

Measurement

In everyday life both measurement and evaluation are often used interchangeably ,but in psychological ,sociological and educational research these two have different meaning.

The process of assigning numerals to events ,objects according to certain rule is called measurement.

Taylor(1963) assigning of numerals according to rules .

Nunnally (1970) measurement consist of rules for assigning numbers to objects in such a way as to represent quantities of attributes.By analysing these definition the following properties can be revealed

- 1) In the process of measurement , numerals are assigned according to some rules.
- 2) Measurement is always concerned with certain attributes or features of the object.
- 3) Numerals are also used to represent quantities of the attributes

By evaluation means appraisal or assessment with respect tp some standard may be social ,cultural or scientific.

Levels of measurement (scales of measurements)

1.Nominal scale

- It is the lowest level of measurement
- Numbers are used to name ,identify or classify persons or objects or groups etc.
- It is not a scale and their only to name objects
- In case of nominal measurement admissible statistical operations are counting or frequency ,percentage ,proportion ,mode and coefficient of contingency.
- Addition , subtraction ,multiplication and division are not possible
- Eg;a sample of person being studied may classified in terms of a)hindu b)muslim c)Christian or some samples may classified based on sex or social locality ets

2. ordinal scale

- Numbers denotes the rank order of the object or the individual
- Numbers are assigned from highest to lowest or lowest to highest
- Ordinal scale reflex which person or object is larger or smaller, brighter or duller etc than others.
- It sastisfy the property of magnitude but not equal interval and absolute zero.

3.interval scale

- It includes the characteristics of nominal and ordinal scale of measurement
- The unit of measurement is constant and equal so called as equal interval

- An interval scale the differences between the numbers on the scale reflects the difference in magnitude
- Statistically AM ,SD, Karl pearson coefficient ,T –Test and F-test

4.ratio scale

- It is the highest level of measurement
- It have all the properties of nominal ,ordinal and interval scale

The properties of the scale of measurement

1)*magnitude*; magnitude is defined as the property of moreness .any scale is said to have the property of magnitude ,if it can be said that a particular instance of the attribute represent more,less or equal amounts of the given quantity than does another instants (Mc Call-1994)

2)*equal interval* :the scale has property of equal interval of the differents between any two points at any place on the scale has the same meaning Eg weight-measuring scale difference between 4 kg a.6 kg and 12 kg 14 kg are same

3)*absolute zero*: an absolute zero is said to exist when nothing of the properties being measured exist. for eg: If a doctor is measured the heart rate of a patient and finds that the patient has a heart rate of 0 and has died ,the doctor would conclude that there is no heart rate at all.

Distinction between physical measurement and psychological measurement

Physical measurement comprises of the measurement of objects ,things and is concerned with height, weight length ,size etc .Psychological measurement concerned with measurement of mental health process ,habits ,traits etc.

problems in psychological measurement

reliability

validity

bias

Concept of psycho physics

psycho physics is the studies of relationship between the physical stimuli and people experience of stimuli.

The term psycho physics orginated from G .T Fechner 1801-1887 .he defined an exact science of fundamental relations of dependency between body and mind

He set out to explore the quantitative relationship between the magnitude of sensation occurring in the mind and the magnitude of physical stimulus that produce the sensation.

Threshold –first introduced by John Gerbert in 1824 when he defined the threshold of consciousness –Latin –limen

Threshold refers to the boundary value on a stimulus dimension which separates the stimulus that produce the response from the stimulus that make no response or different response. It is divided into two **absolute threshold** and **difference threshold**

Absolute threshold	Difference threshold
It is the smallest level of stimulus that can be detected	The minimum difference between two stimulus required to detection 50 percent of the time
Usually defines half of the time.	It is the individual capacity to respond to difference in sensitivity
A physical stimulus value which is below that minimal value fails to elicit a response.	Also called just noticeable difference (JND)
A boundary point in sensation, separating sensory experience from no such experience when physical stimulus value reach a particular point.	It is the smallest difference that detected by the subject
It varies from one individual to individual and from one situation to another for the same individual	

Weber's law

It is the first systematic attempt to formulate a principle which governed the relationship between psychological experience and physical stimulus. This law has been focus of psychological experimentation for long time.

Through his experiment, Weber proved that JND (DL) was not a fixed value rather than it increased with the size of the standard stimulus in a linear fashion.

The law is common mathematical statement. Their relationship between the size of the standard stimulus and the size of the JND is technically known as Weber's law. The law may be stated in terms of following equation.

$$\Delta R/R = K$$

$\Delta R = DL$. R is standard stimulus, K is constant

Fechner's law

Fechner's law is derived from Weber's law, it is the indirect method of scale judgment

Fechner was the view that DL for each successive unit or psychological step can be determined by using a constant multiple.

Fechner's law states that the stimulus values and the resulting psychological sensation have a logarithm value so that the physical stimulus increase in arithmetic progression and later increase in geometric progression.

Scaling methods

Theory and methods of scaling defines psychological scaling methods are procedure for constructing scales or the measurement of psychological attributes.

1.Method of average error(mean error)

It is the oldest method of psychophysics. In this method the subject is provide with an S1 (standard stimulus) and a C0 .The C0 is either greater than or less than in intensity S1

The subject is required to adjust C0 until it appears to be equivalent to the S1. The difference between S1 and C0 defines the error in each judgment.

Method of minimal changes (method of limit ,method if JND)

It is a popular method of determine threshold the name method of limits Kracpelin in 1891 because of a series of stimulus end ,when the subjects has reaches that limit where he change his judgment. Or

An experimental technique where by stimuli are presented in ascending and descending magnitude until the participant cannot detect the change ,hens findings the threshold value.

Method of constant stimuli

the method of constant stimuli means that the threshold is determined by presenting the observer with a set of stimuli of which some are above the threshold and of which some are below the threshold but that the set of stimuli are presented in a random order.

Method of pair comparison

One of the very common methods of scaling stimuli are paired and the subject is required to make a comparative judgment by saying which member of each pair preferred or possesses more of the traits being scale.