeric I am so 30 BFI_2_S_30 Numeric I am so Lam someone w 31 BEL 2 S 1 R Numeric 32 BFI_2_S_21_R Numeric (optional case selection condition) 33 BFI 2 26 R Numeric 34 <u>R</u>eset Cancel Help 36 38 39

1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables

Data View Variable View



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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables





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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure – reverse coded variables

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1. What do I need to do right after data collection (scale scores)?

SPSS: BFI-2-S example/ dimension score procedure

- So we have calculated the respective score for the dimension extraversion you will have to do these steps for each of the remaining dimensions
- Note: it could be that a scale do not have any items which are needed to be reverse scored then you have nothing to do in this regard!
- If you have calculated all of your relevant dimension scores, you are ready for data analysis the first thing to do with respect to data analysis is to get some descriptive statistics!



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2. What are descriptive statistics and which of them do I need?

Step 2: Describe your data

Definition

- Descriptive means that you want to describe your sample dataset with certain statistical parameters
- Variables with nominal scale => Frequencies and percentages
- Variables with ordinal scale => Frequencies and percent or median, minimum, maximum
- Variables with interval scale => Mean, median, standard deviation, (optionally: minimum, maximum)



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2. What are descriptive statistics and which of them do I need?

Definition

- The following statistics which you will need will be explained:
- 1. Frequency tables providing counts and percentages
- 2. Measures of the central tendency of your collected scores \rightarrow Mean and Median
- 3. Dispersion measures: spread of your collected scores \rightarrow Variance and Standard deviation

1. Frequency tables for nominal and optionally ordinal scaled variables



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Data View Variable View

🔚 *Dataset bfi 2 s.sav (DataSet0) - IBM SPSS Statistics Data Editor

Frequencies





2. Measures of central tendency/ Mean



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• The mean is the sum of all scores of a given variable (or calculated dimension) divided by the number of scores; however, the value of the mean can be influenced quite heavily by extreme scores



2. Measures of central tendency/ Median

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• The median is the middle score when the scores are placed in ascending order; it is not as influenced by extreme scores as the mean, but it is also a little bit less informative (because the calculation of the mean includes all of the scores, whereas the median is built upon the ranking of the scores, but not on the scores itself!)

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2. What are descriptive statistics and which of them do I need?

3. Dispersion measures/variance and standard deviation

- The variance is the average distance of scores from the mean (it is the number of squared errors divided by the number of scores); it tells us about how widely spreaded scores are around the mean
- The standard deviation is the square root of the variance (it is the variance converted back to the original units of measurement of the scores used to compute it); large standard deviations relative to the mean suggest data are widely spread around the mean, whereas small standard deviations suggest data are closely packed around the mean







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3. Dispersion measures/variance and standard deviation

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- So let's take a look at the mean, the median as well as variance and standard deviation for the dimension Extraversion...
- In SPSS, you will find all these statistics using the command:
 Analyze → Descriptive Statistics → Frequencies

Measures of central tendency & dispersion measures in SPSS

🌆 *Dataset bfi 2 s.sav (DataSet0] - IBM SPSS Statistics Data Editor Ð \times File Edit View Data Transform Analyze Graphs Utilities Extensions Window Help Reports . **- H** 1111 Descriptive Statistics Frequencies Visible: 34 of 34 Variables Bayesian Statistics \times BFI_2_S___BFI_2_S___BFI_2_S___BFI_2_S___BFI_2_S___BFI_2_S___ BFI_2_S__BFI_2_S_ BFI_2_S Tables Compare Means Variable(s): Statistics. General Linear Model BFI_2_S_1 Generalized Linear Models Charts. BFI_2_S_2 Mixed Models 4 Correlate BFI_2_S_3 Format. Regression BFI_2_S_4 Loglinear Style ... BFI 2 S 5 Neural Networks 8 BFI 2 S 6 Bootstrap. Classify 9 5 BFI 2 S 7 Dimension Reduction 10 BFI 2 S 8 Scale 11 5 1 Nonparametric Tests BFI_2_S_9 12 5 Forecasting 13 BFI_2_S 10 5 1 14 Survival 2 1 BFI 2 S 11 4 15 Multiple Response BFI 2 S 12 16 Missing Value Analysis 2 2 2 BFI 2 S 13 17 Multiple Imputation 18 BFI_2_S_14 2 5 Complex Samples 19 2 BFI_2_S_15 Simulation. 20 2 2 Quality Control BFI_2_S_16 21 3 3 Spatial and Temporal Modeling... BFI 2 S 17 22 Direct Marketing BFI_2_S_18 23 24 BFI_2_S_19 25 3 BFI 2 S 20 26 3 BFI_2_S_21 27 3 2 5 BFI_2_S_22 28 4 2 29 30 2 Display frequency tables 31 32 Reset Cancel Help 33 34 35 4 2 36 2 4

Data View Variable View

Frequencies...



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2. What are descriptive statistics and which of them do I need?

Measures of central tendency & dispersion measures in SPSS

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Data View Variable View

Measures of central tendency & dispersion measures in SPSS

🌆 *Dataset bfi 2 s.sav (DataSet0] - IBM SPSS Statistics Data Editor Ð \times File Edit View Data Transform Analyze Graphs Utilities Extensions Window Help Reports . **- H** 1111 Descriptive Statistics Frequencies Visible: 34 of 34 Variables Bayesian Statistics \times BFI_2_S___BFI_2_S___BFI_2_S___BFI_2_S___BFI_2_S___BFI_2_S___ BFI_2_S__BFI_2_S_ BFI_2_S Tables Compare Means Variable(s): Statistics. General Linear Model BFI_2_S_1 Generalized Linear Models Charts. BFI_2_S_2 Mixed Models 4 Correlate BFI_2_S_3 Format. Regression BFI_2_S_4 Loglinear Style ... BFI 2 S 5 Neural Networks 8 BFI 2 S 6 Bootstrap. Classify 9 5 BFI 2 S 7 Dimension Reduction 10 BFI 2 S 8 Scale 11 5 1 Nonparametric Tests BFI_2_S_9 12 5 Forecasting 13 BFI_2_S 10 5 1 14 Survival 2 1 BFI 2 S 11 4 15 Multiple Response BFI 2 S 12 16 Missing Value Analysis 2 2 2 BFI 2 S 13 17 Multiple Imputation 18 BFI_2_S_14 2 5 Complex Samples 19 2 BFI_2_S_15 Simulation. 20 2 2 Quality Control BFI_2_S_16 21 3 3 Spatial and Temporal Modeling... BFI 2 S 17 22 Direct Marketing BFI_2_S_18 23 24 BFI_2_S_19 25 3 BFI 2 S 20 26 3 BFI_2_S_21 27 3 2 5 BFI_2_S_22 28 4 2 29 30 2 Display frequency tables 31 32 Reset Cancel Help 33 34 35 4 2 36 2 4

Data View Variable View

Frequencies...



