

WAL Data Analysis

```
usethis::use_git_config(user.name = "hanastepnick", user.email = "hana.stepnick@duke.edu")
```

```
library(tidyverse)
```

```
## -- Attaching packages ----- tidyverse 1.3.0 --
```

```
## v tibble 3.0.3      v purrr 0.3.4
## v tidyr  1.1.1      v dplyr 1.0.1
## v readr  1.3.1      v forcats 0.5.0
```

```
## -- Conflicts ----- tidyverse_conflicts() --
```

```
## x lubridate::as.difftime() masks base::as.difftime()
## x lubridate::date()        masks base::date()
## x dplyr::filter()          masks stats::filter()
## x readr::guess_encoding()  masks rvest::guess_encoding()
## x lubridate::intersect()   masks base::intersect()
## x dplyr::lag()              masks stats::lag()
## x purrr::pluck()           masks rvest::pluck()
## x lubridate::setdiff()     masks base::setdiff()
## x lubridate::union()       masks base::union()
```

```
library(infer)
```

```
wal <- read_csv("wal.csv")
```

```
## Parsed with column specification:
```

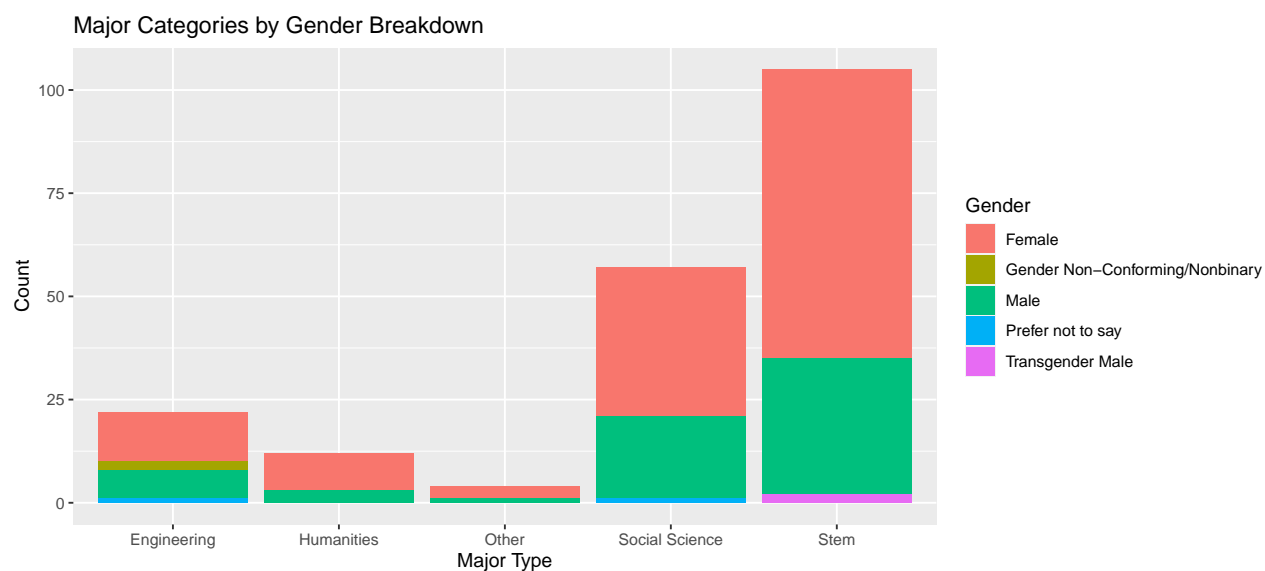
```
## cols(
##   year = col_character(),
##   major = col_character(),
##   major_type = col_character(),
##   hispanic = col_character(),
##   race = col_character(),
##   ask_question = col_double(),
##   answer_question = col_double(),
##   reach_male = col_double(),
##   reach_female = col_double(),
##   lead_group = col_double(),
##   disagree = col_double(),
##   accountable = col_double(),
##   breakdown = col_double(),
##   gender = col_character(),
##   school = col_character()
## )
```

```
majors <- wal %>%
  distinct(major)
```

Distribution of all major breakdowns:

```
ggplot(data = wal, mapping = aes(x = major_type, fill = gender)) +
  geom_bar() +
```

