

Introduction to Statistics I

Textbook: Elementary Statistics (4th Edition, by Navidi and Monk), and Workshop Statistics (4th Edition, by Rossman and Chance).

Previous Lecture

- ◆ Basic idea of stats
- ◆ Simple Random Sampling (SRS),
- ◆ Sampling variability
- ◆ We want unbiased/consistent sampling method



§1.2: Types of Data

Variable (var): property of an obv-unit that can be assigned a **number** or **category**.



Data comes from variables.

E5	A	B	C	Observational Units
	Cats	Weight	Color	Variables
1	Luna	8	brown	
2	Oliver	8.5	orange	
3	Milo	13	white	
4	Bella	11	gray	
5	Leo	10	black	

Spreadsheet showing relationship between obv-units, vars, and data.

Examples:

- ◆ Cost of a textbook



- ◆ Domestic cat lifespan



- ◆ Whether or not a college is private or public

If a property is the same for all obv-units, it's not a var!

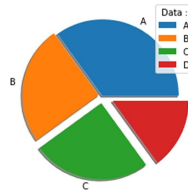
Examples:

- ◆ % of students at each college who graduate in four yrs **is not a var** for students (but it **is a var** for colleges)
- ◆ Whether or not each student graduated in 4 years **is a var** for students (but **not for** colleges)

Variable Types

- ◆ **Quantitative**: Assigns a number (you can do math with it)





♦ **Qualitative:** Assigns a category

If a qualitative var only has two categories (yes/no or either/or), it's called a **binary variable**.

Examples: Let students be the obv-units. Choose quantitative or qualitative for the following?

- ▶ Have you made more outgoing texts or received more incoming texts today, or the same # of each?
- ▶ What is the average duration of calls you've made today?
- ▶ Is your cell phone an iPhone or not?
- ▶ At what time did you receive your first text today?
- ▶ What was the area code to which you made your first call today?



A **research question (RQ)** is a question

- ▶ about *patterns* in a var,
- ▶ which *compares* a var across different groups of obv-units, or
- ▶ looks for a *relationship* between vars.

Examples:

- ▶ Do Le Moyne students text more in the morning or the evening?
- ▶ Do Gen-Z students make fewer calls than Millennials?
- ▶ For Le Moyne students, is there an association between the number of texts per day and the number of calls per day?



Other Distinctions in Book: Ordinal/Nominal vars (e.g., letter grade vs hair color), Continuous/Discrete vars, Ratio level vs Interval level of measurement (e.g., Kelvin vs Fahrenheit).

Activities: 1.2a, 1.2b

What did we learn?

- ♦ **Clarified:** What's a variable (var)?
- ♦ Research Questions (RQ)
- ♦ **Variable Types:** Quantitative/Categorical (possibly Binary)



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Materials for Other Courses Found at **MathTalker.org**