#5 Measures of Association I (Hypothesis testing)

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Up-to-date

- Fundamentals, R Data, Data wrangling/cleansing, Data Visualization I & II, Data summarization, and MCT&D ✓
- HW #2 done ✓
  - Better?
- Study group? Office hours?

Links to Use

- Canvas chat for attendance
- PollEv for live anonymous comments during lab
- Survey to share topics/phenomena/data you'd like us to work throughout the course when learning R

PollEv.com/ietchacq372

Z and T-tests

Used for hypothesis testing under normality assumption: $\sim$ evaluate if results/expectations from a test are valid (or at least, not refutable with the data at hand...)

One-sample: determine if sample mean is equal/different from a hypothesized value

Two-sample: determine if two sample means are equal/different

Difference btn Z- and T-test

Test null hypothesis with ... if:

Z-test $\rightarrow$ population variance is **known**; sample size is **large** (standard > 30)

T-test $\rightarrow$ population variance is **unknown**; sample size is **small**

Paired/Dependent vs. Unpaired/Independent T-test

Paired samples t-test (Dependent samples t-test): comparing the means of two variables for **dependent/related samples** (usually a single group)

Unpaired samples t-test (Independent samples t-test): comparing the means of two variables for **independent/unrelated** samples

Z-test in R

Default arguments of `z.test()` function from `BSDA` package

```
z.test(x, # for one-sample test only one object
       y, # you can add second sample for 2 sample test
       alternative='two.sided', # default 2 sided, other options: "less", "greater"
       mu=0, # true value of the mean set to 0 by default
       sigma.x=NULL, # population sd of first sample
       sigma.y=NULL, # if you have 2, population sd of second sample
       conf.level=.95, # 0.95 default, set your desired conf. interval here
       ...)
```

T-test in R

Default arguments of `t.test()` function from `stats` base `R` package

```
t.test(x, # for one-sample test only one object
       y = NULL, # one sample is default, but you can add second sample for 2 sample test
       alternative = "two.sided", # other options: "less", "greater"
       mu = 0, # true value of the mean set to 0
       paired = FALSE, # other option: TRUE
       var.equal = FALSE, # other option: TRUE
       conf.level = 0.95, # 0.95 default, set your desired conf. interval here
       ...)
```

HW #3 posted, deadline next week

Doing exactly what we did but with variables of your choice

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