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Testing the Reliability and Validity of a Proposed Scale

College of Arts, Science & Education

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Introduction

- A survey is employed in most of the academic research studies.
- Some invisible items are to be measured
- An estimation of reliability and validity often encountered researchers in their missions

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Introduction

Continued

- how can be sure that we are certainly measuring what we need to measure ? (associated to validity)

- can we be certain that if we retest again the measurement we will have similar results? (associated to reliability)

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Overview

- **Reliability**
  - **Is one of the most significant components of test quality.**
  - **Involved with the reproducibility, consistency, or an examinee's performance on the test.**
  - **Is the total consistency of a certain measure.**

- **Several types of reliability:**

Test-Retest Reliability, Alternate – Forms Reliability, Split –Half reliability, and Internal Consistency Reliability.

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Overview

Continued

- **Validity**
  - **Is questionably the most vital measures for test quality.**
  - **Tends to whether or not the test measures what it claims to measure.**
  - **Shows how valid is this test for the decision that I need to make.**

- **There are different types of validity: Content validity, convergent validity, discriminant validity, and construct validity.**

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Overview

Continued

- **Young researchers frequently ask the following question:**

  Can we adopt a questionnaire developed by a certain scientist to be used in collecting our data?!

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Reliability & Validity Analysis

- **Accomplish an Internal Consistency Reliability and Construct Validity requires to determine the following measures:**

- **Cronbach's alpha: Measures the degree of internal consistency.**
- **Inter - item Correlation : An acceptable value should be > 0.30**
- **Item-Total correlation: An acceptable value should be > 0.50**
- **Cronbach's alpha if item deleted.**

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Reliability & Validity Analysis

Continued

Table 1. Proposed items to a construct "A "

Construct	Item
A	X1 X2 X3

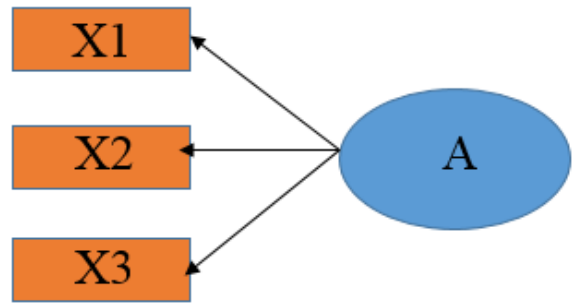

Figure 1: Proposed Scale

Reliability & Validity Analysis

Continued

Table 2 Reliability Statistics

Cronbach's Alpha	# of Items
.806	3

Table 3 Inter-Item Correlation Matrix

	X1	X2	X3
X1	1.000	.423	.168
X2	.423	1.000	.534
X3	.168	.534	1.000

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Reliability & Validity Analysis

Continued

Cronbach's Alpha = .806

Table 4 Item-Total Statistics

	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
X1	.402	.630
X2	.765	.523
X3	.323	.856

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Conclusion & Recommendation

- **Internal – consistency reliability and construct validity tests determine how all factors relate to all other factors and which factors (items) should be remained in the scale.**

- **These factors can be measured through the scores of Cronbach's alpha coefficient, inter - item correlation , item - total correlations , and Cronbach's alpha if item deleted.**

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Conclusion & Recommendation

Continued

- It is recommended for the scientists (who are not statisticians) to adopt and apply a reliable and valid instrument related to their subject area with some modifications in the constructs and items.

- Scientists have to bear in mind that Cronbach's alpha coefficient likely needs at least three items to give a good score.

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Conclusion & Recommendation

Continued

- It is also recommended for the scientist to avoid quick judgement on dropping any item in doubt during reliability and validity analysis; further analysis for these items will make the study significantly pure.
- It is recommended to have a large sample when doing any test. For instance, SPSS tool will run to give significant results only if the sample size is more than 200.

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Questions ?