Week 2 Variables

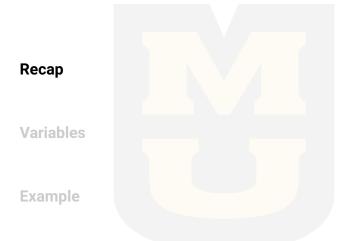
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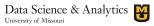


Outline

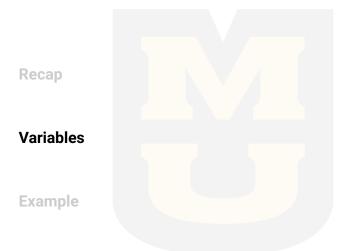


Scientific method

- · Try to be "objective"
- Theories should be falsifiable
- Research should be reproducible
- Knowledge is cumulative and provisional



Outline



Variable

- A constant is a fixed value that never changes.
 - e.g., pi, the number 1, etc.
- A variable is a value that differs across observations.
 - can often be thought of as features or characteristics



Variable values

- Values are measurements (observations) on a given variable
 - e.g., Tracy's height (variable) is 6 '6' (value)
 - e.g., Avery's final race position (variable) is 1 (value)
 - e.g., Cory's skill level in chess (variable) is master (value)
 - e.g., Rory's hometown (variable) is Kansas City (value)
- Different levels of measurement enable different levels of analysis

Levels of measurement

- Nominal
- Ordinal
- Interval
- Ratio



Ratio/numeric/interval

Numeric variables are [or represent] real numbers.

```
foo <- function(x) {
    rnorm(x)
}
foo(5)
## [1] -0.02029768 -0.65959333 -1.03418812 -0.98070149  0.35817576
class(c(1.25, 3.5, 4))
## 'numeric'</pre>
```

Technically, if there's a true zero, then it's considered "ratio". Otherwise, it's "interval".

Ordinal/integer

Ordinal variables are a meaningful sequence of integers.

```
class(1:3)
## 'integer'
```





Categorical/character

Categorical variables are used to represent nominal-level categories.

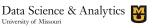
Defining variables

Conceptual definition

A description of a variable's theoretical meaning.

Operational definition

A description of a variable's observable meaning.



Outline



Variables

Example



Size

Define the word size

• Size refers to the dimensions of an object





Class 1



Class 2



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