

**Paper – Business Research Methods**  
**Paper Code-MB 202, Unit-III**  
**MBA- Sem-II**

**Dr. James Hussain**  
**Assistant Professor (Guest Faculty)**  
**Email.-mbajames123@gmail.com**

## **TOPIC- CONCEPT OF MEASUREMENT & SCALING**

### **MEASUREMENT**

Measurement is a process of assigning numbers to some characteristics or variables or events according to scientific rules. It is the process observing and recording the observations that are collected as part of a research effort. Measurement means the description of data in terms of numbers – accuracy; objectivity and communication. The combined form of these three is the actual measurement. Accuracy: The accuracy is as great as the care and the instruments of the observer will permit. Objectivity: Objectivity means interpersonal agreement. Where many persons reach agreement as to observations and conclusions, the descriptions of nature are more likely to be free from biases of particular individuals. Communication: Communication is the sharing of research between one person with another one.

### **LEVELS OF MEASUREMENT**

Measurement is important in the process of data collection. Researcher need to measure Several characteristic of variable such as human subject ,animal ,object and event. Level of measurement refers to the relationship among the values that are assigned to the attributes for a variable. It is important because - First, knowing the level of measurement helps you decide how to interpret the data from that variable. When you know that a measure is nominal, then you know that the numerical values are just short codes for the longer names.The most widely used classification of measurement scales are: (a) nominal scale; (b) ordinal scale; (c) interval scale; and (d) ratio scale.

: **(a) Nominal Scale**-The nominal scale (also called dummy coding) simply places people, events, perceptions, etc. into categories based on some common trait. Some data are naturally suited to the nominal scale such as males vs. females, white vs. black vs. blue, and American vs. Asian. The nominal scale forms the basis for such analyses as Analysis of Variance

(ANOVA) because those analyses require that some category is compared to at least one other category. Coding of nominal scale data can be accomplished using numbers, letters, labels, or any symbol that represents a category into which an object can either belong or not belong. In research activities a Yes/No scale is nominal.

**(b) Ordinal Scale-**An ordinal level of measurement uses symbols to classify observations into categories that are not only mutually exclusive and exhaustive; in addition, the categories have some explicit relationship among them.. Most of the commonly used questions which ask about job satisfaction use the ordinal level of measurement. For example, asking whether one is very satisfied, satisfied, neutral, dissatisfied, or very dissatisfied with one's job is using an ordinal scale of measurement.

**(c) Interval Scale-**In the case of interval scale, the intervals are adjusted in terms of some rule that has been established as a basis for making the units equal. The units are equal only in so far as one accepts the assumptions on which the rule is based. Interval scales can have an arbitrary zero, but it is not possible to determine for them what may be called an absolute zero or the unique origin.An interval level of measurement classifies observations into categories that are not only mutually exclusive and exhaustive, and have some explicit relationship among them, but the relationship between the categories is known and exact. This is the first quantitative application of numbers. In the interval level, a common and constant unit of measurement has been established between the categories. For example, the commonly used measures of temperature are interval level scales. We know that a temperature of 75 degrees is one degree warmer than a temperature of 74 degrees, just as a temperature of 42 degrees is one degree warmer than a temperature of 41 degrees. Numbers may be assigned to the observations because the relationship between the categories is assumed to be the same as the relationship between numbers in the number system. For example,  $74+1=75$  and  $41+1=42$ . The intervals between categories are equal.

**(d) Ratio Scale-**The ratio level of measurement is the same as the interval level, with the addition of a meaningful zero point. There is a meaningful and non-arbitrary zero point from which the equal intervals between categories originate. For example, weight, area, speed, and velocity are measured on a ratio level scale. In public policy and administration, budgets and the number of program participants are measured on ratio scales. In many cases, interval and ratio scales are treated alike in terms of the statistical tests

that are applied. A ratio scale is the top level of measurement and is not often available in social research.

