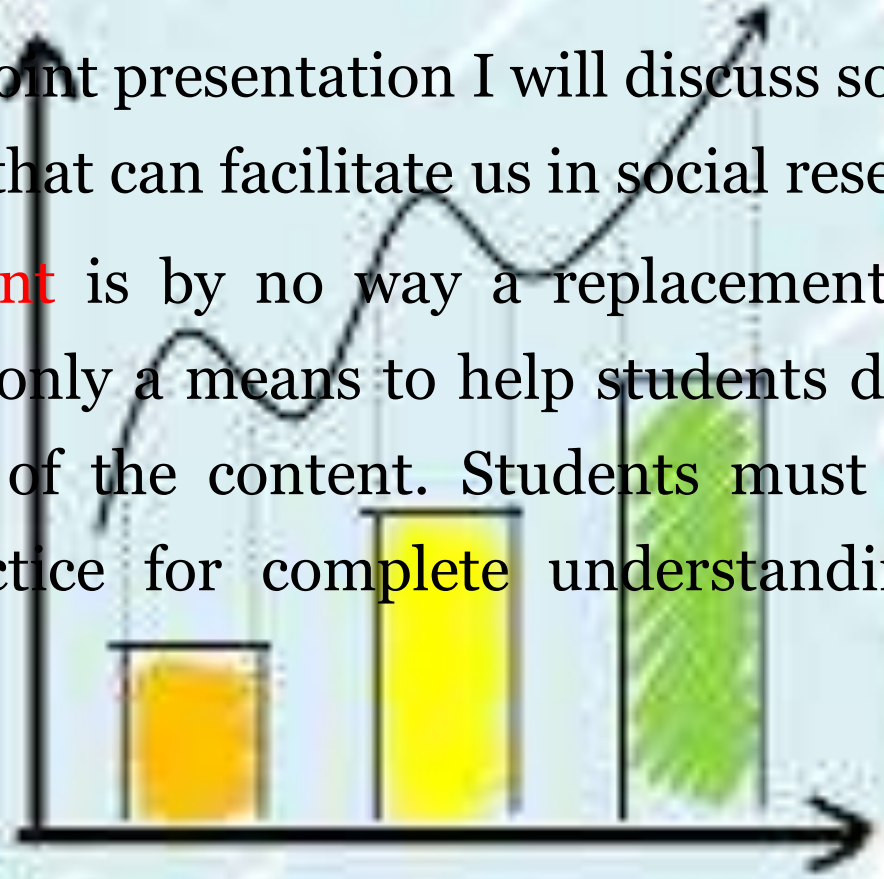
Basic Concepts of Quantitative Research Part II

By
Dr. Sweta, Assistant Professor
Dept. of Sociology
Mahatma Gandhi Central University, Bihar

- The sociological research can be supported by statistical tools to make the research scientific.
- In this power point presentation I will discuss some important basic concepts that can facilitate us in social research.
- The power point is by no way a replacement to text book reading. It is only a means to help students develop a basic understanding of the content. Students must read relevant texts and practice for complete understanding of subject matter.



Level of Measurement

- It is a means to measure the relationship among the *values* that are assigned to the *attributes* for a *variable*.
- "relationship between the numeric values of a variable and the characteristics that those numbers represent" (Lavrakas 2008).
- It was given by Steven (1946).

Levels of Measurement

Data sets need to be classified into different categories.

WHY?

DATA is not all the same. Some are qualitative, some are quantitative.

DATA therefore should be separated and classified to systematically measure, analyze and draw conclusions.

The level of measurement helps you decide how to interpret the data from that variable.

Nominal level of Measurement

- It is the lowest way to categorize data.
- Nominal ‘ in name’. It deals with naming or labeling the data.
- It is qualitative. For example: Favorite snacks.
- It names the attribute uniquely. There is no relationship between the numeric value of the variable and the numbers themselves.
- The numbers are used just to classify data and they have no mathematical value of their own.

Nominal Level of Mesurement

- No rank or order.
- The categories should be mutually exclusive
- The nominal level of measurement is also known as a categorical measure and is considered qualitative in nature.
- While applying statistical research using this level of measurement, one would use the mode, or the most commonly occurring value, as a measure of central tendency.

Example of Nominal Measurement

- In group of 100 Corona + Patients, Patients (Variable).
- The variable can be categorized on the basis on Gender like Male, Female, Others (Attribute).
- Male as M (Value)
- Female as F
- Others as O

Or

- The jersey number of Indian cricket team: 45, 1, 25 etc.
- The values assigned in to the variables help in grouping the data.

Ordinal Level Measurement

- The attributes can be measured in rank-ordered.
- The relationship between order can be studied.
- The relative difference between the value can be studied.
- It helps in comparative analysis of the values assigned to variable
- It is used to measure feelings, opinions, views, perception etc.
- The difference between values is not quantifiable but shows mathematical relationships.
- Median, Spearman Rank-order correlation can be used.

Example of Ordinal Measurement

- For example, If we want take a survey on efforts being taken by local administration towards spread of Corona Virus.
- Rate the steps taken by Administration
- 1 : Satisfactory
- 2: Good
- 3: Very Good
- 4: Extraordinary
- The ranking above is done in two ways quantitatively from 1 to 4 or Qualitatively from Satisfactory to Extraordinary.

Interval Measurement

- The interval uses the standard means of measurement.
- The intervals can be used by researcher for mathematical equation.
- There is an order in the measurement.
- The interval measurement can be used to calculate mean median and mode, also frequency, percentage of variable categories and standard deviation.

Example of Interval Measurement

- Anxiety among Corona affected patients
- 0 to 5,
- 6-10
- Here anxiety level 8 does not indicate twice as anxious as 4.
- 0 might not mean no anxiety.
- Percent of students in each category can be calculated. Mean marks of the class can be calculated, median and mode can be found.
- All other operations of nominal, ordinal measurement can also be applied.

Ratio Level Measurement

- The observation has equal intervals and also absolute zero is meaningful.
- A value of zero can be added.
- This measurement scale satisfies all the four properties of measurement.
- Ratios and fractions can be created.
- All statistical operations can be done

Example of Ratio Level Measurement

- To study amount of incentive received by Corona affected patient
- Sat from 0 rs 5000 rs.
- Or Number of children affected by Corona virus
- It can be from 0 to any number.
- Number of cases of corona infection in Motihari
- It can be 0 to any number.

NOTE

Researcher can use multiple levels of measurement.

For example attitude towards Corana virus infection can be studied at all levels.

- Nominal: Aware or Not Aware
- Ordinal: Awareness can be measured using numbered scale of 1 to 5 1 being least aware 5 being most aware
- Ratio: Number of people aware in an area can be calculated.

Higher level of measurement can be reclassified into lower levels of measurement. But vice versa can not be done.

Reclassification can at times lead to loss of information and inaccuracy in data.

Bibliography

- Lavrakas, P. J. (2008). *Encyclopedia of survey research methods* (Vols. 1-0). Thousand Oaks, CA: Sage Publications, Inc. doi: 10.4135/9781412963947
- https://conjointly.com/kb/levels-of-measurement/
- https://www.thoughtco.com/levels-of-measurement-3026703
- https://www.statisticssolutions.com/data-levels-of-measurement/