CRONOBACH'S ALPHA TEST

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Reliability refers to the consistency of the results. A questionnaire used on a similar population that produces similar results can be termed as reliable. Cronobach's alpha is the most common measure of reliability. It is commonly used when we have multiple Likert questions in a survey/questionnaire that form a scale and we wish to determine if the scale is reliable.

CHRONOBACH'S ALPHA TEST

Introduction

Reliability refers to the consistency of the results. A questionnaire used on a similar population that produces similar results can be termed as reliable. Cronobach's alpha is the most common measure of reliability. It is commonly used when we have multiple Likert questions in a survey/questionnaire that form a scale and we wish to determine if the scale is reliable.

Problem

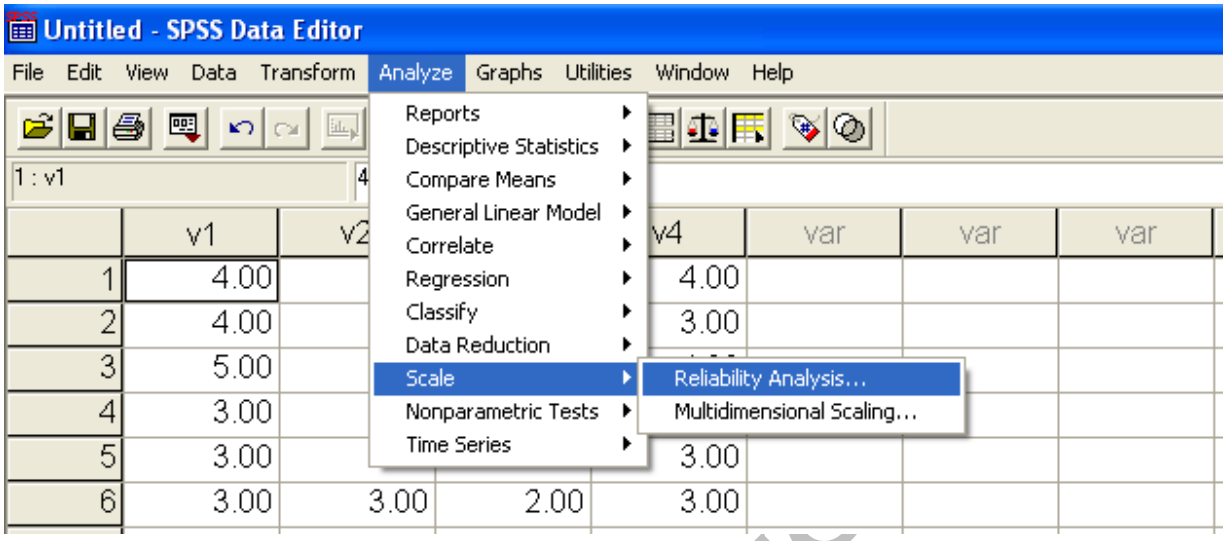
A researcher has devised a questionnaire with 4 questions named as v1, v2, v3, v4 to measure a particular variable. Each question is measurable on a 5-point Likert item from "strongly disagree" to "strongly agree". A Cronobach's alpha is run on a sample size of 20 items to understand whether the questions in this questionnaire (table-1) reliably measure the variable.

Table-1: Likert scale data in Questionnaire

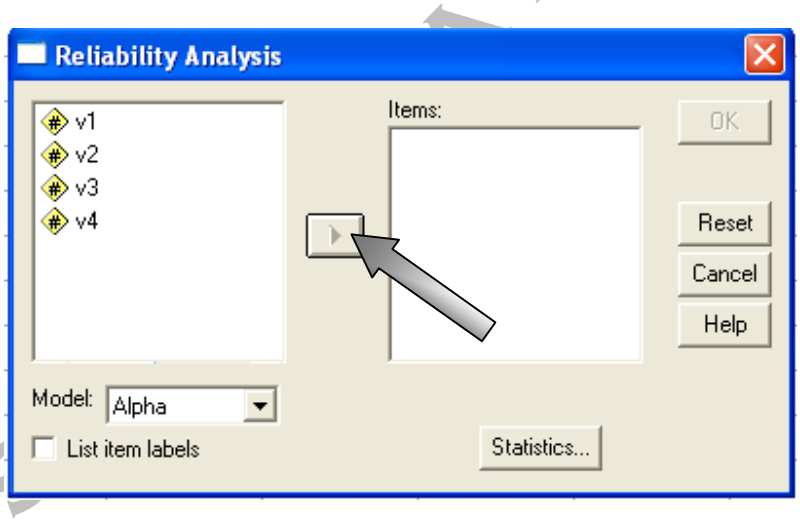
Serial No.	V1	V2	V3	V4
1	4	3	4	4
2	4	3	3	3
3	5	5	5	4
4	3	4	4	5
5	3	4	3	3
6	3	3	2	3
7	2	3	2	2
8	4	5	4	5
9	4	5	3	5
10	5	3	3	5
11	3	2	1	4
12	2	3	4	3
13	3	2	2	2
14	3	3	4	2
15	4	4	4	3
16	4	4	1	4
17	2	3	3	2
18	2	1	1	1
19	3	2	3	3
20	3	4	3	3