## **SCALING OF MEASUREMENT**

Scaling is the branch of measurement that involves the construction of an instrument that associates qualitative constructs with quantitative metric .Stevens stated the simplest and most straightforward definition of scaling... “Scaling is the assignment of objects to numbers according to a rule”. In most scaling, the objects are text statements, usually statements of attitude or belief. People often confuse the idea of a scale and a response scale

## **Thurstone or Equal-Appearing Interval Scaling**

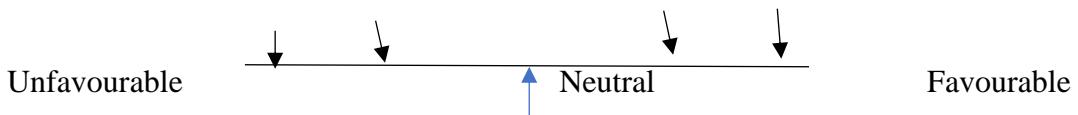
Psychologist Robert Thurstone was one of the first and most productive scaling theorists. He actually invented three different methods for developing a unidimensional scale: the method of equal-appearing intervals; the method of successive intervals; and the method of paired comparisons. The three methods differed in how the scale values for items were constructed, but in all three cases, the resulting scale was rated the same way by respondents

Thurstone developed the method of equal-appearing intervals. This technique for developing an attitude scale compensates for the limitation of the Likert scale in that the strength of the individual items is taken into account in computing the attitude score. It also can accommodate neutral statements. Constructing the Scale Step -

1. Collect statements on the topic from people holding a wide range of attitudes, from extremely favorable to extremely unfavorable. For this example, attitude toward the use of Yaba. Example statements are - It has its place. Its use by an individual could be the beginning of a sad situation. It is perfectly healthy; it should be legalized.
2. Step - 2. Duplicates and irrelevant statements are omitted. The rest are typed on 3/5 cards and given to a group of people who will serve as judges.
3. Step - 3. Originally, judges were asked to sort the statements into eleven (11) stacks representing the entire range of attitudes from extremely unfavourable (1) to extremely favourable (11). The middle stack is for statements which are neither favourable nor unfavourable (6). Only the end points (extremely favourable and extremely unfavourable) and the midpoint are labelled. The assumption is the intervening stacks will represent equal steps along the underlying attitude dimension. With a large number of judges, for example, using a class or some other group to do the preliminary ratings, it is easier to

create a paper-and-pencil version. Rate each of the following statements indicating the degree to which the statement is unfavourable or favourable to yaba use. Do not respond in terms of your own agreement or disagreement with the statements; rather, respond in terms of the judged degree of favourableness or unfavourableness. Place an X in the interval that best reflects your judgment

For example: yaba is OK for most people, but a few people, may have problems with it.



### **LIKERT SCALING-**

A Likert scale is a psychometric scale commonly used in questionnaires, and is the most widely used scale in survey research. When responding to a Likert questionnaire item, respondents specify their level of agreement to a statement. The scale is named after its inventor, psychologist Rensis Likert. The Likert scale can also be used to measure attitudes of people. When responding to a Likert questionnaire item, respondents specify their level of agreement or disagreement on a symmetric agree-disagree scale for a series of statements. Thus, the range captures the intensity of their feelings for a given item. As with the Thurstone scale, the development of a Likert scale takes some effort. An important distinction must be made between a Likert scale and a Likert item. The Likert scale is the sum of responses on several Likert items. Because Likert items are often accompanied by a visual analog scale (e.g., a horizontal line, on which a subject indicates his or her response by circling or checking tick-marks), the items are sometimes called scales themselves. This is the source of much confusion; it is better, therefore, to reserve the term Likert scale to apply to the summated scale, and Likert item to refer to an individual item.

A Likert item is simply a statement which the respondent is asked to evaluate according to any kind of subjective or objective criteria; generally the level of agreement or disagreement is measured. Often five ordered response levels are used, although many psychometricians advocate using seven or nine levels. A recent empirical study found that a 5- or 7- point scale may produce slightly higher mean scores relative to the highest possible attainable score, compared to those produced from a 10-point scale. The format of a typical five-level Likert item is - Strongly disagree; Disagree; Neither agree nor

disagree; Agree; and Strongly agree. After the questionnaire is completed, each item may be analysed separately or in some cases item responses may be summed to create a score for a group of items. Hence, Likert scales are often called summative scales

5-point Traditional Likert Scale

- 1.Strongly agree
- 2.Agree
- 3.Neither agree nor disagree
- 4.Disagree
- 5.Strongly disagree