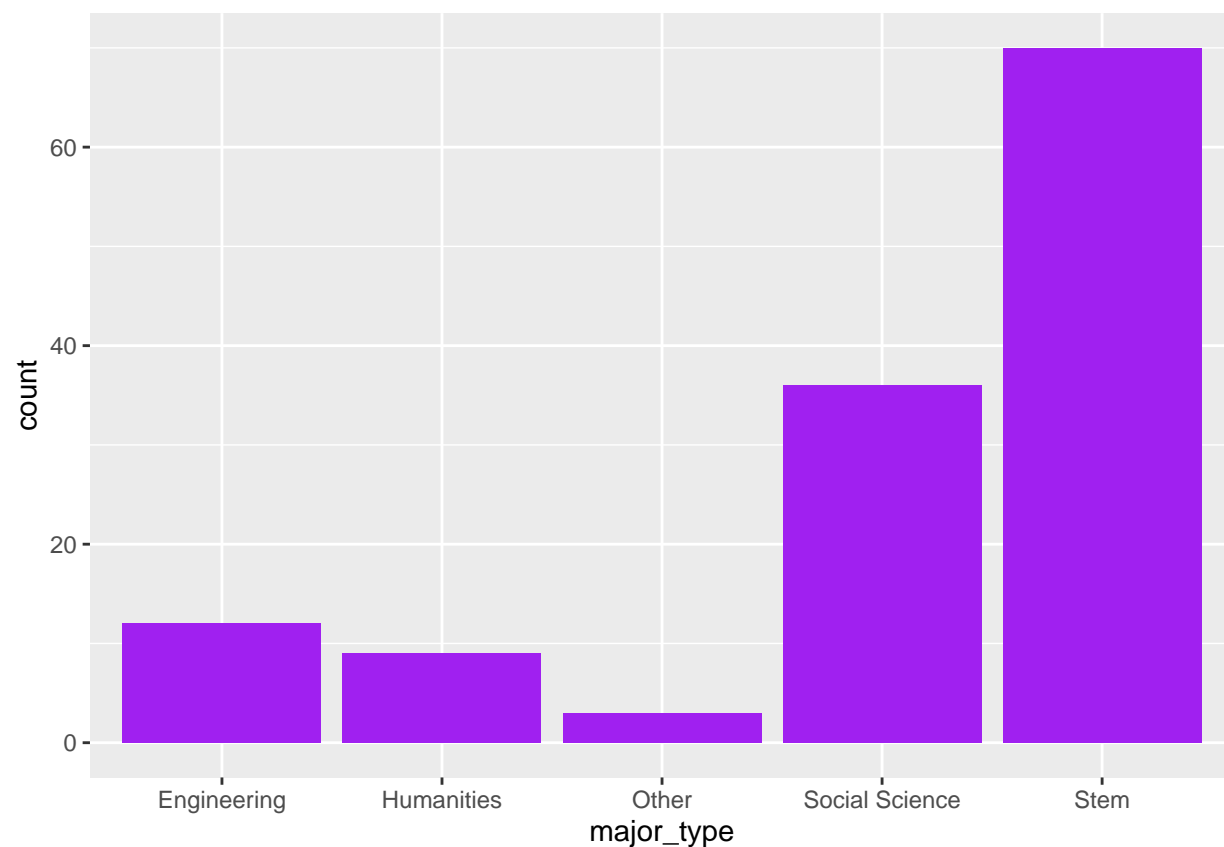
```
labs(title = "Major Categories by Gender Breakdown", x = "Major Type", y = "Count", fill = "Gender")
```



Distribution of major breakdowns for females:

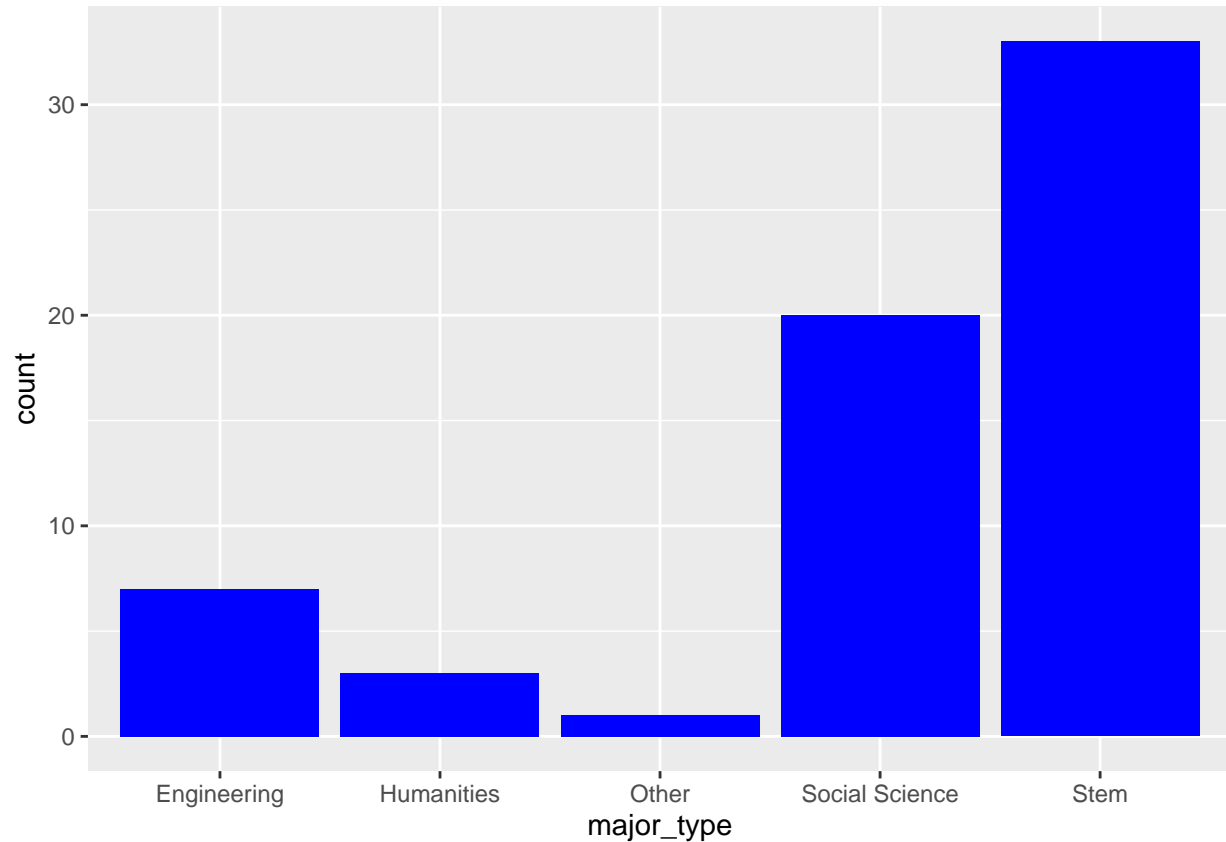
```
wal_female <- wal %>%
  filter(gender == "Female")

ggplot(data = wal_female, mapping = aes(x = major_type)) +
  geom_bar(fill = "purple")
```