IBM SPSS Statistics Processor is ready Unicode:ON



Measures of central tendency & dispersion measures in SPSS

🌆 *Dataset bfi 2 s.sav (DataSet0] - IBM SPSS Statistics Data Editor File Edit View Data Transform Analyze Graphs Utilities Extensions Window Help ----Reports P **- H** Descriptive Statistics Frequencies Х Visible: 34 of 34 Variables Bayesian Statistics BFI_2_S BFI_2_S__BFI_2_S_ BFI_2_S___BFI_2_S___BFI_2_S___BFI_2_S_ BFI_2_S Tables Compare Means Variable(s): Statistics. General Linear Model Extraversion BFI 2 S 12 Generalized Linear Models Charts.. BFI 2 S 13 Mixed Models 4 Correlate BFI 2 S 14 Format. Regression BFI 2 S 15 Style ... Loglinear BFI_2_S 16 Neural Networks 8 Bootstrap. BFI_2_S_17 Classify 9 Dimension Reduction BFI_2_S_18 10 Scale 11 BFI 2 S 19 5 1 Nonparametric Tests 12 BFI 2 S 20 Forecasting 13 5 1 BFI_2_S_21 14 Survival 2 BFI 2 S 22 * 15 Multiple Response 16 Missing Value Analysis. BFI 2 S 23 2 2 2 17 Multiple Imputation BFI_2_S_24 18 2 5 Complex Samples BFI_2_S_25 19 2 Simulation BFI_2_S_26 20 2 2 Quality Control 21 BFI 2 S 27 3 3 Spatial and Temporal Modeling... 22 BFI 2 S 28 Direct Marketing 23 BFI_2_S_29 24 BFI 2 S 30 25 5 3 26 3 BFI_2_S_1_R 27 2 5 BFI_2_S_21_R 28 4 BFI_2_26_R 29 3 30 2 Display frequency tables 31 32 OK Paste Reset Cancel Help 33 34 35 4 4 36 2

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Measures of central tendency & dispersion measures in SPSS

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Data View Variable View

Frequencies...



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Measures of central tendency & dispersion measures in SPSS

Choose the op Mean, Median deviation (and or Variance, Mini Maximum), click "continue"-butto then in the main the "ok"-button these descrip statistics (SPSS v them in the ou window)

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Measures of central tendency & dispersion measures in SPSS

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How to report?

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- **Example**: The table with the sample descriptive statistics (n=50) of the scores regarding the dimension Extraversion of the BFI-2-S scale shows the following: the mean score is 17.84 (SD = 3.69), whereas the median has a value of 18.
- Note: n = sample size which was used to calculate the statistics; SD = Standard Deviation (usually only the standard deviation is reported, but not the variance)



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3. How do I perform a hypothesis test and what do I do with the p-value?

Remember the last lecture and the examples of hypotheses

- 1. Descriptive questions
 - More than 50% of college students have felt depressed in the last year.
- 2. Comparative questions
 - Millenial adults have different attitudes towards online banking than generation x people. (two-sided; postulated effect without direction)
 - Painkiller A is more effective for headaches than painkiller B. (one-sided; postulated effect with direction)

3. Relationship-based questions

- The higher the income, the greater the job satisfaction. (one-sided; postulated effect with direction)
- There is a relationship between disposable income and self-confidence amongst young adults. (two-sided; postulated effect without direction)
- 4. Causal (comparative or relational) questions
 - There are differences in exam performance depending upon the teaching method used. (two-sided; postulated effect without direction)
 - Age and the length of experience have positive influence on the salaries of professional soccer players. (one-sided; op postulated effect with direction)



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The hypothesis regarding your group task is a relationship-based hypothesis

- 1. Descriptive questions
 - More than 50% of college students have felt depressed in the last year.
- 2. Comparative questions
 - Millenial adults have different attitudes towards online banking than generation x people. (two-sided; postulated effect without direction)
 - Painkiller A is more effective for headaches than painkiller B. (one-sided; postulated effect with direction)

3. Relationship-based questions

- The higher the income, the greater the job satisfaction. (one-sided; postulated effect with direction)
- There is a relationship between disposable income and self-confidence amongst young adults. (two-sided; postulated effect without direction)
- 4. Causal (comparative or relational) questions
 - There are differences in exam performance depending upon the teaching method used. (two-sided; postulated effect without direction)
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The hypothesis regarding your group task is a relationship-based hypothesis

- Usually, a hypothesis test consists of two hypotheses an alternative hypothesis and a null hypothesis
- Alternative hypothesis → the prediction that there will be an effect (in terms of your group task: that there is a relationship between different dimensions)
- Null hypothesis → the reverse of the alternative hypotheses; it states that the predicted effect cannot be detected (in terms of your group task: that there is not a relationship between different dimensions)



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The hypothesis regarding your group task is a relationship-based hypothesis

• The hypothesis test now tests the null hypothesis, or in other words: it is determined how high the probability of the result you found is under the assumption that the null hypothesis is true.

This probability is provided by the p-value.

- If with the assumption that the null hypothesis is true this probability is very low, then we can be very confident that the null hypothesis is not true and we accept the alternative hypothesis.
- Else, we cannot be certain that the alternative hypothesis holds and we have to maintain the null hypothesis.



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3. How do I perform a hypothesis test and what do I do with the p-value?

