

Section 1.2: Variables and Data

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10:54 AM

definitions:

a variable is a characteristic that either

- ① changes over time
- ② changes for different individuals under consideration

example of ①: the height of an individual tree measured over a period of years

②: at a particular time, the heights of all trees within a certain area

experimental unit: individual or object on which a variable is measured

univariate data - result of a single variable measured on a single experimental unit

bivariate data - two variables

multivariate data - more than two

qualitative variable - measure is a quality or characteristic

⇒ does not result in numerical value

examples: political party
nationality

quantitative variable - measure is a numerical quantity

examples: height
number of students in a class
shoe size

for quantitative variables, two types:

discrete - can only assume finite or countable number of values
(can't always go halfway between two measurements)

number of students: 22, 23, 24
↑
22½ not allowed

discrete variables behave like integers
→ there's a step size

continuous - can be any real number

examples: speed

mass
density

note: although height is indeed a continuous variable which has a value which is a real number, practically speaking we usually round our measurement (for example, to the nearest mm) due to

→ limitations of our measuring instrument

→ limitations on object being measured

(radius of a fuzzy tennis ball)

variables

