

# Encyclopedia of Survey Research Methods

## Interval Measure

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An interval measure is one where the distance between the attributes, or response options, has an actual meaning and is of an equal interval. Differences in the values represent differences in the attribute. For example, the difference between 3 and 4 is the same as the difference between 234 and 235. Interval measures have fixed measurement units, but they do not have a fixed, or absolute, zero point. Because of this, it is technically not correct to declare that something is so many times larger or smaller than something else, although this often is done nonetheless.

Unlike other less sophisticated levels of measurement (e.g. nominal and ordinal measures), interval measures have real meaning. The relationship between the value and attribute is meaningful. For instance, temperature (Fahrenheit or Celsius) can be divided into groups of one degree and assigned a different value for each of the intervals such that anything from 50 degrees to 50.99 degrees has a value of 50. The distance between 50 and 51 degrees has an actual value, one degree. On the other hand, one cannot say that 90 degrees is twice as hot as 45 degrees because there is not an absolute zero.

Within social science research, interval measures are not particularly common because there are only a limited number of attributes that can take on an interval form. When used, they tend to be based on constructed [p. 363 ↓ ] measures like intelligence tests or standardized tests. Another common interval measure is a year. Some within the behavioral sciences use the Rasch model to create interval measures from count data.

It is often common in the research literature to see ordinal measures treated like interval measures. Many ordinal measures have characteristics that suggest that they could be thought of as interval measures. Many subjective rating scales are treated as interval measures. For instance, it is common to see measures using a 7- or 5-point scale, like the "strongly agree," "agree," "disagree" Likert scale battery interpreted as interval. It is easy to see why the interpretation exists, but it is not possible to conclusively state that the different values are exactly equally spaced. That said, many argue that with sufficient testing, it is possible to gain a sense of confidence that the intervals on an ordinal scale are close enough to be treated as though they are equivalent.

Interval measures allow more transformations than nominal and ordinal measures and are generally considered stronger measures, thereby supporting the use of parametric statistical procedures. This means that interval measures must also satisfy the assumptions of nominal and ordinal measures. Therefore, the interval measures 3 and 4 can be thought of in terms of these other measures, such that 4 is considered to have more of the attribute being measured than 3 as is found in ordinal measures. At the same time, a nominal interpretation would suggest that all things assigned 3 would have similar attributes to one another. Because of this, interval measures can always be transformed into ordinal or nominal measures.

Interval measures allow fewer transformations than ratio measures and are considered weaker measures. The central tendency of an interval measure can be represented by its mode, median, or mean. Usually, the mean is considered to provide the most information. Interval measures can also be added and subtracted.

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*See also*

#### Further Readings

Babbie, E. R. (2006). *The practice of social research* (11th ed.) . Belmont, CA: Wadsworth.

Velleman P.R. and Wilkinson L. Nominal, ordinal, interval, and ratio typologies are misleading. *The American Statistician* vol. 47 (1993) pp. 65–72.