The hypothesis regarding your group task is a relationship-based hypothesis

- And is there a value for a "very low probability"?
- In the social sciences it is usually determined with a threshold value of $\leq 5\%$ (= significance level).
- If therefore your test result (in terms of your group task: your "relationship" test statistic) has a probability to occur with the assumption of the null hypothesis to be true at 5% or below this threshold, you can accept the alternative hypothesis (it is then called a statistically significant result).
- If therefore your result (in terms of your group task: your "relationship" test statistic) has a probability to occur with the assumption of the null hypothesis to be true above that 5%-threshold, you cannot accept the alternative hypothesis (it is then called a statistically non significant result).

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3. How do I perform a hypothesis test and what do I do with the p-value?

The hypothesis regarding your group task is a relationship-based hypothesis

- And what is such a "very low probability"?
- This probability value of your found results is called the p-value and it informs you whether your result is statistically significant or not:
- Short summary:
- p-value $\leq 5\% \Rightarrow$ statistically significant result
- p-value > 5% → statistically non significant result



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4. What is a correlational analysis and how do I conduct it?



Definition

Correlational research

• ...is a form of research in which you observe what naturally goes on in the world without directly interfering with it

• ...this term implies that data will be analysed so as to look at relationships between naturally occurring variables rather than making statements about cause and effect



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Scatterplot

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- A first hint whether and how two variables relate to each other somehow is by looking at a scatterplot
- A scatterplot is a graph that plots each person's score on one variable against their score on another; it visualizes the relationship between the variables
- Let's look at some examples...



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10 20 30 40 50 60 70 80 90 100 10 20 30 40 50 60 70 80 90 100



Karin Wegenstein, Stefan Dressler

Scatterplot



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4. What is a correlational analysis and how do I conduct it?

Scatterplot

This scatterplot shows a linear positive relationship between the two variables (as the scores in one variable get higher, the scores in the other variable also gets higher)





Karin Wegenstein, Stefan Dressler



Scatterplot

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This scatterplot shows a linear negative relationship between the two variables (as the scores in one variable get higher, the scores in the other variable gets lower)



Karin Wegenstein, Stefan Dressler



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4. What is a correlational analysis and how do I conduct it?

This scatter plot shows that there is no relationship between the variables at all (the data points are distributed randomly here)

Karin Wegenstein, Stefan Dressler

Scatterplot



Scatterplot in SPSS

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- Let's assume we are interested if the dimension Extraversion is correlated to another personality dimension, such as agreeableness (the steps to calculate the dimension scores for agreeableness are already taken)
- The respective pair of hypotheses would therefore be:
 - Alternative hypothesis (H1): There is a relationship between the dimensions Extraversion and Agreeableness.
 - Null hypothesis (H0): There is not a relationship between the dimensions Extraversion and Agreeableness.
- So we look at scatterplot of the two dimensions

Step 3: Visualize your data



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4. What is a correlational analysis and how do I conduct it?

Scatterplot in SPSS

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4. What is a correlational analysis and how do I conduct it?

Scatterplot in SPSS

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4. What is a correlational analysis and how do I conduct it?

Scatterplot in SPSS

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4. What is a correlational analysis and how do I conduct it?

Scatterplot in SPSS

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4. What is a correlational analysis and how do I conduct it?

Scatterplot in SPSS

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4. What is a correlational analysis and how do I conduct it?

Scatterplot in SPSS

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Scatterplot in SPSS

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4. What is a correlational analysis and how do I conduct it?

Scatterplot in SPSS

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Scatterplot in SPSS

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Scatterplot in SPSS

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4. What is a correlational analysis and how do I conduct it?

Scatterplot in SPSS

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Chart Builder.



4. What is a correlational analysis and how do I conduct it?

Scatterplot in SPSS



Simple Scatter of Agreeableness by Extraversion

Extraversion

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4. What is a correlational analysis and how do I conduct it?

Scatterplot in SPSS

But where is the line???? Answer: because we treated our variables as ordinal scaled variables, SPSS does not show a line at all!!

Remember: scale scores are often treated as interval scaled although (strictly speaking) they are ordinal scaled!







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4. What is a correlational analysis and how do I conduct it?

Scatterplot in SPSS

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4. What is a correlational analysis and how do I conduct it?

Scatterplot in SPSS

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4. What is a correlational analysis and how do I conduct it?

Scatterplot in SPSS

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Scatterplot in SPSS

line



Simple Scatter with Fit Line of Agreeableness by Extraversion

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But how can I calculate if the relationship is significant or not????

not be significant)

Test statistic for correlational analysis

- This leads us to the test-statistics which tell you if the relationship is significant or not
- The most prominent two ways to calculate the relationship are...
- 1. Pearson correlation coefficent (denoted as r) \rightarrow is used when
 - ✓ you have interval or ratio variables
 - \checkmark the relationship is presumably linear (=> scatterplot)
 - ✓ no strong outliers, no subgroups (=> scatterplot)



2. Spearman correlation coefficient (denoted as r_s) \rightarrow is used when you have ordinal data and/or the assumptions for computing a Pearson correlation coefficient are not met



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Test statistic for correlational analysis

- Pearson is the favored one (because it is more sensitive than Spearman think back to the difference between the mean and the median it is basically the same case); however, the meaning of them is the same; that is
- ... these correlation coefficients are standardized measures of the relationship between variables
- ... these correlation coefficients have to lie between -1 and +1
- ... a coefficient of + 1 indicates a perfect positive relationship, a coefficient of -1 indicates a perfect negative relationship, and a coefficient of 0 indicates no linear relationship
- ... these correlation coefficients are a commonly used measure of the size of an effect: values of ± 0.1 represent a small effect, ± 0.3 is a medium effect and ± 0.5 is a large effect



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Test statistic for correlational analysis

- With respect to our example and thinking of the assumptions for calculating the **Pearson correlation coefficient** *r* (we strive to use Pearson – see the argument on the previous slide),
- ...at fist we have to think about our dimension scores: are they ordinal or interval data? If we decide that our scores are interval scaled data (and it is to some extent reasonable, because many of the researchers in the scientific community do that), then we have to decide if the assumption of a linear relationship is met and if the distribution of the data allows for computing Pearson's r (no strong outliers that might influence the relationship, no subgroups) by checking the scatter plot.
- ...if we decide that our scores are ordinal scaled data or any of the assumptions for Pearson's r are not met, we conduct the **Spearman correlation analysis** (path 2)

