

Chapter 8 - Types of Variables

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What this chapter covers

- ▶ Interval variables
- ▶ Ratio variables
- ▶ Other kinds of variables
- ▶ Not quite as distinct as they seem

INTERVAL VARIABLES

Interval variable - a continuous variable where a difference (i.e., interval) means the same thing all the way along the scale, no matter where you start

- ▶ differences in interval variables is often meaningful

For interval variables, the definition of zero is arbitrary.

- ▶ this makes ratios irrelevant, e.g., 50 degrees Celcius is not twice as hot as 100 degrees Celcius

RATIO VARIABLES

Ratio variables - continuous variables where a zero value is not arbitrary

- ▶ differences and ratios of ratio variables can be meaningful

OTHER KINDS OF VARIABLES

Ordinal variables - variables that express rank and therefore a difference does not mean the same thing all the way along the scale

Binomial variables - have two possible outcomes, e.g., dead or alive

Nominal variables - more than two possible values with no relevant ordering in values

NOT QUITE AS DISTINCT AS THEY SEEM

There is lots of ambiguity in these definitions, so don't get too worked up.

Contrary to the book, you won't be tested on this.

Use common sense to think about appropriate graphics/analyses for your data and how you want to interpret the data.

Calculations that are meaningful based on type of variable

| OK TO COMPUTE | NOMINAL | ORDINAL | INTERVAL | RATIO |
|---------------|---------|---------|----------|-------|
|---------------|---------|---------|----------|-------|

| | | | | |
|--|--|--|--|--|
| Frequency distribution | | | | |
| Median and percentiles | | | | |
| Add or subtract | | | | |
| Ratio | | | | |
| Mean, Standard Deviation, Standard Error of Mean | | | | |
| Coefficient of variation | | | | |

Calculations that are meaningful based on type of variable

| OK TO COMPUTE | NOMINAL | ORDINAL | INTERVAL | RATIO |
|--|---------|---------|----------|-------|
| Frequency distribution | Yes | Yes | Yes | Yes |
| Median and percentiles | No | Yes | Yes | Yes |
| Add or subtract | No | No | Yes | Yes |
| Ratio | No | No | No | Yes |
| Mean, Standard Deviation, Standard Error of Mean | No | No | Yes | Yes |
| Coefficient of variation | No | No | No | Yes |

What did we learned

- ▶ Different kinds of variables require different kinds of analyses.
- ▶ Continuous variables can be classified as interval, ratio, or ordinal.