Distribution of major breakdowns for males:

```
wal_male <- wal %>%  
  filter(gender == "Male")  
  
ggplot(data = wal_male, mapping = aes(x = major_type)) +  
  geom_bar(fill = "blue")
```



Asking question:

```
mean(wal_female$ask_question, na.rm = FALSE)
```

```
## [1] 3.646154
```

```
mean(wal_male$ask_question, na.rm = FALSE)
```

```
## [1] 3.71875
```

```
wal_male_female <- wal %>%  
  filter(gender == "Female" | gender == "Male")
```

```
t_ask <- wal_male_female %>%  
  t_test(ask_question ~ gender,  
    order = c("Female", "Male"),  
    alternative = "less",  
    conf_int = FALSE)
```

```
t_ask
```

```
## # A tibble: 1 x 4
```

```
##   statistic t_df p_value alternative
```

```
##      <dbl> <dbl>      <dbl> <chr>
## 1      -0.420  113.      0.338 less
```

Answering question:

```
mean(wal_female$answer_question, na.rm = FALSE)
```

```
## [1] 3.338462
```

```
mean(wal_male$answer_question, na.rm = FALSE)
```

```
## [1] 3.609375
```

```
t_answer <- wal_male_female %>%
  t_test(answer_question ~ gender,
    order = c("Female", "Male"),
    alternative = "less",
    conf_int = FALSE)
t_answer
```

```
## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##       <dbl> <dbl>   <dbl> <chr>
## 1      -1.54  115.   0.0634 less
```

Reach out to male prof:

```
mean(wal_female$reach_male, na.rm = FALSE)
```

```
## [1] 3.469231
```

```
mean(wal_male$reach_male, na.rm = FALSE)
```

```
## [1] 4.34375
```

```
t_reach_male <- wal_male_female %>%
  t_test(reach_male ~ gender,
    order = c("Female", "Male"),
    alternative = "less",
    conf_int = FALSE)
t_reach_male
```

```
## # A tibble: 1 x 4
##   statistic t_df      p_value alternative
##       <dbl> <dbl>   <dbl> <chr>
## 1      -5.78  152. 0.0000000208 less
```

Reach out to female prof:

```
mean(wal_female$reach_female, na.rm = FALSE)
```

```
## [1] 4.376923
```

```
mean(wal_male$reach_female, na.rm = FALSE)
```

```
## [1] 4.359375
```

```
t_reach_female <- wal_male_female %>%
  t_test(reach_female ~ gender,
    order = c("Male", "Female"),
    alternative = "less",
```

```
      conf_int = FALSE)
t_reach_female
```

```
## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1    -0.122 105.   0.451 less
```

Comfort with leading a group:

```
mean(wal_female$lead_group, na.rm = FALSE)
```

```
## [1] 3.884615
```

```
mean(wal_male$lead_group, na.rm = FALSE)
```

```
## [1] 3.75
```

```
t_lead <- wal_male_female %>%
  t_test(lead_group ~ gender,
        order = c("Male", "Female"),
        alternative = "less",
        conf_int = FALSE)
t_lead
```

```
## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1    -0.856 108.   0.197 less
```

Comfort with disagreeing with group:

```
mean(wal_female$disagree, na.rm = FALSE)
```

```
## [1] 3.623077
```

```
mean(wal_male$disagree, na.rm = FALSE)
```

```
## [1] 3.546875
```

```
t_disagree <- wal_male_female %>%
  t_test(disagree ~ gender,
        order = c("Male", "Female"),
        alternative = "less",
        conf_int = FALSE)
t_disagree
```

```
## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1    -0.445 116.   0.329 less
```

Comfort with keeping others accountable:

```
mean(wal_female$accountable, na.rm = FALSE)
```

```
## [1] 3.353846
```

```
mean(wal_male$accountable, na.rm = FALSE)
```

```
## [1] 3.375
```

```
t_accountable <- wal_male_female %>%
  t_test(accountable ~ gender,
    order = c("Female", "Male"),
    alternative = "less",
    conf_int = FALSE)
t_accountable
```

```
## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##       <dbl> <dbl>   <dbl>   <chr>
## 1    -0.122  132.    0.452 less
```

Perceptions of major breakdowns:

```
wal_stem <- wal %>%
  filter(major_type == "Stem")

mean(wal_stem$breakdown, na.rm = FALSE)
```

```
## [1] 5.028571
```

```
wal_humanities <- wal %>%
  filter(major_type == "Humanities")

mean(wal_humanities$breakdown, na.rm = FALSE)
```

```
## [1] 5.083333
```

```
wal_social_science <- wal %>%
  filter(major_type == "Social Science")

mean(wal_social_science$breakdown, na.rm = FALSE)
```

```
## [1] 4.947368
```

```
wal_engineering <- wal %>%
  filter(major_type == "Engineering")

mean(wal_engineering$breakdown, na.rm = FALSE)
```

```
## [1] 4.136364
```

```
wal_stem_engineering <- wal %>%
  filter(major_type == "Engineering" | major_type == "Stem")

mean(wal_stem_engineering$breakdown, na.rm = FALSE)
```

```
## [1] 4.874016
```