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Pearsons' assumption: Linear relationship

Problem: relationship is non-linear

(check by means of scatterplot)

=> exponential or parabolic or logarithmic or cubic relationship







Pearsons' assumption: No strong outliers (bivariate normality)

Problem: outliers

With outlier: r=0.66, without outlier: r=-0.14





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Pearsons' assumption: No sub groups (bivariate normality)

4. What is a correlational analysis and how do I conduct it?

Problem: sub groups

Effect of confounding factor (e.g. effect of age group on the relationship between shoe size and homeworks)

r=0.87 (!) for all, but small or even negative (r=-0.05, -0.23 and 0.19) for the subgroups





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Test statistic for correlational analysis/ path 1 (Pearson)

- In our example testing the relationship between Extraversion and Agreeableness, all assumptions for computing Pearson's r hold.
- I will use the Pearson correlation coefficient to test for a statistical significant relationship between the two dimensions Extraversion and agreeableness
- SPSS command: Analyze \rightarrow Correlate \rightarrow Bivariate...

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Test statistic for correlational analysis/ path 1 (Pearson)

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Test statistic for correlational analysis/ path 1 (Pearson)

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Data View Variable View

Bivariate...



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Test statistic for correlational analysis/ path 1 (Pearson)

🖬 Dataset bfi 2 s 1.sav [DataSet1] - IBM SPSS Statistics Data Editor File Edit View Data Transform Analyze Graphs Utilities Extensions Window Help A Reports 0 . 10 Descriptive Statistics Name Values Missing Columns Alian Measure Role Type Bavesian Statistics BFI 2 S 1 Numeric 99999 Disagree.. Tables × Bivariate Correlations BFI 2 S 2 Numeric Disagree.. 9999 Compare Means BFI 2 S 3 Disagree... 9999 Numeric General Linear Model BFI 2 S 4 Numeric Disagree.. 9999 Generalized Linear Models Variables: BFI 2 S 5 Numeric , Disagree... 9999 Options. Mixed Models BFI 2 S 6 Diagaraa 0000 I am someone w... Numeric Correlate <u> B</u>ivariate.. BEI 2 S 7 Numeric BFI_2_S_1_R Style .. Regression Rartial... BFI 2 S 8 8 Numeric Loglinear BFI_2_S_21_R Distances.. 9 BFI_2_S_9 Numeric Neural Networks Bootstrap. 10 BFI 2 S 10 Numeric Canonical Correlation BFI_2_26 R Classify BFI_2_S_11 , Disagree... 9999 11 Numeric Dimension Reduction Æ Extraversion 12 BFI 2 S 12 Numeric Disagree... 9999 4 Scale BFI 2 S 13 Disagree... 9999 Numeric 📕 BFI 2 S 7 R Nonnarametric Tests 14 BFI 2 S 14 Numeric Disagree... 9999 BFI_2_S_17_R Forecasting 15 BFI 2 S 15 Numeric Disagree... 9999 16 BFI 2 S 16 Numeric Survival Disagree... 9999 BFI_2_S_27_R 17 BFI 2 S 17 Numeric Multiple Response Disagree... 9999 Agreeableness Disagree... 9999 18 BFI_2_S_18 Numeric 🚧 Missing Value Analysis. 19 BFI 2 S 19 Numeric Disagree... 9999 Multiple Imputation 20 BFI_2_S_20 Disagree... 9999 Numeric Complex Samples Correlation Coefficients 21 BFI 2 S 21 Numeric Disagree... 9999 Simulation. 🗸 Pearson 🔲 Kendall's tau-b 🔲 Spearman 22 BFI 2 S 22 Disagree... 9999 Numeric Quality Control 23 BFI 2 S 23 Disagree... 9999 Numeric Spatial and Temporal Modeling... 24 BFI_2_S_24 Numeric Disagree... 9999 Direct Marketing Test of Significance 25 BFI 2 S 25 Numeric Disagree... 9999 26 BFI 2 S 26 0 {1. Disagree... 9999 Numeric I am someone Two-tailed One-tailed 27 BFI_2_S_27 0 Numeric I am someone {1. Disagree... 9999 28 BFI 2 S 28 0 Lam someone {1, Disagree... 9999 Numeric 29 BFI 2 S 29 Numeric 0 I am someone {1, Disagree. 9999 Flag significant correlations 30 BFI 2 S 30 Numeric 0 I am someone {1, Disagree... 9999 31 BFI 2 S 1 R Numeric 2 None None 32 BFI 2 S 21. 2 None None Numerio Reset Cancel Help 2 33 BEI 2 26 R None None Numeric 34 Extraversion Numeric 0 None None 35 BFI 2 S 7 R Numeric 2 None 13 Right Right I Ordinal 🍾 Input None 36 BFI 2 S 17... Numeric 2 None 14 Right 🗃 📲 Ordinal 🍾 Input None 37 BFI 2 S 27... Numeric 2 None None 14 Right I Ordinal 🥆 Input 38 Agreeablen... None 15 🗃 Right 🛷 Scale S Input Numeric 0 None

Data View Variable View

Bivariate.



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Test statistic for correlational analysis/ path 1 (Pearson)

