

Q No.

Exercise No. Solved Problems: Sub Obj

I.

Cronbach's Alpha..

- * It is an estimate of internal consistency (AKA reliability test).
- * $\alpha > 0.3 \Rightarrow$ Questionnaire is good enough & internally consistent.
(Preferred if the value is more than 0.6).
- * $\alpha = 0.65 \Rightarrow 65\%$ reliable.
- * Analyze \rightarrow scale \rightarrow reliability analysis

\downarrow
 drop down,
 (X) Choose correlations option and all options in "descriptives".
- * First, go through the questionnaire & classify the data.

<div style="font-size: 3em;">{</div>	continuous variable. scaled variable. nominal variable ordinal variable.	}	\rightarrow discrete variables.
--------------------------------------	---	---	-----------------------------------

Date: //

ASB-18

Q No.

Exercise No.

Solved Problems: Sub ☐ Obj ☐

scaled - eg: Age (may be continuous also)

ordinal - Divided into groups based on superiority - eg: Rankings, yes/no questions

nominal - Divided into groups but no ranking. eg: Religion, gender.

II.

Basic Analysis

Analyze → descriptive statistics → frequency.

{ * Pie charts (eg: occupation, mother tongue, educational qualib)

{ * Bar graphs (eg: gender, marital status).

Can choose based on convenience.

Yes/no, 0/1 questions are better on bar graphs while questions with a few options are better on a pie chart.

Do NOT use these both for continuous data.

* For continuous / scaled data, use histograms
(eg: Age, income etc).

Normality plot can be plotted & we may
get the skewness coefficient.

* For all the 3 graphs we can get mean,
median, range, variance etc as per our
requirement.

III. Analysis Of Nominal Data

- * If the data is nominal, χ^2 test can be done to check if the variables are independent. (Continuous data may grouped & then χ^2 test may be performed).
- * eg: gender v/s educational qualification.
locality v/s no. of children.
- * Descriptive statistics \rightarrow cross tabs \rightarrow choose a row & column \rightarrow statistics \rightarrow χ^2 independence & correlation.
(χ^2 test tells if 2 variables are independent but won't tell us by how much they differ)
- * Crosstabs table:- Gives values of O_i v/s E_i .
If $E_i > 5 \rightarrow$ use Pearson χ^2 value.
If $E_i < 5 \rightarrow$ use Likelihood value.

* The χ^2 test table :-

↳ Tells the % of cells that have a count of less than 5.

↳ gives χ^2 , p values (expected & calculated)

Choose b/w Pearson, likelihood values appropriately.

↳ gives dof & LOS.

↳ Asymp. sig (2-sided) < 0.05 \Rightarrow Reject H_0 & conclude that variable are dependent.
" p-value

Q No.

Exercise No. Solved Problems: Sub ☐ Obj ☐IVAnalysis of Continuous Data

Eg: Age v/s marital status.
Gender v/s Income.

* Analyze \rightarrow descriptive statistics \rightarrow explore.

(X) * Analyze the stem and leaf plot.

* Descriptive tables - gives μ , σ^2 , range, skewness etc for both variables.

* 3 tests for Normality :-

1) Check histogram for shape.

2) Normal Q-Q plots
- data must lie along / close to the line drawn.

3) Normality tests

(i) Kolmogorov - Smirnov (K-S)

(ii) Shapiro - Wilk (W)

Sig. value = $p > 0.05 \Rightarrow$ Normality holds.

Q No.

Exercise No. Subjective Problems : Level / Section -

V. Analysis of Ordinal Data • (Factor Analysis)

* Analyze \rightarrow Dimension Redⁿ \rightarrow Factor.

Descriptives \rightarrow KMO & Bartlett's Test

- choose unrotated factor solⁿ, scree plot, based on Eigen values > 1 .

Rotation - unrelated data \Rightarrow Varimax.
related data \Rightarrow directed oblimin.

Display rotated solⁿ.

* 1) Correlation Matrix.

- shows % of correlation b/w 2 items.
- perfect correlation (i.e., 1) is called a singularity \rightarrow one of the items should be removed in such cases to avoid duplicacy.
- Determinant Value should be > 0.00001 .
Else, the items are v.v.v unrelated.

2) Pattern Matrix (usually not needed) -
items with similar values can be considered to be similar.

Q No.

Exercise No. Subjective Problems : Level / Section -

3) Scree plot : & ~~Communalities~~
Total Variance Table :-

Scree plot - Values above Eigen Value 1 constitute to most of the variance. Can also be seen from the cumulative column of total variance table.

4) Communalities

Tells the proportion of variance of each variable. Data is good if all are above 0.5.

5) Rotated Component Matrix

- Shows how much variables are related.

6) KMO & Bartlett's Test :-

{ adequacy should be > 0.5
sphericity should be < 0.05

→ If both hold, then, the data is adequate & factor analysis is sufficient & satisfactory.