Engineering vs SS Gender Breakdown:

```
wal_engineering_ss <- wal %>%
  filter(major_type == "Engineering" | major_type == "Social Science")
```

```
t_engineering_ss_breakdown <- wal_engineering_ss %>%
  t_test(breakdown ~ major_type,
    order = c("Engineering", "Social Science"),
    alternative = "less",
    conf_int = FALSE)
```

```
t_engineering_ss_breakdown
```

```
## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl>   <dbl> <chr>
## 1    -2.79  52.1 0.00363 less
```

Trinity vs. Pratt analyses:

Trinity:

```
trinity_female <- wal %>%
  filter(school == "Trinity") %>%
  filter(gender == "Female")
```

```
trinity_male <- wal %>%
  filter(school == "Trinity") %>%
  filter(gender == "Male")
```

```
mean(trinity_female$ask_question, na.rm = FALSE)
```

```
## [1] 3.655462
```

```
mean(trinity_male$ask_question, na.rm = FALSE)
```

```
## [1] 3.719298
```

```
wal_trinity <- wal %>%
  filter(school == "Trinity") %>%
  filter(gender == "Male" | gender == "Female")
```

```
t_ask_trinity <- wal_trinity %>%
  t_test(ask_question ~ gender,
        order = c("Female", "Male"),
        alternative = "less",
        conf_int = FALSE)
```

```
t_ask_trinity
```

```
## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl>   <dbl> <chr>
## 1   -0.353  100.   0.362 less
```

```
mean(trinity_female$answer_question, na.rm = FALSE)
```

```
## [1] 3.319328
```

```
mean(trinity_male$answer_question, na.rm = FALSE)
```

```
## [1] 3.614035
```

```
t_answer_trinity <- wal_trinity %>%
  t_test(answer_question ~ gender,
        order = c("Female", "Male"),
        alternative = "less",
        conf_int = FALSE)
```

```
t_answer_trinity
```

```
## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1    -1.61  104.  0.0555 less

mean(trinity_female$reach_male, na.rm = FALSE)

## [1] 3.420168

mean(trinity_male$reach_male, na.rm = FALSE)

## [1] 4.45614

t_reachmale_trinity <- wal_trinity %>%
  t_test(reach_male ~ gender,
    order = c("Female", "Male"),
    alternative = "less",
    conf_int = FALSE)

t_reachmale_trinity

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1    -7.20  155.  1.20e-11 less

mean(trinity_female$reach_female, na.rm = FALSE)

## [1] 4.361345

mean(trinity_male$reach_female, na.rm = FALSE)

## [1] 4.473684

t_reachfemale_trinity <- wal_trinity %>%
  t_test(reach_female ~ gender,
    order = c("Female", "Male"),
    alternative = "less",
    conf_int = FALSE)

t_reachfemale_trinity

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1    -0.827  102.  0.205 less

mean(trinity_female$lead_group, na.rm = FALSE)

## [1] 3.957983

mean(trinity_male$lead_group, na.rm = FALSE)

## [1] 3.701754

t_leadgroup_trinity <- wal_trinity %>%
  t_test(lead_group ~ gender,
    order = c("Male", "Female"),
    alternative = "less",
    conf_int = FALSE)
```



```

t_leadgroup_trinity

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##       <dbl> <dbl>   <dbl> <chr>
## 1      -1.63  98.0  0.0533 less
mean(trinity_female$disagree, na.rm = FALSE)

## [1] 3.655462
mean(trinity_male$disagree, na.rm = FALSE)

## [1] 3.526316
t_disagree_trinity <- wal_trinity %>%
  t_test(disagree ~ gender,
    order = c("Male", "Female"),
    alternative = "less",
    conf_int = FALSE)

t_disagree_trinity

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##       <dbl> <dbl>   <dbl> <chr>
## 1      -0.736 107.   0.232 less
mean(trinity_female$accountable, na.rm = FALSE)

## [1] 3.378151
mean(trinity_male$accountable, na.rm = FALSE)

## [1] 3.421053
t_accountable_trinity <- wal_trinity %>%
  t_test(accountable ~ gender,
    order = c("Female", "Male"),
    alternative = "less",
    conf_int = FALSE)

t_accountable_trinity

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##       <dbl> <dbl>   <dbl> <chr>
## 1      -0.237 125.   0.406 less
Pratt:
pratt_female <- wal %>%
  filter(school == "Pratt") %>%
  filter(gender == "Female")

pratt_male <- wal %>%
  filter(school == "Pratt") %>%
  filter(gender == "Male")

```

```

mean(pratt_female$ask_question, na.rm = FALSE)

## [1] 3.545455
mean(pratt_male$ask_question, na.rm = FALSE)

## [1] 3.714286
wal_pratt <- wal %>%
  filter(school == "Pratt") %>%
  filter(gender == "Male" | gender == "Female")

t_ask_pratt <- wal_pratt %>%
  t_test(ask_question ~ gender,
        order = c("Female", "Male"),
        alternative = "less",
        conf_int = FALSE)

t_ask_pratt

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1    -0.271  11.0   0.396 less
mean(pratt_female$answer_question, na.rm = FALSE)

## [1] 3.545455
mean(pratt_male$answer_question, na.rm = FALSE)

## [1] 3.571429
t_answer_pratt <- wal_pratt %>%
  t_test(answer_question ~ gender,
        order = c("Female", "Male"),
        alternative = "less",
        conf_int = FALSE)

t_answer_pratt

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1   -0.0408   8.95   0.484 less
mean(pratt_female$reach_male, na.rm = FALSE)

## [1] 4
mean(pratt_male$reach_male, na.rm = FALSE)

## [1] 3.428571
t_reachmale_pratt <- wal_pratt %>%
  t_test(reach_male ~ gender,
        order = c("Male", "Female"),
        alternative = "less",
        conf_int = FALSE)