🖬 Dataset bfi 2 s 1.sav (DataSet11 - IBM SPSS Statistics Data Editor File Edit View Data Transform Analyze Graphs Utilities Extensions Window Help Reports 10 ----Descriptive Statistics Name Values Miss Type Bavesian Statistics BFI 2 S 1 9999 Numeric Disagree... Х Bivariate Correlations Tables BFI 2 S 2 Numeric Disagree.. 9999 Compare Means BFI 2 S 3 Disagree... 9999 Numeric General Linear Model BFI 2 S 4 Numeric Disagree. 9999 Variables: Generalized Linear Models Options... BFI 2 S 5 Numeric , Disagree... 9999 Mixed Models I am someone w... BFI 2 S 6 Disaaraa 0000 Extraversion Numeric Correlate <u> B</u>ivariate.. BEI 2 S 7 Numeric I am someone w., Style ... Regression 🛃 Pa<u>r</u>tial.. Aareeableness BFI 2 S 8 8 Numeric Loglinear I am someone w.. 9 BFI_2_S_9 Numeric Distances.. Neural Networks Bootstrap. 10 BFI 2 S 10 Numeric 📑 Canonical Correlati BFI_2_S_1_R Classify BFI_2_S_11 , Disagree... 9999 11 Numeric Dimension Reduction BFI 2 S 21 R 12 BFI 2 S 12 Numeric Disagree... 9999 * Scale BEL 2 S 13 Disagree... 9999 Numeric BFI_2_26_R Nonnarametric Tests 14 BFI 2 S 14 Numeric Disagree... 9999 Forecasting 15 BEL2 S 15 Numeric Disagree... 9999 BFI_2_S_7_R 16 BFI 2 S 16 Numeric Survival Disagree... 9999 BFI 2 S 17 R 17 BFI 2 S 17 Numeric Multiple Response Disagree... 9999 BFI 2_S_18 Numeric Disagree... 9999 18 🚧 Missing Value Analysis. BFI 2 S 27 R 19 BFI 2 S 19 Numeric Disagree... 9999 Multiple Imputation 20 BFI_2_S_20 Disagree... 9999 Numeric Complex Samples 21 BFI 2 S 21 Numeric Disagree... 9999 Correlation Coefficients Simulation. 22 BFI 2 S 22 Disagree... 9999 Numeric Quality Control 🗹 Pearson 📃 Kendall's tau-b 📃 Spearman 23 BFI 2 S 23 Disagree... 9999 Numeric Spatial and Temporal Modeling... 24 BFI 2 S 24 Numeric Disagree... 9999 Direct Marketing 25 BFI 2 S 25 Numeric Disagree... 9999 26 BFI 2 S 26 0 {1. Disagree... 9999 Test of Significance Numeric I am someone 27 BFI_2_S_27 0 Numeric I am someone {1. Disagree... 9999 Two-tailed One-tailed 28 BFI 2 S 28 0 Lam someone {1, Disagree... 9999 Numeric 29 BFI 2 S 29 Numeric 0 I am someone {1, Disagree... 9999 30 BFI 2 S 30 Numeric 0 I am someone {1, Disagree... 9999 31 BFI 2 S 1 R Numeric 2 None None Flag significant correlations 32 BFI 2 S 21. 2 None None Numerio 2 33 BEI 2 26 R None None Numeric OK Paste Help Reset Cancel 34 Extraversion Numerio 0 None None 35 BFI 2 S 7 R Numeric 2 None None 36 BFI 2 S 17... Numeric 2 None None Ordina - Blan S INDU 37 BFI 2 S 27... Numeric 2 None None 14 Right I Ordinal 🥆 Input 38 15 🗃 Right 🛷 Scale S Input Agreeablen... Numeric 0 None None



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Data View Variable View

Bivariate.



Test statistic for correlational analysis/ path 1 (Pearson)

🖙 Dataset bfi 2 s 1.sav (DataSet1) - IBM SPSS Statistics Data Editor n File Edit View Data Transform Analyze Graphs Utilities Extensions Window Help Reports 10 Descriptive Statistics Name Values Miss Type Bavesian Statistics BFI 2 S 1 9999 Numeric Disagree.. Bivariate Correlations × Tables BFI 2 S 2 Numeric Disagree. 9999 Compare Means BEL 2 S 3 Disagree... 9999 Numeric General Linear Model BFI 2 S 4 Numeric Disagree. 9999 Variables: Generalized Linear Models Options... BEL 2 S 5 Numeric , Disagree... 9999 Mixed Models I am someone w... BEI 2 S 6 Disaaraa 0000 Extraversion Numeric Correlate <u> B</u>ivariate.. BEI 2 S 7 Numeric I am someone w.. Style ... Regression 🛃 Pa<u>r</u>tial.. Aareeableness BEI 2 S 8 8 Numeric Loglinear 📲 I am someone w.. Distances.. 9 BFI_2_S_9 Numeric Neural Networks Bootstrap. 10 BFI 2 S 10 Numeric 📑 Canonical Correlati BFI_2_S_1_R Classify BEL 2 S 11 . Disagree... 9999 11 Numeric Dimension Reduction BFI 2 S 21 R 12 BFI 2 S 12 Numeric Disagree... 9999 * Scale BEL 2 S 13 Disagree... 9999 Numeric BFI_2_26_R Nonnarametric Tests 14 BFI 2 S 14 Numeric Disagree... 9999 Forecasting 15 BEL 2 S 15 Disagree... 9999 BFI_2_S_7_R Numeric 16 BFI 2 S 16 Numeric Survival Disagree... 9999 BFI 2 S 17 R 17 BFI 2 S 17 Numeric Multiple Response Disagree... 9999 BFI 2_S_18 Numeric Disagree... 9999 18 🕰 Missing Value Analysis BFI 2 S 27 R 19 BFI 2 S 19 Numeric Disagree... 9999 Multiple Imputation 20 BFI_2_S_20 Disagree... 9999 Numeric Complex Samples 21 BFI 2 S 21 Numeric Disagree... 9999 Correlation Coefficients Simulation. 22 BFI 2 S 22 Disagree... 9999 Numeric Quality Control 🗹 Pearson 📃 Kendall's tau-b 📃 Spearman Remember the slides with 23 BFI 2 S 23 Disagree... 9999 Numeric Spatial and Temporal Modeling... 24 BFI 2 S 24 Numeric Disagree... 9999 Direct Marketing 25 BFI 2 S 25 Numeric Disagree... 9999 the hypotheses and if 26 BFI 2 S 26 0 {1. Disagree... 9999 Test of Significance Numeric I am someone 27 BFI 2 S 27 0 Numeric I am someone {1. Disagree... 9999 Two-tailed One-tailed 28 BFI 2 S 28 0 Lam someone {1, Disagree... 9999 Numeric these hypotheses are two-29 BFI 2 S 29 Numeric 0 I am someone {1, Disagree... 9999 30 BFI 2 S 30 Numeric 0 I am someone {1, Disagree... 9999 31 BEL2 S 1 B Numeric 2 None None Flag significant correlations sided or one-sided! 2 32 BFI 2 S 21. None None Numerio 2 33 BFI 2 26 R None None Numeric OK Paste Reset Cancel Help 34 Extraversion Numeric 0 None None 35 BFI 2 S 7 R Numeric 2 None None 36 BFI 2 S 17... Numeric 2 None None Ordina - Blan 37 BFI 2 S 27... Numeric 2 None None 14 Right I Ordinal 🥆 Input 38 15 🗃 Right 🛷 Scale S Input Agreeablen... Numerio 0 None None

