

# Variables in Statistics: Takeaways

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## Concepts

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### VARIABLES

- A property whose values can vary from individual to individual is called a **variable**. For instance, *height* is a property whose value can vary from individual to individual — hence *height* is a variable.
  - Variables can be divided into two categories:
    - **Quantitative** variables, which describe a *quantity*. Examples include: height, age, temperature, time, etc.
    - **Qualitative** variables, which describe a *quality*. Examples include: name, team, t-shirt number, color, zip code, etc.
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### SCALES OF MEASUREMENT

- The system of rules that define how a variable is measured is called **scale of measurement**. We learned about four scales of measurement: nominal, ordinal, interval, and ratio.
- The **nominal** scale is specific to qualitative variables. If a variable is measured on a nominal scale:
  - We can tell whether two individuals are different or not.
  - We can't tell the direction of the difference.
  - We can't tell the size of the difference.
- The **ordinal** scale is specific to quantitative variables. If a variable is measured on an ordinal scale:
  - We can tell whether two individuals are different or not.
  - We can tell the direction of the difference.
  - We can't tell the size of the difference.

- **Interval** and **ratio** scales are both specific to quantitative variables. If a variable is measured on an interval or ratio scale:
  - We can tell whether two individuals are different or not.
  - We can tell the direction of the difference.
  - We can tell the size of the difference.
- For an interval scale, the **zero point** doesn't mean the absence of a quantity — this makes it impossible to measure the difference between individuals in terms of **ratios**. In contrast, for a ratio scale, the zero point means the absence of a quantity, which makes it possible to measure the difference between individuals in terms of ratios.
- Variables measured on an interval and ratio scales can be divided further into:
  - **Discrete** variables — there's no possible intermediate value between any two adjacent values of a discrete variable.
  - **Continuous** variables — there's an infinity of values between any two values of a continuous variable.

## Resources

- [The Wikipedia entry](#) on the four scales of measurement we learned about.
- [A brief intuitive introduction](#) to discrete and continuous variables.