```

```

t_reachmale_pratt

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##       <dbl> <dbl>   <dbl> <chr>
## 1    -0.848  10.6   0.208 less

mean(pratt_female$reach_female, na.rm = FALSE)

## [1] 4.545455

mean(pratt_male$reach_female, na.rm = FALSE)

## [1] 3.428571

t_reachfemale_pratt <- wal_pratt %>%
  t_test(reach_female ~ gender,
        order = c("Male", "Female"),
        alternative = "less",
        conf_int = FALSE)

t_reachfemale_pratt

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##       <dbl> <dbl>   <dbl> <chr>
## 1    -1.72   9.61  0.0592 less

mean(pratt_female$lead_group, na.rm = FALSE)

## [1] 3.090909

mean(pratt_male$lead_group, na.rm = FALSE)

## [1] 4.142857

t_leadgroup_pratt <- wal_pratt %>%
  t_test(lead_group ~ gender,
        order = c("Female", "Male"),
        alternative = "less",
        conf_int = FALSE)

t_leadgroup_pratt

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##       <dbl> <dbl>   <dbl> <chr>
## 1    -1.63   8.17  0.0705 less

mean(pratt_female$disagree, na.rm = FALSE)

## [1] 3.272727

mean(pratt_male$disagree, na.rm = FALSE)

## [1] 3.714286

t_disagree_pratt <- wal_pratt %>%
  t_test(disagree ~ gender,
        order = c("Female", "Male"),

```

```

        alternative = "less",
        conf_int = FALSE)

t_disagree_pratt

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1    -0.664  8.47  0.262 less

mean(pratt_female$accountable, na.rm = FALSE)

## [1] 3.090909

mean(pratt_male$accountable, na.rm = FALSE)

## [1] 3

t_accountable_pratt <- wal_pratt%>%
  t_test(accountable ~ gender,
        order = c("Male", "Female"),
        alternative = "less",
        conf_int = FALSE)

t_accountable_pratt

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1    -0.156  6.30  0.441 less

Stem:

stem_female <- wal %>%
  filter(major_type == "Stem") %>%
  filter(gender == "Female")

stem_male <- wal %>%
  filter(major_type == "Stem") %>%
  filter(gender == "Male")

mean(stem_female$ask_question, na.rm = FALSE)

## [1] 3.7

mean(stem_male$ask_question, na.rm = FALSE)

## [1] 3.454545

wal_stem <- wal %>%
  filter(major_type == "Stem") %>%
  filter(gender == "Male" | gender == "Female")

t_ask_stem <- wal_stem %>%
  t_test(ask_question ~ gender,
        order = c("Male", "Female"),
        alternative = "less",
        conf_int = FALSE)

```

```
t_ask_stem

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##     <dbl> <dbl>   <dbl> <chr>
## 1     -1.03  56.5    0.155 less

mean(stem_female$answer_question, na.rm = FALSE)
```

```
## [1] 3.4

mean(stem_male$answer_question, na.rm = FALSE)
```

```
## [1] 3.272727

t_answer_stem <- wal_stem %>%
  t_test(answer_question ~ gender,
    order = c("Male", "Female"),
    alternative = "less",
    conf_int = FALSE)
```

```
t_answer_stem

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##     <dbl> <dbl>   <dbl> <chr>
## 1     -0.529  60.6    0.299 less

mean(stem_female$reach_male, na.rm = FALSE)
```

```
## [1] 3.371429

mean(stem_male$reach_male, na.rm = FALSE)
```

```
## [1] 4.424242

t_reachmale_stem <- wal_stem %>%
  t_test(reach_male ~ gender,
    order = c("Female", "Male"),
    alternative = "less",
    conf_int = FALSE)
```

```
t_reachmale_stem

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##     <dbl> <dbl>   <dbl> <chr>
## 1     -5.09  83.0 0.00000108 less

mean(stem_female$reach_female, na.rm = FALSE)
```

```
## [1] 4.485714

mean(stem_male$reach_female, na.rm = FALSE)
```

```
## [1] 4.30303

t_reachfemale_stem <- wal_stem %>%
  t_test(reach_female ~ gender,
    order = c("Male", "Female"),
```

```

        alternative = "less",
        conf_int = FALSE)

t_reachfemale_stem

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##       <dbl> <dbl>   <dbl> <chr>
## 1    -0.918  45.0   0.182 less
mean(stem_female$lead_group, na.rm = FALSE)

## [1] 3.957143
mean(stem_male$lead_group, na.rm = FALSE)

## [1] 3.515152
t_leadgroup_stem <- wal_stem %>%
  t_test(lead_group ~ gender,
        order = c("Male", "Female"),
        alternative = "less",
        conf_int = FALSE)

t_leadgroup_stem

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##       <dbl> <dbl>   <dbl> <chr>
## 1    -2.01  54.3   0.0248 less
mean(stem_female$disagree, na.rm = FALSE)

## [1] 3.657143
mean(stem_male$disagree, na.rm = FALSE)

## [1] 3.454545
t_disagree_stem <- wal_stem %>%
  t_test(disagree ~ gender,
        order = c("Male", "Female"),
        alternative = "less",
        conf_int = FALSE)

t_disagree_stem

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##       <dbl> <dbl>   <dbl> <chr>
## 1    -0.839  58.1   0.203 less
mean(stem_female$accountable, na.rm = FALSE)

## [1] 3.485714
mean(stem_male$accountable, na.rm = FALSE)

## [1] 3.454545

