ANALYSING LIKERT SCALE/TYPE DATA.

1. Motivation.

Likert items are used to measure respondents' attitudes to a particular question or statement. To analyse the data it is usually coded as follows.

- $1 = $ *Strongly disagree*
- $2 = $ *Disagree*
- $3 = $ *Neutral*
- $4 = $ *Agree*
- $5 = $ *Strongly agree*

One must recall that Likert-type data is ordinal data, i.e. we can only say that one score is higher than another, not the *distance* between the points.

2. Basic analysis

With Likert scale data we **cannot** use the mean as a measure of central tendency as it has no meaning *i.e. what is the average of Stronly agree and disagree?* The most appropriate measure of is the mode *the most frequent responses*, or the median. The best way to display the distribution of responses *i.e. (% that agree, disagree etc)* is to use a bar chart.

2.1. **Inference..** To test hypotheses one must initially think **carefully** about the questions you are trying to answer. Once you have identified your hypotheses, you will have a *dependent variable, that which is measured* and your *independent variable/s that which defines your groups.*
Analysis of variance techniques include;

- Mann Whitney test.
- Kruskal Wallis test.

Data may also be combined into say *two* nominal categories **Agree/Accept** and **Disagree/Reject**, which allows us to carry out the;

- Chi-square test.

3. Likert scale.

A Likert scale is composed of a series of four or more Likert-type items that represent *similar* questions combined into a single composite score/variable. Likert scale data can be analyzed as interval data, i.e. the mean is the best measure of central tendency.

3.1. **Inference..** Parametric analysis of ordinary averages of Likert scale data is justifiable by the Central Limit Theorem, analysis of variance techniques incude;

- t-test.
- ANOVA.
- regression procedures

4. Design considerations.

The data analysis decision for Likert items should be made at the questionnaire development stage.

- If you have a series of individual questions that have Likert response options for your participants to answer - then analyze them as Likert-type items i.e. *Modes, medians, and frequencies.*
- If you have a series of Likert-type questions that when combined describe a personality trait or attitude - use means and standard deviations to describe the scale.

5. <u>Distortion.</u>

Likert scales are subject to distortion from several causes;

- Avoidance of using extreme response categories - *central tendency bias.*
- Agreeing with statements as presented *acquiescence bias.*
- Attempt to portray themselves or their organization in a more favorable light *social desirability bias.*

6. <u>Likert scale Regression Analysis.</u>

If your dependent variable is on a likert scale you should run either;

- Ordered logistic regression, or;
- Multinomial logistic regression.

Alternatively collapse the levels of the Dependent variable into two levels and run binary logistic regression.
You should not use linear regression as linear regression requires a continuous dependent variable.

- What information is necessary? At the end of the process, what data do you hope to have? What information is necessary for a decision? Separate "need to know" from "nice to know" information.

7. <u>Other types of Questions.</u>

- Dichotomous i.e. *Yes/No* or *Male/Female.*
- Nominal level of measurement i.e. *1=lawyer, 2=veterinarian, etc..*
- Ranking order of preference.
- Filter or Contingency Questions - i.e. *Have you ever.... if so how often.*