Performing the Analysis with SPSS

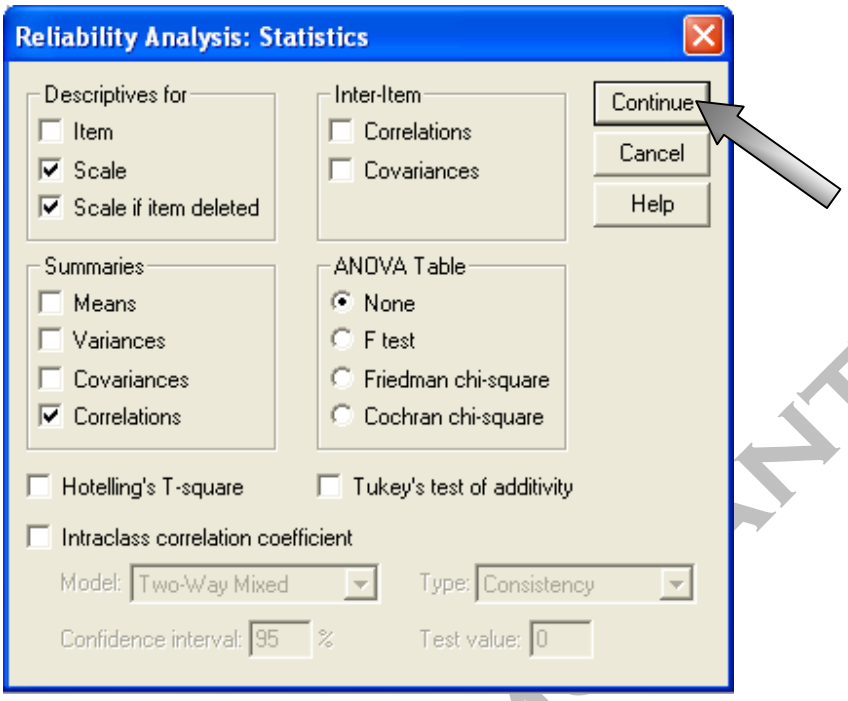
For SPSS Version 11, click on Analyze → Scale → Reliability Analysis. This will bring up the SPSS screen dialogue box as shown below.



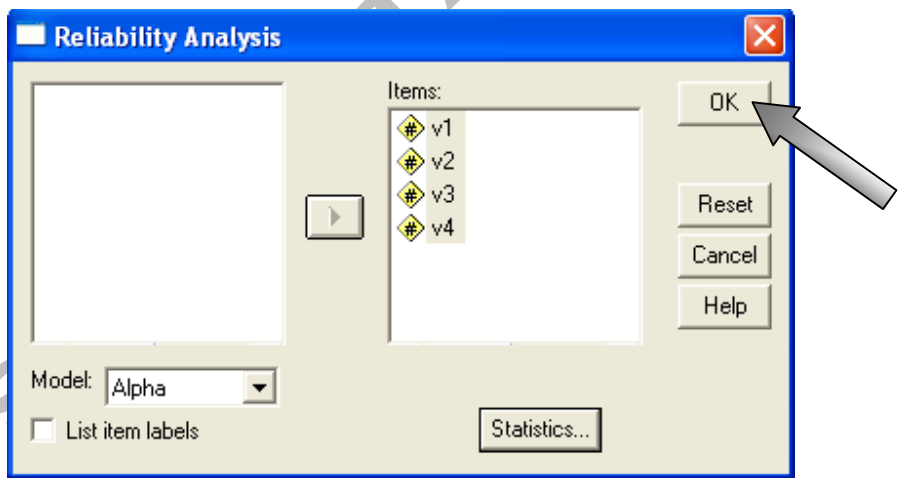
After clicking Reliability Analysis, this will bring up the following SPSS screen dialogue box



Select the variables and click them to move to Items box. Click Statistics and it opens up the following dialogue box.



SELECT SCALE AND SCALE IF ITEM DELETED UNDER 'DESCRIPTIVE FOR' AND CORRELATIONS UNDER 'SUMMARIES' AND THEN CLICK CONTINUE. THIS WILL BRING UP THE FOLLOWING DIALOGUE BOX.



FINALLY CLICK OK TO GET THE OUTPUT.

SPSS OUTPUT

Reliability

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 ****** Method 2 (covariance matrix) will be used for this analysis ******

  R E L I A B I L I T Y   A N A L Y S I S   -   S C A L E   (A L P H A)

        N of Cases =        20.0

                                                    N of
Statistics for        Mean    Variance    Std Dev  Variables
      Scale        12.8500     11.9237     3.4531          4

Inter-item
Correlations          Mean     Minimum     Maximum       Range     Max/Min   Variance
                     .5184       .3246       .6893       .3646      2.1232       .0193


Item-total Statistics

               Scale          Scale      Corrected
               Mean         Variance        Item-          Squared          Alpha
             if Item        if Item         Total         Multiple        if Item
             Deleted        Deleted    Correlation    Correlation        Deleted

V1            9.5500         7.7342        .6497         .5017           .7513
V2            9.5500         6.6816        .7290         .5470           .7042
V3            9.9000         7.5684        .4825         .3328           .8261
V4            9.5500         6.5763        .6589         .5753           .7395


Reliability Coefficients     4 items

Alpha =    .8063           Standardized item alpha =    .8115
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Decision

If the Alpha value for the scale is 0.7 or more then it is considered to be good.

Interpretation

We can see that in the example, Cronobach's alpha is **0.8063**, which indicates a high level of consistency for the scale with this specific sample.

The column "**Alpha if item Deleted**" presents the value of Cronobach's alpha if a particular question is deleted from the scale. We can see that removal of any question except question v3, would result in a lower Cronobach's alpha. Therefore, we should not remove these questions. Removal of question v3 would lead to a small improvement in Cronobach's alpha and we can also see that

THE CORRECTED ITEM-TOTAL CORRELATION VALUE IS ALSO LOW (0.4825) FOR THIS ITEM. THE QUESTION V3 MAY BE DROPPED AND IT IS BASED ON THE RESEARCHER'S REQUIREMENTS.