```

```
t_accountable_stem <- wal_stem %>%
  t_test(accountable ~ gender,
    order = c("Male", "Female"),
    alternative = "less",
    conf_int = FALSE)
```

```
t_accountable_stem
```

```
## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1    -0.138  74.2  0.445 less
```

Social Science:

```
ss_female <- wal %>%
  filter(major_type == "Social Science") %>%
  filter(gender == "Female")
```

```
ss_male <- wal %>%
  filter(major_type == "Social Science") %>%
  filter(gender == "Male")
```

```
mean(ss_female$ask_question, na.rm = FALSE)
```

```
## [1] 3.305556
```

```
mean(ss_male$ask_question, na.rm = FALSE)
```

```
## [1] 4.05
```

```
wal_ss <- wal %>%
  filter(major_type == "Social Science") %>%
  filter(gender == "Male" | gender == "Female")
```

```
t_ask_ss <- wal_ss %>%
  t_test(ask_question ~ gender,
    order = c("Female", "Male"),
    alternative = "less",
    conf_int = FALSE)
```

```
t_ask_ss
```

```
## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1    -2.66  39.7 0.00557 less
```

```
mean(ss_female$answer_question, na.rm = FALSE)
```

```
## [1] 3.027778
```

```
mean(ss_male$answer_question, na.rm = FALSE)
```

```
## [1] 4.05
```

```
t_answer_ss <- wal_ss %>%
  t_test(answer_question ~ gender,
    order = c("Female", "Male"),
```

```

        alternative = "less",
        conf_int = FALSE)

t_answer_ss

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##       <dbl> <dbl>   <dbl> <chr>
## 1      -3.44  36.3 0.000733 less
mean(ss_female$reach_male, na.rm = FALSE)

## [1] 3.388889
mean(ss_male$reach_male, na.rm = FALSE)

## [1] 4.65
t_reachmale_ss <- wal_ss %>%
  t_test(reach_male ~ gender,
        order = c("Female", "Male"),
        alternative = "less",
        conf_int = FALSE)

t_reachmale_ss

## # A tibble: 1 x 4
##   statistic t_df      p_value alternative
##       <dbl> <dbl>   <dbl> <chr>
## 1      -6.00  52.5 0.0000000929 less
mean(ss_female$reach_female, na.rm = FALSE)

## [1] 4.138889
mean(ss_male$reach_female, na.rm = FALSE)

## [1] 4.7
t_reachfemale_ss <- wal_ss %>%
  t_test(reach_female ~ gender,
        order = c("Female", "Male"),
        alternative = "less",
        conf_int = FALSE)

t_reachfemale_ss

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##       <dbl> <dbl>   <dbl> <chr>
## 1      -2.93  53.4 0.00249 less
mean(ss_female$lead_group, na.rm = FALSE)

## [1] 3.916667
mean(ss_male$lead_group, na.rm = FALSE)

## [1] 3.9

```



```

t_leadgroup_ss <- wal_ss %>%
  t_test(lead_group ~ gender,
         order = c("Male", "Female"),
         alternative = "less",
         conf_int = FALSE)

t_leadgroup_ss

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1 -0.0725 36.1 0.471 less

mean(ss_female$disagree, na.rm = FALSE)

## [1] 3.722222

mean(stem_male$disagree, na.rm = FALSE)

## [1] 3.454545

t_disagree_ss <- wal_ss %>%
  t_test(disagree ~ gender,
         order = c("Male", "Female"),
         alternative = "less",
         conf_int = FALSE)

t_disagree_ss

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1 -0.255 41.7 0.400 less

mean(ss_female$accountable, na.rm = FALSE)

## [1] 3.277778

mean(ss_male$accountable, na.rm = FALSE)

## [1] 3.5

t_accountable_ss <- wal_ss %>%
  t_test(accountable ~ gender,
         order = c("Female", "Male"),
         alternative = "less",
         conf_int = FALSE)

t_accountable_ss

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1 -0.662 43.7 0.256 less

Humanities:

hum_female <- wal %>%
  filter(major_type == "Humanities") %>%

```

```

filter(gender == "Female")

hum_male <- wal %>%
  filter(major_type == "Humanities") %>%
  filter(gender == "Male")

mean(hum_female$ask_question, na.rm = FALSE)

## [1] 4.333333

mean(hum_male$ask_question, na.rm = FALSE)

## [1] 5

wal_hum <- wal %>%
  filter(major_type == "Humanities") %>%
  filter(gender == "Male" | gender == "Female")

t_ask_hum <- wal_hum %>%
  t_test(ask_question ~ gender,
    order = c("Female", "Male"),
    alternative = "less",
    conf_int = FALSE)

t_ask_hum

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1    -2.83     8  0.0111 less

mean(hum_female$answer_question, na.rm = FALSE)

## [1] 3.777778

mean(hum_male$answer_question, na.rm = FALSE)

## [1] 4.333333

t_answer_hum <- wal_hum %>%
  t_test(answer_question ~ gender,
    order = c("Female", "Male"),
    alternative = "less",
    conf_int = FALSE)

t_answer_hum

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1    -1.13   7.10  0.149 less

mean(hum_female$reach_male, na.rm = FALSE)

## [1] 3.666667

mean(hum_male$reach_male, na.rm = FALSE)

## [1] 4