Data View Variable View





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Test statistic for correlational analysis/ path 1 (Pearson)



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Test statistic for correlational analysis/ path 1 (Pearson)



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Test statistic for correlational analysis/ path 2 (ordinal data \rightarrow Spearman)

- Alternative path: **Spearman correlation** if assumptions for Pearson's correlation do not hold (e.g. ordinal scaled variables, strong outliers ...)
- SPSS command: Analyze \rightarrow Correlate \rightarrow Bivariate...



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4. What is a correlational analysis and how do I conduct it?

Test statistic for correlational analysis/ path 2 (Spearman)

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	Name	Туре	Descriptive Statistics		Values	Missing	Columns	Alian	Measure	Role
1	BFI 2 S 1	Numeric	Bayesian Statistics		1, Disagree	. 9999	8	Contract Right	Ordinal	> Input
2	BEL2 S 2	Numeric	Tables		1 Disagree	9999	8	Bight	Ordinal	> Input
3	BEL2 S 3	Numeric	Compare Means		1 Disagree	9999	8	Bight	Ordinal	> Input
4	BEL2 S 4	Numeric	<u>G</u> eneral Linear Mode	el 🕨	1. Disagree	9999	8	Bight	Ordinal	> Input
5	BEL2 S 5	Numeric	Generalized Linear N	lodels 🕨 🕨	1. Disagree	9999	8	Bight	Ordinal	> Input
6	BEL2 S 6	Numeric	Mi <u>x</u> ed Models	4	1 Discores	0000	-8	Bight	Ordinal	> Input
7	BEL2 S 7	Numeric	<u>C</u> orrelate		<u> B</u> ivariate		8	- Right	Ordinal	> Input
8	BEL 2 S 8	Numeric	Regression	4	Rartial		8	- Right	Ordinal	> Input
9	BEL 2 S 9	Numeric	Loglinear	P	Distances		8	- Right	Ordinal	> Input
9 10	DFL 2 S 10	Numeric	Neural Networks	۰.	Distances		0	- Right	Ordinal	> Input
10	DFI_2_3_10	Numeric	Classify		Canonica	Correlation	0	- Right	Grainal	s input
10	DFI_2_3_11	Numeric	Dimension Reductio	n Þ	1, Disagree		0	- Right	Grainal	s input
12	BFI_2_5_12	Numeric	Scale	•	i, Disagree	. 3333	0	Right	Urdinal	s input
13	BFI_2_S_13	Numeric	Nonnarametric Teetr		1, Disagree	. 9999	8	Right	Urdinal	s input
14	BH1_2_S_14	Numeric	Comparamente rest		1, Disagree	. 9999	8	Right	Ordinal	S Input
15	BFI_2_S_15	Numeric	Forecasting		1, Disagree	. 9999	8	📾 Right	Ordinal	S Input
16	BFI_2_S_16	Numeric	Survival	•	1, Disagree	. 9999	8	Right	Ordinal	🛸 Input
17	BFI_2_S_17	Numeric	Multiple Response	•	1, Disagree	. 9999	8	🚟 Right	I Ordinal	🥆 Input
18	BFI_2_S_18	Numeric	🔣 Missing Value Analys	sis	1, Disagree	. 9999	8	🚟 Right	📲 Ordinal	💊 Input
19	BFI_2_S_19	Numeric	Multiple Imputation	P	1, Disagree	. 9999	8	Right	🚮 Ordinal	🔪 Input
20	BFI_2_S_20	Numeric	Complex Samples	•	1, Disagree	. 9999	8	🚟 Right	📲 Ordinal	💊 Input
21	BFI_2_S_21	Numeric	By Simulation		1, Disagree	. 9999	8	🚟 Right	📑 Ordinal	💊 Input
22	BFI_2_S_22	Numeric	Quality Control	•	1, Disagree	. 9999	8	Right	📑 Ordinal	💊 Input
23	BFI_2_S_23	Numeric	Spatial and Torrest	Modeling	1, Disagree	. 9999	8	🚟 Right	🚮 Ordinal	🔪 Input
24	BFI_2_S_24	Numeric	Spaual and Tempora	armodening 🕨	1, Disagree	. 9999	8	🚟 Right	🚮 Ordinal	S Input
25	BFI 2 S 25	Numeric	Direct Marketing	•	1, Disagree	. 9999	8	Right	Ordinal	S Input
26	BFI 2 S 26	Numeric	8 0	I am someone	{1. Disagree	. 9999	8	I Right	Ordinal	S Input
27	BFI 2 S 27	Numeric	8 0	I am someone	{1. Disagree	. 9999	8	I Right	Ordinal	> Input
28	BEL 2 S 28	Numeric	8 0	I am someone	{1. Disagree	9999	8	Right	Ordinal	> Input
29	BEL 2 S 29	Numeric	8 0	Lam someone	{1 Disagree	9999	8	- Right	Ordinal	> Input
30	BEL 2 S 30	Numeric	8 0	I am someone	1. Disagree	9999	8	- Right	Ordinal	> Input
30	DEL 2 S 1 D	Numeric	0 0	an someone	Nono	None	12	- Right	Ordinal	> Input
31	DEL 2 6 24	Numeric	0 2 9 2		None	None	14	- Right	Ordinal	- input
32	DF1_2_S_21	Numeric	o 2		None	None	14	The regent	Grdinal	- input
33	BF1_2_26_R	Numeric	8 2		None	None	12	Right	Urdinal	s input
34	Extraversion	Numeric	8 0		None	None	14	Right	Scale	> Input
35	BFI_2_S_7_R	Numeric	8 2		None	None	13	Right	Ordinal	S Input
36	BFI_2_S_17	. Numeric	8 2		None	None	14	Right	I Ordinal	S Input
37	BFI_2_S_27	Numeric	8 2		None	None	14	🖷 Right	I Ordinal	🔪 Input
38	Agreeablen	Numeric	8 0		None	None	15	🚟 Right	🥓 Scale	🥆 Input
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Data View Variable View



