

Internal Consistency

The purpose of this exercise is to develop proficiency with assessing internal consistency for a set of items.

Linked next to this exercise on the course web page are the data for this activity. The full link is also provided below.

<http://www.bwgriffin.com/gsu/courses/edur9131/2018spr-assignments/04-internal-consistency-data.pdf>

The data are responses from 19 students who completed the “Dissertation Process Survey.”

Internal Consistency Data

Note that there are 10 items on this questionnaire. The even numbered items (2, 4, 6, 8, and 10) were designed to measure anxiety toward the dissertation process. The odd numbered items were designed to measure self-efficacy toward the dissertation process.

What to do:

- (a) Calculate internal consistency for anxiety items, and scale statistics (e.g., alpha if item removed, item-total correlations).
- (b) Examine these items (carefully review wording of each item and examine item analysis statistics) and determine if any should be dropped.
- (c) If some are dropped, recalculate internal consistency and re-examine the remaining items.
- (d) Repeat these steps as necessary until the final sub-set of the items is obtained. Once the final set of items is obtained, explain why any items were removed, and interpret the alpha that was finally obtained.
- (e) Repeat the process described above for the self-efficacy items.

What to submit for this exercise:

Nothing to submit; answers are provided. Compare your answers with those provided.

Answers are provided below. Please attempt to complete this activity before viewing answers so you can assess better your reasoning with internal consistency.

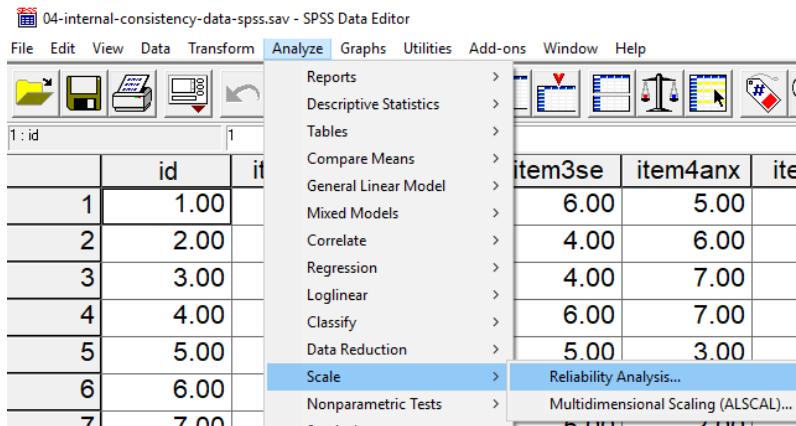
Answers

SPSS data for this activity can be found here:

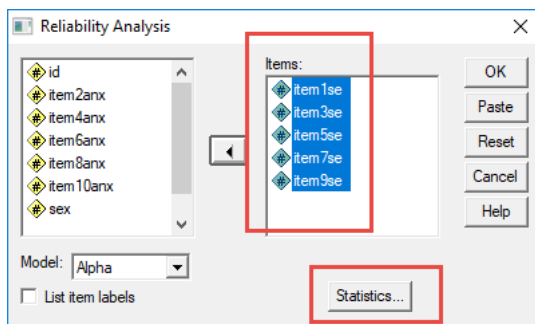
<http://www.bwgriffin.com/gsu/courses/edur9131/2018spr-assignments/04-internal-consistency-data-spss.sav>

1. Dissertation Self-efficacy

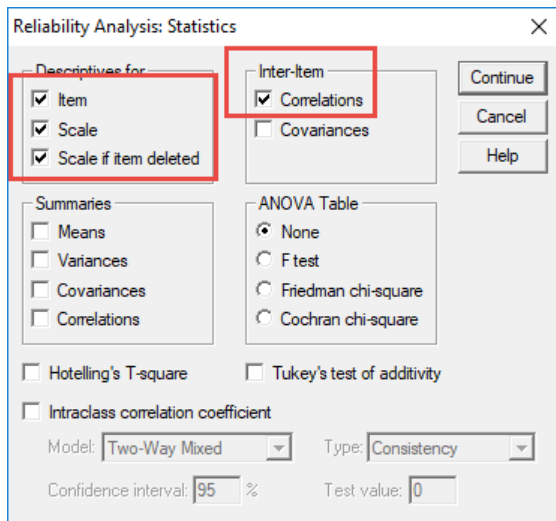
SPSS Commands: **Analyze**→**Scale**→**Reliability Analysis**



Move self-efficacy items (odd numbered items) to the Items box; then click on **Statistics** button.



Select the following item statistics, then click **Continue** then **OK** to obtain results.



SPSS Results

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.783	.796	5

Inter-Item Correlation Matrix

	item1se	item3se	item5se	item7se	item9se
item1se	1.000	.380	.692	.425	.514
item3se	.380	1.000	.524	.303	.634
item5se	.692	.524	1.000	.112	.570
item7se	.425	.303	.112	1.000	.236
item9se	.514	.634	.570	.236	1.000

The covariance matrix is calculated and used in the analysis.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
item1se	22.1053	10.099	.666	.623	.716
item3se	22.9474	9.053	.618	.491	.721
item5se	21.9474	10.164	.611	.630	.730
item7se	23.4737	10.596	.328	.319	.825
item9se	22.7895	8.842	.650	.504	.709

Step 1

- Odd numbered items measure self-efficacy
- $\alpha = .783$
- Correlations among items are all positive which is a good sign that items are demonstrating similar response patterns
- Item-total correlations all .60+ except for item 7
- Weakest item-total correlation is item 7 with .328
- If item 7 dropped, alpha increases to $\alpha = .825$
- Item 7 slightly different in wording from others (focus on literature and theories), but item 7 represents a legitimate component of the dissertation process, so removing item 7 could threaten validity of this measure
- no compelling reason to drop item 7 since alpha is not overly affected by inclusion or removal of item 7, and since item 7 appears to be content validity, it will be retained

Step 2

- If item 7 removed, the following results:
- $\alpha = .825$
- Item-total correlations all .6+
- Stop at step 2; alpha level achieved is the highest possible with these data and self-efficacy items, but if item 7 removed, the cost could be lessened validity of the measure for self-efficacy

2. Dissertation Anxiety

Step 1

- Even numbered items measure anxiety
- $\alpha = .871$
- Can stop here, item-total correlations all $.69+$ except item 8 ($.502$), and the alpha obtained demonstrate very good internal consistency
- If item 8 removed, $\alpha = .89$, but little compelling reason to remove item 8 (unless it is redundant or one wishes to reduce number of items on questionnaire)