```

```

t_reachmale_hum <- wal_hum %>%
  t_test(reach_male ~ gender,
    order = c("Female", "Male"),
    alternative = "less",
    conf_int = FALSE)

t_reachmale_hum

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1      -1.     8  0.173 less
mean(hum_female$reach_female, na.rm = FALSE)

## [1] 4.222222
mean(hum_male$reach_female, na.rm = FALSE)

## [1] 4.666667
t_reachfemale_hum <- wal_hum %>%
  t_test(reach_female ~ gender,
    order = c("Female", "Male"),
    alternative = "less",
    conf_int = FALSE)

t_reachfemale_hum

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1    -1.11  3.98  0.165 less
mean(hum_female$lead_group, na.rm = FALSE)

## [1] 3.777778
mean(hum_male$lead_group, na.rm = FALSE)

## [1] 4.333333
t_leadgroup_hum <- wal_hum %>%
  t_test(lead_group ~ gender,
    order = c("Female", "Male"),
    alternative = "less",
    conf_int = FALSE)

t_leadgroup_hum

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1   -0.731  3.30  0.257 less
mean(hum_female$disagree, na.rm = FALSE)

## [1] 3.222222

```

```

mean(stem_male$disagree, na.rm = FALSE)

## [1] 3.454545

t_disagree_hum <- wal_hum %>%
  t_test(disagree ~ gender,
    order = c("Female", "Male"),
    alternative = "less",
    conf_int = FALSE)

t_disagree_hum

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1     -1.14  3.76  0.161 less

mean(hum_female$accountable, na.rm = FALSE)

## [1] 3

mean(hum_male$accountable, na.rm = FALSE)

## [1] 3.333333

t_accountable_hum <- wal_hum %>%
  t_test(accountable ~ gender,
    order = c("Female", "Male"),
    alternative = "less",
    conf_int = FALSE)

t_accountable_hum

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1    -0.632   8.  0.272 less

```

Breaking down social sciences: pub pol versus econ

Public Policy:

```

pp_female <- wal %>%
  filter(major == "Public Policy") %>%
  filter(gender == "Female")

pp_male <- wal %>%
  filter(major == "Public Policy") %>%
  filter(gender == "Male")

mean(pp_female$ask_question, na.rm = FALSE)

## [1] 3.611111

mean(pp_male$ask_question, na.rm = FALSE)

## [1] 4

wal_pp <- wal %>%
  filter(major == "Public Policy") %>%

```

```
filter(gender == "Male" | gender == "Female")
```

```
t_ask_pp <- wal_pp %>%  
  t_test(ask_question ~ gender,  
         order = c("Female", "Male"),  
         alternative = "less",  
         conf_int = FALSE)
```

```
t_ask_pp
```

```
## # A tibble: 1 x 4  
##   statistic t_df p_value alternative  
##       <dbl> <dbl>   <dbl> <chr>  
## 1    -0.529  3.50    0.314 less
```

```
mean(pp_female$answer_question, na.rm = FALSE)
```

```
## [1] 3.166667
```

```
mean(pp_male$answer_question, na.rm = FALSE)
```

```
## [1] 4
```

```
t_answer_pp <- wal_pp %>%  
  t_test(answer_question ~ gender,  
         order = c("Female", "Male"),  
         alternative = "less",  
         conf_int = FALSE)
```

```
t_answer_pp
```

```
## # A tibble: 1 x 4  
##   statistic t_df p_value alternative  
##       <dbl> <dbl>   <dbl> <chr>  
## 1    -1.86  4.33    0.0656 less
```

```
mean(pp_female$reach_male, na.rm = FALSE)
```

```
## [1] 3.444444
```

```
mean(pp_male$reach_male, na.rm = FALSE)
```

```
## [1] 4.75
```

```
t_reachmale_pp <- wal_pp %>%  
  t_test(reach_male ~ gender,  
         order = c("Female", "Male"),  
         alternative = "less",  
         conf_int = FALSE)
```

```
t_reachmale_pp
```

```
## # A tibble: 1 x 4  
##   statistic t_df p_value alternative  
##       <dbl> <dbl>   <dbl> <chr>  
## 1    -3.94  8.40    0.00195 less
```

```
mean(pp_female$reach_female, na.rm = FALSE)
```

```
## [1] 4.333333
mean(pp_male$reach_female, na.rm = FALSE)
```

```
## [1] 4.75
t_reachfemale_pp <- wal_pp %>%
  t_test(reach_female ~ gender,
        order = c("Female", "Male"),
        alternative = "less",
        conf_int = FALSE)
```

```
t_reachfemale_pp
```

```
## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1    -1.35  6.64  0.111 less
mean(pp_female$lead_group, na.rm = FALSE)
```

```
## [1] 4
mean(pp_male$lead_group, na.rm = FALSE)
```

```
## [1] 3.5
t_leadgroup_pp <- wal_pp %>%
  t_test(lead_group ~ gender,
        order = c("Male", "Female"),
        alternative = "less",
        conf_int = FALSE)
```

```
t_leadgroup_pp
```

```
## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1    -0.951  3.65  0.200 less
mean(pp_female$disagree, na.rm = FALSE)
```

```
## [1] 3.944444
mean(stem_male$disagree, na.rm = FALSE)
```

```
## [1] 3.454545
t_disagree_pp <- wal_pp %>%
  t_test(disagree ~ gender,
        order = c("Male", "Female"),
        alternative = "less",
        conf_int = FALSE)
```

```
t_disagree_pp
```

```
## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1    -1.27  3.61  0.139 less
```

```

mean(pp_female$accountable, na.rm = FALSE)

## [1] 3.277778
mean(pp_male$accountable, na.rm = FALSE)

## [1] 3.25
t_accountable_pp <- wal_pp %>%
  t_test(accountable ~ gender,
    order = c("Male", "Female"),
    alternative = "less",
    conf_int = FALSE)

t_accountable_pp

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1 -0.0313  3.49  0.488 less

Economics:
econ_female <- wal %>%
  filter(major == "Economics") %>%
  filter(gender == "Female")

econ_male <- wal %>%
  filter(major == "Economics") %>%
  filter(gender == "Male")

mean(econ_female$ask_question, na.rm = FALSE)

## [1] 2.5
mean(econ_male$ask_question, na.rm = FALSE)

## [1] 4
wal_econ <- wal %>%
  filter(major == "Economics") %>%
  filter(gender == "Male" | gender == "Female")

t_ask_econ <- wal_econ %>%
  t_test(ask_question ~ gender,
    order = c("Female", "Male"),
    alternative = "less",
    conf_int = FALSE)

t_ask_econ

## # A tibble: 1 x 4
##   statistic t_df p_value alternative
##   <dbl> <dbl> <dbl> <chr>
## 1 -3.24  14. 0.00296 less

mean(econ_female$answer_question, na.rm = FALSE)

## [1] 2.25