Test statistic for correlational analysis/ path 2 (Spearman)

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	Name	Туре	Bayesian Statistics		Values M	lissing Colu	mns Align	Measure	Role			
1	BFI_2_S_1	Numeric	Tables	*	1, Disagree 9999	8	🚟 Right	📶 Ordinal	💊 Input			
2	BFI_2_S_2	Numeric	Compare Means	*	1, Disagree 9999							
3	BFI_2_S_3	Numeric	General Linear Mode	el 🕨	1, Disagree 9999	U 🖬 E	livariate Correlat	ions			×	
4	BFI_2_S_4	Numeric	Generalized Linear I	iodels 🕨	1, Disagree 9999	-						
5	BFI_2_S_5	Numeric	Mixed Medels	Noucio F	1, Disagree 9999							
6	BFI_2_S_6	Numeric	Correlate		1 Dissarss 0000				<u>V</u> ariables:		Ontions	
7	BFI_2_S_7	Numeric	Correlate		Bivariate		Lom comeone	M/ 🛋			Options	
8	BFI_2_S_8	Numeric	Regression		🔙 Pa <u>r</u> tial		ram someone	vv			Style	
9	BFI_2_S_9	Numeric	Logiinear	P	🙆 <u>D</u> istances		I am someone	W			otyje	
10	BFI_2_S_10	Numeric	Neural Networks	P	🛨 Canonical Corre	lation	I am someone	W			Destature	
11	BFI_2_S_11	Numeric	Classify	•	1, Disagree 9999						<u>b</u> ootstrap	
12	BFI_2_S_12	Numeric	Dimension Reduction	on 🕨	1, Disagree 9999		I am someone	W				
13	BFI_2_S_13	Numeric	Sc <u>a</u> le	*	1, Disagree 9999		I am someone	w 🕨 🍽				
14	BFI_2_S_14	Numeric	Nonparametric Test	s 🕨	1, Disagree 9999							
15	BFI_2_S_15	Numeric	Forecasting		1, Disagree 9999		i am someone	w				
16	BFI_2_S_16	Numeric	Survival		1, Disagree 9999		I am someone	w				
17	BFI_2_S_17	Numeric	Multiple Response		1, Disagree 9999							
18	BFI_2_S_18	Numeric	🌌 Missing Value Analys	sis	1, Disagree 9999		ram someone	w				
19	BFI_2_S_19	Numeric	Multiple Imputation	× .	1, Disagree 9999		Lam someone	w				
20	BFI_2_S_20	Numeric	Complex Samples		1, Disagree 9999							
21	BFI_2_S_21	Numeric	Simulation		1, Disagree 9999		orrelation Coeffi	cients				
22	BFI_2_S_22	Numeric	Quality Control		1, Disagree 9999		Pearson Kr	ndoll'e tou b [Choormon			
23	BFI_2_S_23	Numeric	Spatial and Tempor	Modeling b	1, Disagree 9999			inualis tau-b	opeannan			
24	BFI_2_S_24	Numeric	Direct Marketing	ar modernig F	1, Disagree 9999							
25	BFI_2_S_25	Numeric	Direct MailZeting		1, Disagree 9999	E Te	est of Significan	ce				
26	BFI_2_S_26	Numeric	8 0	I am someone	{1, Disagree 9999							
27	BFI_2_S_27	Numeric	8 0	I am someone	{1, Disagree 9999		Two-tailed 🔘 🤇	One-tai <u>l</u> ed				
28	BFI_2_S_28	Numeric	8 0	I am someone	{1, Disagree 9999							
29	BFI_2_S_29	Numeric	8 0	I am someone	{1, Disagree 9999							
30	BFI_2_S_30	Numeric	8 0	I am someone	{1, Disagree 9999	✓	lag significant	correlations				
31	BFI_2_S_1_R	Numeric	8 2		None None		_					
32	BFI_2_S_21	Numeric	8 2		None None		[0]	K Paste	Reset Cano	el Heln		
33	BFI_2_26_R	Numeric	8 2		None None			Laste	Cont Cane	en lineip		
34	Extraversion	Numeric	8 0		None None	·						
35	BFI_2_S_7_R	Numeric	8 2		None None	13	🚟 Right	📲 Ordinal	💊 Input			
36	BFI_2_S_17	Numeric	8 2		None None	14	🚟 Right	III Ordinal	💊 Input			
37	BFI_2_S_27	Numeric	8 2		None None	14	🚟 Right	📲 Ordinal	💊 Input			
38	Agreeablen	Numeric	8 0		None None	15	🚟 Right	🛷 Scale	💊 Input			
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Data View Variable View

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4. What is a correlational analysis and how do I conduct it?

Test statistic for correlational analysis/ path 2 (Spearman)

