

Week 1 lecture notes - PSYC 3330

August 28-Sept 1, 2017

Why do we need to learn statistics?

- Goals:
 1. to **describe** data (descriptive statistics)
 2. to **make inferences** about a *population*, given data from a *sample* (inferential statistics)

After studying statistics, we learn how to say things like:

- "We are *95% confident* that between 65 and 75 percent of voters will turn out for the upcoming election"
- "The repeated testing group scored *significantly better* than the repeated study group on a subsequent memory test."

What do these things mean, exactly? We'll find out!

What kinds of data do we deal with?

Data are classified by their *scale of measurement*:

Categorical data (also called *discrete*) – measurements consists of separate categories, with no values existing *between* any two categories

1. nominal scale – measurements correspond to categories with different *names*
 - no logical relation *between* categories
 - examples – gender, meal preference, religious preference
2. ordinal scale – measurements correspond to *ordered* categories

- "nominal + ordering"
- examples – position in a race, student classification, level of agreement

Continuous data – measurements take on an infinite set of possible values. Measurements are usually numeric

1. interval scale – measurements consist of numbers where equal differences in measurement reflect equal differences in represented quantity.
 - measurements *don't* represent an amount (or magnitude)
 - example: temperature scale: the difference between 10 deg F and 40 deg F is the same as the difference between 50 deg F and 80 deg F (namely, the latter in each pair is 30 degrees warmer).
 - note: ratios DON'T make sense (40 deg F is not "twice as warm" as 20 deg F..it is not clear what this would even mean).
2. ratio scale – interval scale + an absolute zero point
 - can represent magnitude
 - ratios make sense
 - example: any measurement of a "quantity" (weight, response time, etc.)

class exercise

Identify the scale of measurement for each of the following:

1. ethnic group to which a person belongs
2. number of times a mouse takes a wrong turn in a maze
3. position one finishes in a race
4. a person's score on an IQ test

Displaying data

For now, we'll focus on how to display *frequency* – that is, how often certain measurements show up in the data.

Important – the type of graph used depends on the scale of measurement:
Categorical data:

- bar graph
- pie chart

Continuous data:

- histogram