

Assignment 6: Who busts the Mythbusters?

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2022-03-07

Exercise 1

```
print(experimental_data)
```

```
## # A tibble: 50 x 3
##   subject_id yawn  group
##         <dbl> <chr> <chr>
## 1           1 no    Control
## 2           2 no    Control
## 3           3 no    Treatment
## 4           4 no    Control
## 5           5 no    Treatment
## 6           6 no    Control
## 7           7 no    Treatment
## 8           8 no    Treatment
## 9           9 yes   Treatment
## 10          10 no    Control
## # ... with 40 more rows
```

explanatory : group response : yawn

Exercise 2

What quantity should we use or compute in order to build the null distribution? :The average difference in fraction_yawned between the treatment and control groups

Exercise 3

```
yawn_null <- experimental_data %>%
  specify(<yawn> ~ <group>, success = "...") %>%
```

Exercise 4

```
hypothesize(null = "independence")
```

Exercise 5

```
generate(reps = "10000", type = "permute")
```

Exercise 6

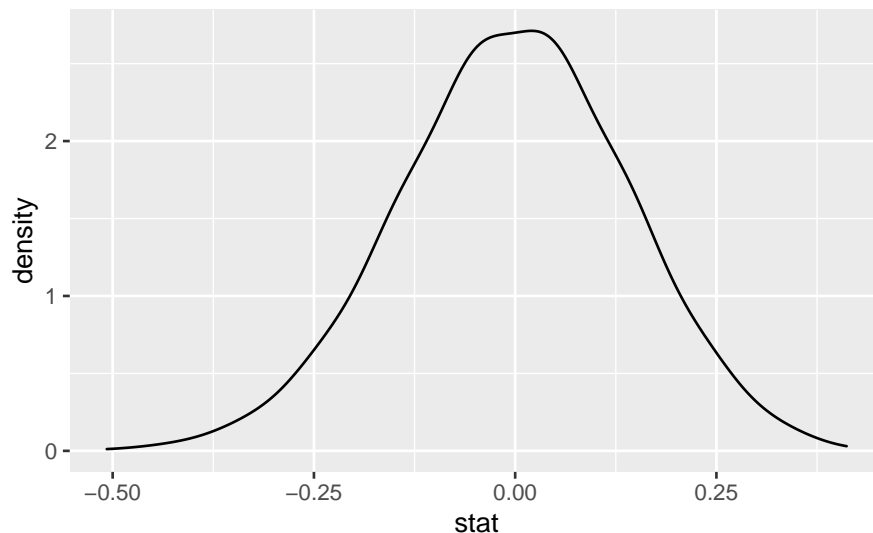
```
calculate(stat = "diff in props", order = c("Treatment", "Control"))
```

Exercise 7

```
yawn_null <- experimental_data %>%  
  specify(formula = yawn ~ group, success = "yes") %>%  
  hypothesize(null = "independence") %>%  
  generate(reps = "10000", type = "permute") %>%  
  calculate(stat = "diff in props", order = c("Treatment", "Control"))
```

Exercise 8

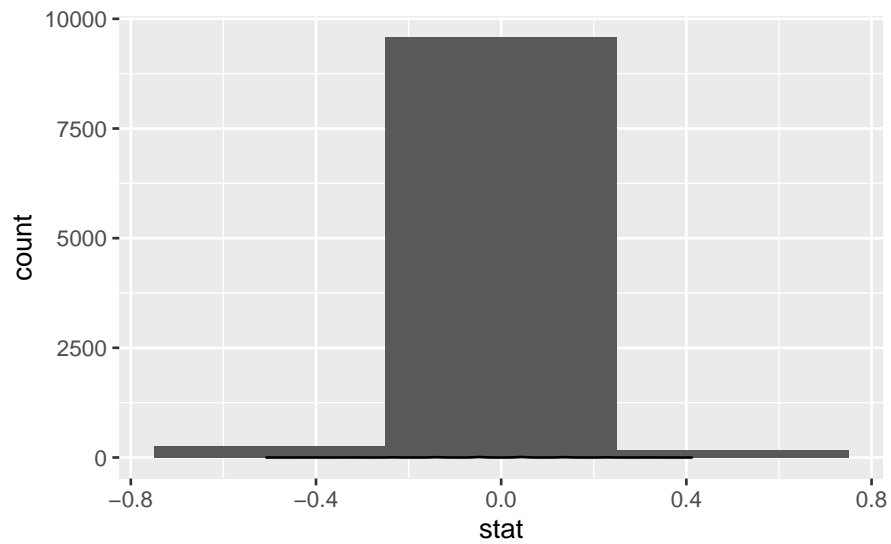
```
ggplot(yawn_null, bins=10)+  
  geom_density(mapping = aes(x=stat), adjust = 5)
```



Where is the center of each distribution? - 0.00 Does this make sense given what you know about the data (i.e. would you expect the difference of proportions to be centered on this value)? - no

Exercise 9

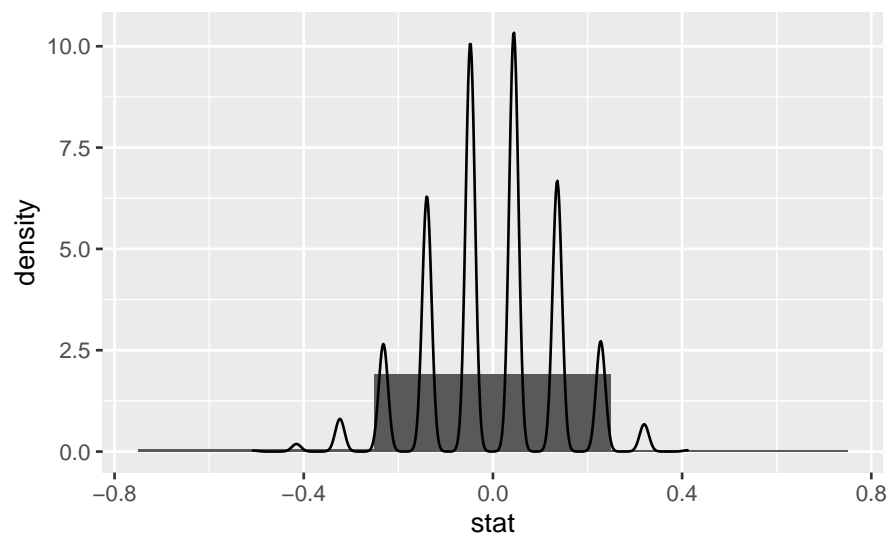
```
ggplot(data = yawn_null) +  
  geom_histogram(mapping = aes(x=stat), binwidth = 0.5) +  
  geom_density(mapping = aes(x=stat))
```



Does the plot look okay, or do you notice a problem? there is a problem

Exercise 10

```
ggplot(data = yawn_null) +
  geom_histogram(mapping = aes(x=stat, y= ..density..), binwidth = 0.5) +
  geom_density(mapping = aes(x=stat))
```



Exercise 11

```
yawn_obs_stat <- experimental_data %>%
  specify(formula = yawn ~ group, success = "yes") %>%
  calculate(stat = "diff in props", order = c("Treatment", "Control"))
yawn_null %>%
  visualize() +
  shade_p_value(obs_stat = yawn_obs_stat, direction = "right")
```