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	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role	
7	BFI_2_S_7	Numeric	8	0	I am someone	{1, Disagree	9999	8	🚟 Right	📲 Ordinal	ゝ Input	
8	BFI_2_S_8	Numeric	8	0	I am someone	{1, Disagree	9999	8	🚟 Right	I Ordinal	ゝ Input	
9	BFI_2_S_9	Numeric	8	0	I am someone	{1, Disagree	9999	8	🚟 Right	I Ordinal	ゝ Input	
10	BFI_2_S_10	Numeric	8	0	I am someone	{1, Disagree	9999	8	Right	J Ordinal	S Input	
11	BFI_2_S_11	Numeric	8	0	I am someone	{1, Disagree	9999	8	🚎 Right	J Ordinal	S Input	
12	BFI_2_S_12	Numeric	8	0	I am someone	{1, Disagree	9999	8	🚎 Right	J Ordinal	S Input	
13	BFI_2_S_13	Numeric	8	0	I am someone	{1, Disagree	9999	8	Right	Ordinal	S Input	
14	BFI_2_S_14	Numeric	8	0	I am someone	{1, Disagree	9999	8	E Right	Ordinal	S Input	
15	BFI_2_S_15	Numeric	8	0	I am someone	{1, Disagree	9999	8	E Right	Ordinal	S Input	
16	BFI_2_S_16	Numeric	8	0	I am someone	{1, Disagree	9999	8	E Right	Ordinal	S Input	
17	BFI_2_S_17	Numeric	8	0	I am someone	{1, Disagree	9999	8	Right	Ordinal	S Input	
18	BFI_2_S_18	Numeric	8	0	I am someone	{1, Disagree	9999	8	Right	Ordinal	S Input	
19	BFI_2_S_19	Numeric	8	0	I am someone	{1, Disagree	9999	8	Right	Ordinal	S Input	
20	BF1_2_S_20	Numeric	8	0	I am someone	{1, Disagree	9999	8	Right	Ordinal	S Input	
21	BFI_2_5_21	Numeric	8	0	i am someone	{1, Disagree	9999	8	Right	J Ordinal	s input	
22	BFI_2_5_22	Numeric	8	0	i am someone	{1, Disagree	9999	8	Right	J Ordinal	s input	
23	BFI_2_5_23	Numeric	8	0	i am someone	{1, Disagree	9999	8	Right	J Ordinal	s input	
24	BFI_2_5_24	Numeric	0	0	i am someone	{1, Disagree	9999	0	Right	J Ordinal	s input	
25	BFI_2_5_25	Numeric	0	0	I am someone	{1, Disagree	9999	0	Right	Ordinal	s input	
26	DFI_2_5_20	Numeric	0	0	I am someone	{1, Disagree	9999	0	Right	Ordinal	s input	
27	DF1_2_3_27	Numeric	0	0	Lam someone	{1, Disagree	0000	0	Diaht	Ordinal	s input	
20	DF1_2_3_20	Numeric	0	0	Lam someone	{1, Disagree	0000	0	Diaht	- Ordinal	s input	
30	BEL 2 S 30	Numeric	8	0	Lam someone	{1, Disagree	9999	8	- Right	Ordinal	> Input	
31	BEL 2 S 1 P	Numeric	8	2	ram someone	None	None	13	Tright	Ordinal	> Input	
32	BEL 2 S 21	Numeric	8	2		None	None	14	- Right	Ordinal	> Input	
33	BEL 2 26 B	Numeric	8	2		None	None	12	= Right	Ordinal Ordinal	> Input	
34	Extraversion	Numeric	8	0		None	None	14	Right	Scale Scale	> Input	
35	BFI2S7B	Numeric	8	2		None	None	13	Right	- Ordinal	> Input	
36	BFI 2 S 17.	Numeric	8	2		None	None	14	I Right	- Ordinal	> Input	
37	BFI 2 S 27.	Numeric	8	2		None	None	14	Right	Ordinal	> Input	
38	Agreeablen	Numeric	8	0		None	None	15	Right	Scale	S Input	
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4. What is a correlational analysis and how do I conduct it?

Test statistic for correlational analysis/ path 2 (Spearman)

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Data View Variable View



Test statistic for correlational analysis/ path 2 (Spearman)

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Data View Variable View





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4. What is a correlational analysis and how do I conduct it?

Test statistic for correlational analysis/ path 2 (Spearman)

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Data View Variable View

Bivariate...



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4. What is a correlational analysis and how do I conduct it?

Test statistic for correlational analysis/ path 2 (Spearman)



Data View Variable View

Bivariate.



Test statistic for correlational analysis/ path 2 (Spearman)



Data View Variable View

Bivariate.

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Test statistic for correlational analysis/ path 2 (Spearman)

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4. What is a correlational analysis and how do I conduct it?

Test statistic for correlational analysis/ path 2 (Spearman)

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Test statistic for correlational analysis/ path 2 (Spearman)

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How to report?

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- Example:
- Pearson (Path 1): Extraversion was not significantly related to the dimension Agreeableness (r = 0.025, p = 0.861).
- Spearman (Path 2): Extraversion was not significantly related to the dimension Agreeableness ($r_s = 0.001$, p = 0.996)
- If SPSS shows p = 0.000 report it as p < 0,001

Summary

Minimum requirement for result presentation marked yellow

Ste	p 1:
Prepare y	your data

Variable view: Check lables and scales

Data view: Check if all scales scores are complete

Compute dimension scores and set their scales

		<u> </u>	•
X	Step 2: Describe your data	Step 3: Visualize your data	Step 4: Analyze your data
	Variables with nominal scale: Frequency tables (remove cumulative	Variables with nominal scale: bar chart or pie chart	Decide for either Person or Spearman
S	percent)	Variables with ordinal	Choose between one- and two-tailed
	Variables with ordinal scale: Freuqeuncy tables	scale: bar chart	Report and interpret
	Varialbes with interval	scale: histogram	and p-value (sig.)
	scale: <mark>Mean, median,</mark> standard deviation	Relationship between two variables: scatter plot	
	(variance, min, max)		

Bonferroni Correction



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If you perform multiple statistical tests with the same set of variables or testing the same hypothesis, the probability of making an error when accepting the alternative hypothesis increases (the so-called alpha-error or type I error). This is also called the "type I error inflation".

Therefore, you should correct your significance level (the alpha level that we set at $\alpha = 0.05$ by convention). Divide α by the number of tests you perform to receive your new significance level α ⁴.

E.g. if you perform 5 significance tests instead of one, divide alpha (0.05) by 5. Your new significance level is 0.01.

$$\alpha = 0.05$$
; $\alpha' = \frac{0.05}{\# tests}$; in our example: $\alpha' = \frac{0.05}{5} = 0.01$

This is called the Bonferroni correction.

Each p-value of your significance test is now compared to 0.01 an only considered statistically significant if $p \le \alpha'$.



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5. What happens next?

8. What happens next?

Submissions, ZUB-Session and Lecture

- Today: Deadline for qualitative interview guideline submission; Once graded and feedback provided => conduct interviews!
- ZUB: Video about other research methods => Edunet; Please watch this video prior to our class on Thursday!
- Thursday: Role play about ethics in designing research
- Thursday: Deadline for quantitative survey submission (after self-check)
- ... to be continued



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So long and thanks for all the fish.