GB6013

MEASUREMENT SCALE

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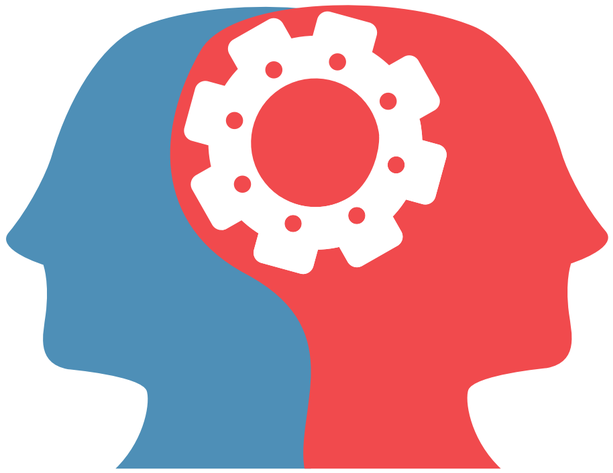
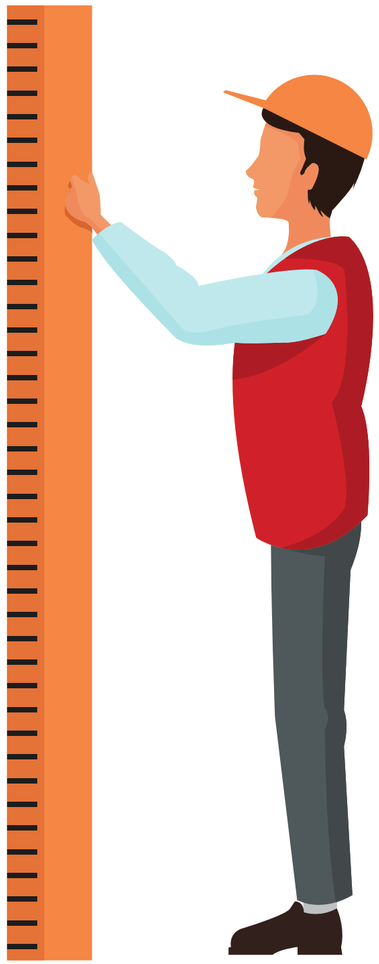
MEASUREMENT



- A measurement takes place when a “test” is given and a “score "is obtained.
- If the test collects quantitative data, the score is a **number**.
- If the test collects qualitative data, the score may be a **phrase or word**.



MEASUREMENT

‘Measurement is the process by which things are differentiated’ (Hopkins & Stanley 1981)

TYPES OF DATA

- Nominal
- Ordinal
- Interval
- Ratio

NOMINAL

- Nominal scales are used for labeling variables, without any quantitative value.
- “Nominal” scales could simply be called “labels.”
- Can be arranged
- E.g.: Marital Status (Single, married, etc.) but no arithmetic operation (addition, subtraction, multiplication or division) can be performed on such variables.

NOMINAL

- Example:
  male = 0, female = 1
  part time = 1, full time = 2

- Can be arranged but no arithmetic operation (addition, subtraction, multiplication or division) can be performed on such variables.

NOMINAL

- a sub-type of nominal scale with only two categories (e.g. male/female) is called “dichotomous.”
- “Nominal” scales could simply be called “labels.”
- Other sub-types of nominal data are “nominal with order” (like “cold, warm, hot, very hot”) and nominal without order (like “male/female”).

ORDINAL

- With ordinal scales, the order of the values is what’s important and significant, but the differences between each one is not really known.

- Example : a #4 is better than a #3 or #2
- but we don’t know–and cannot quantify–how much better it is.

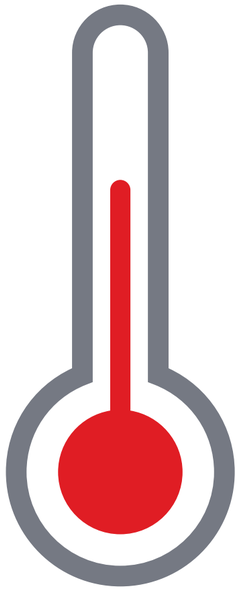
ORDINAL

- Ordinal scales are typically measures of non-numeric concepts like satisfaction, happiness, discomfort, etc.
- Another example, the classificatoin of respondents' income into low-income, middle-income, or high-income.

ORDINAL

- “Ordinal” is easy to remember because is sounds like “order” and that’s the key to remember with “ordinal scales”–it is the order that matters, but that’s all you really get from these.

INTERVAL



- Interval scales are numeric scales in which we know both the order and the exact differences between the values.
- Example: Celsius temperature
- the difference between 60 and 50 degrees is a measurable 10 degrees, as is the difference between 80 and 70 degrees

INTERVAL

- Interval data has no “true zero.”
- Example, there is no such thing as “no temperature,” at least not with celsius.
- In the case of interval scales, zero doesn’t mean the absence of value, but is actually another number used on the scale, like 0 degrees celsius.
- Negative numbers also have meaning. With interval data, we can add and subtract, but cannot multiply or divide.

RATIO

- Ratio scales tell us the exact value between units, AND they also have an absolute zero (absolutely no quantity)–which allows for a wide range of both descriptive and inferential statistics to be applied.

RATIO

- These variables can be meaningfully added, subtracted, multiplied, divided (ratios).
- Central tendency can be measured by mode, median, or mean; measures of dispersion, such as standard deviation and coefficient of variation can also be calculated from ratio scales.

RATIO

- Example people with no work = zero income
- 4 respondents have different sum of money RM65, RM21, RM50, and RM300.
- Can we arrange the data? YES = RM21, RM50, RM65, and RM300.
- Can we do the ratio? YES = RM300 (maximum value)
- An individual who has RM300 own 6 times money from an individual who has RM50

RATIO

- Another example
  age, test score, hours spend for revision etc.

Provides:	Nominal	Ordinal	Interval	Ratio
The “order” of values is known		✔	✔	✔
“Counts,” aka “Frequency of Distribution”	✔	✔	✔	✔
Mode	✔	✔	✔	✔
Median		✔	✔	✔
Mean			✔	✔
Can quantify the difference between each value			✔	✔
Can add or subtract values			✔	✔
Can multiple and divide values				✔
Has “true zero”				✔

REFERENCES

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