```

```
mean(econ_male$answer_question, na.rm = FALSE)
```

```
## [1] 3.625
```

```
t_answer_econ <- wal_econ %>%  
  t_test(answer_question ~ gender,  
    order = c("Female", "Male"),  
    alternative = "less",  
    conf_int = FALSE)
```

```
t_answer_econ
```

```
## # A tibble: 1 x 4  
##   statistic t_df p_value alternative  
##   <dbl> <dbl> <dbl> <chr>  
## 1     -2.34  13.3  0.0178 less
```

```
mean(econ_female$reach_male, na.rm = FALSE)
```

```
## [1] 3.375
```

```
mean(econ_male$reach_male, na.rm = FALSE)
```

```
## [1] 4.5
```

```
t_reachmale_econ <- wal_econ %>%  
  t_test(reach_male ~ gender,  
    order = c("Female", "Male"),  
    alternative = "less",  
    conf_int = FALSE)
```

```
t_reachmale_econ
```

```
## # A tibble: 1 x 4  
##   statistic t_df p_value alternative  
##   <dbl> <dbl> <dbl> <chr>  
## 1     -1.99   8.74  0.0393 less
```

```
mean(econ_female$reach_female, na.rm = FALSE)
```

```
## [1] 3.875
```

```
mean(econ_male$reach_female, na.rm = FALSE)
```

```
## [1] 4.5
```

```
t_reachfemale_econ <- wal_econ %>%  
  t_test(reach_female ~ gender,  
    order = c("Female", "Male"),  
    alternative = "less",  
    conf_int = FALSE)
```

```
t_reachfemale_econ
```

```
## # A tibble: 1 x 4  
##   statistic t_df p_value alternative  
##   <dbl> <dbl> <dbl> <chr>  
## 1     -1.08   8.64  0.155 less
```



```
mean(econ_female$lead_group, na.rm = FALSE)
```

```
## [1] 3.75
```

```
mean(econ_male$lead_group, na.rm = FALSE)
```

```
## [1] 3.625
```

```
t_leadgroup_econ <- wal_econ %>%  
  t_test(lead_group ~ gender,  
         order = c("Male", "Female"),  
         alternative = "less",  
         conf_int = FALSE)
```

```
t_leadgroup_econ
```

```
## # A tibble: 1 x 4  
##   statistic t_df p_value alternative  
##       <dbl> <dbl>   <dbl> <chr>  
## 1    -0.306  13.6    0.382 less
```

```
mean(econ_female$disagree, na.rm = FALSE)
```

```
## [1] 3.75
```

```
mean(stem_male$disagree, na.rm = FALSE)
```

```
## [1] 3.454545
```

```
t_disagree_econ <- wal_econ %>%  
  t_test(disagree ~ gender,  
         order = c("Male", "Female"),  
         alternative = "less",  
         conf_int = FALSE)
```

```
t_disagree_econ
```

```
## # A tibble: 1 x 4  
##   statistic t_df p_value alternative  
##       <dbl> <dbl>   <dbl> <chr>  
## 1    -0.832  12.7    0.210 less
```

```
mean(econ_female$accountable, na.rm = FALSE)
```

```
## [1] 3.75
```

```
mean(econ_male$accountable, na.rm = FALSE)
```

```
## [1] 3.25
```

```
t_accountable_econ <- wal_econ %>%  
  t_test(accountable ~ gender,  
         order = c("Male", "Female"),  
         alternative = "less",  
         conf_int = FALSE)
```

```
t_accountable_econ
```

```
## # A tibble: 1 x 4  
##   statistic t_df p_value alternative
```

```
##      <dbl> <dbl>   <dbl> <chr>
## 1    -0.695  11.4    0.251 less
```