



## Tutorial 8: Cronbach's Alpha and Reliability Analysis

### Description

In this tutorial we will learn how to conduct a reliability analysis using Cronbach's alpha. Internal consistency reliability is typically estimated using a statistic called **Cronbach's alpha**, which is the average correlation among all possible pairs of items, adjusting for the number of items. In this tutorial we will estimate the Cronbach's alpha of the Purity composite.

**Note.** we are using the datafile ARMF2020\_wave1andwave2.omv

Here are the items (questions asked on survey) for the Purity composite of the Moral Foundations Questionnaire (Graham et al., 2011).

#### Purity:

**MFQ 5** DECENCY - Whether or not someone violated standards of purity and decency

**MFQ 11** DISGUSTING - Whether or not someone did something disgusting

**MFQ 16** GOD - Whether or not someone acted in a way that God would approve of

**MFQ 21** HARMLESSDG - People should not do things that are disgusting, even if no one is harmed.

**MFQ 27** UNNATURAL - I would call some acts wrong on the grounds that they are unnatural.

**MFQ 32** CHASTITY - Chastity is an important and valuable virtue.

### Content

1. Conduct a reliability analysis
2. Interpret a reliability analysis

### STEPS

1. Conduct a reliability analysis
  - a. Go to the Analyze menu and select *Factor* → *Reliability Analysis*.

Scale Analysis

- Reliability Analysis
- Data Reduction
- Principal Component Analysis
- Exploratory Factor Analysis
- Confirmatory Factor Analysis

**Descriptives**

Descriptives	
	purity_comp
N	61
Missing	119
Mean	3.19
Median	3.17
Standard deviation	0.999
Minimum	1.00
Maximum	5.50

**References**

[1] The jamovi project (2021). *jamovi*. (Version 1.6) [Computer Software]. Retrieved from <https://www.iamovi.org>.

[2] R Core Team (2020). *R: A Language and environment for statistical computing*. (Version 4.0) [Computer software]. Retrieved from <https://cran.r-project.org>. (R packages retrieved from MRAN snapshot 2020-08-24).

- b. Then, click each item that comprises the Purity scale (MFQ 5, MFQ 11 MFQ 16 MFQ 21 MFQ 27, MFQ 32) and move them to the 'Items' window.

**Reliability Analysis**

Items

- MFQ5
- MFQ11
- MFQ16
- MFQ21
- MFQ27
- MFQ32

**Scale Statistics**

- Cronbach's  $\alpha$
- McDonald's  $\omega$
- Mean
- Standard deviation

**Item Statistics**

- Cronbach's  $\alpha$  (if item is dropped)
- McDonald's  $\omega$  (if item is dropped)
- Mean
- Standard deviation
- Item-rest correlation

**Reliability Analysis**

Scale Reliability Statistics			
	mean	sd	Cronbach's $\alpha$
scale	3.19	0.999	0.709

[3]

**Item Reliability Statistics**

if item dropped	
	Cronbach's $\alpha$
MFQ5	0.649
MFQ11	0.700
MFQ16	0.637
MFQ21	0.696
MFQ27	0.654
MFQ32	0.682

- c. Under the *Scale Statistics* list on the left of the dialog, notice that "Cronbach's" is selected, and add "Mean" and "Standard Deviation" to the list of selections.

- d. Under the *Item Statistics* label below the list of items, select Cronbach's  $\alpha$  (if item is dropped).
- e. Remember, Jamovi is interactive. So any changes you make in the analysis on the left are instantly shown in the results on the right.

## 2. Interpret a reliability analysis

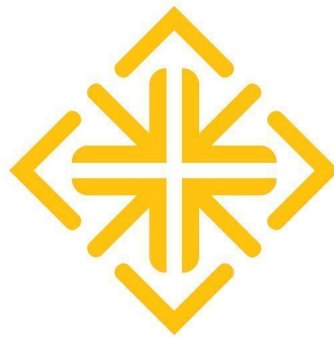
- a. We can see that the Cronbach's alpha for the Purity scale is .709.
- b. The item reliability statistics tells us that dropping any of the items does not increase the reliability of the scale and therefore we should retain all of them. Ideally For psychological constructs you want your scale reliability (Cronbach's alpha) to be above .70.
- c. If you do not get reliability of .70 or above you can review the Item Reliability Statistics table to decide which item may be dropped to improve reliability and redo the reliability analysis to revisit your options for improvement or to obtain a final reliability measure.

-----END TUTORIAL-----

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